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**Department of Energy**  
Washington, DC 20585

September 30, 2014

Via email

Re: HQ-2014-01279-F

This is the final response to the request for information that you sent to the Department of Energy (DOE) under the Freedom of Information Act (FOIA), 5 U.S.C. § 552. You requested each response to a Question for the Record (QFR) provided to Congress by the Department of Energy or its components.

In an August 1, 2014 email to Ms. I. Cristina Abello of my office, you clarified that you are requesting responses from January 1, 2012 to the present.

Your request was assigned to the Office of Congressional and Intergovernmental Affairs (CI) to conduct a search of its files. CI started its search on July 17, 2014, which is the cut-off date for responsive documents.

CI identified fifty-two (52) documents that are responsive to your request. For your information, document 32 contains incorrect page numbering. The documents are being released in full as described in the accompanying index.

The adequacy of the search may be appealed within 30 calendar days from your receipt of this letter pursuant to 10 C.F.R. § 1004.8. Appeals should be addressed to Director, Office of Hearings and Appeals, HG-1, L'Enfant Plaza, U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, D.C. 20585-1615. The written appeal, including the envelope, must clearly indicate that a FOIA appeal is being made. The appeal must contain all the elements required by 10 C.F.R. § 1004.8, including a copy of the determination letter. Thereafter, judicial review will be available to you in the Federal District Court either (1) in the district where you reside, (2) where you have your principal place of business, (3) where DOE's records are situated, or (4) in the District of Columbia.

The FOIA provides for the assessment of fees for the processing of requests. *See* 5 U.S.C. § 552(a)(4)(A)(i); *see also* 10 C.F.R. § 1004.9(a). In our July 11, 2014 letter, you were categorized as an "other" requester. In this category, you are entitled to two free hours of search time and 100 free



pages. The search time did not exceed two hours and you will be receiving documents in electronic form, thus no fees will be charged for processing your request.

If you have any questions about the processing of the request or this letter, you may contact Ms. I. Cristina Abello at:

MA-90/ Forrestal Building  
1000 Independence Avenue, S.W.  
Washington, DC 20585  
(202) 586-5955

I appreciate the opportunity to assist you with this matter.

Sincerely,

A handwritten signature in blue ink, appearing to read "Alex Morris", is written over the printed name.

Alexander C. Morris  
FOIA Officer  
Office of Information Resources

Enclosures

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**Request #: HQ-2014-01279-F**

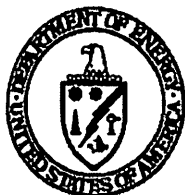
**Final response for request for the following:**

**Each response to a Question for the Record (QFR) provided to Congress by the Department of Energy or its components.**

The Office of Congressional and Intergovernmental Affairs conducted a search of its files and identified fifty-two (52) documents responsive to your request.

- Fifty-two (52) documents are being released in their entirety.
- Document 32 is missing page numbers “2” and “3” and has an extra page number “7” after page 5.





## Department of Energy

Washington, DC 20585

March 27, 2012

The Honorable Jeff Bingaman  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On January 31, 2012, Howard Gruenspecht, Acting Administrator, Energy Information Administration, testified regarding the U.S. and global energy outlook for 2012.

Enclosed are the answers to 19 questions submitted by Senators Cantwell and Murkowski to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Brad Crowell", is written over a horizontal line.

Brad Crowell  
Deputy Assistant Secretary  
for Senate Affairs  
Congressional and Intergovernmental  
Affairs

Enclosures



## QUESTION FROM SENATOR CANTWELL

**Q1a. Historical vs. Future Coal Prices:** According to Energy Information Administration (EIA) data (Annual Energy Review 2011, Table 7.9), coal prices in the United States rose by more than 5 percent annually, on average-- from \$18.93 to \$32.2 per ton-- between 2000 and 2010. The EIA's Annual Energy Outlook 2012 Early Release projects rising U.S. coal production and exports, but average annual coal price increases of just 0.9% over the period 2009-2035.

In EIA's analysis, what factors contribute to this significant departure from historical trends in coal prices?

**A1a.** The key reason coal prices do not continue to rise as rapidly in our projections as they have in recent years is that we assume that the coal mining productivity will not continue to decline as rapidly as it has in recent years. The sharp increase in coal prices from 2000 to 2010 was due to many factors, including declines in coal mining productivity and the rising costs of mine equipment, parts and supplies, fuel prices, explosives, and, more recently, labor. Between 2000 and 2010, U.S. coal mining productivity declined at an average rate of 2.3 percent per year. However, the recent trend of increasing coal prices and declining coal mining productivity is a departure from longer term trends in the industry. For example, from 1980 through 2000 average U.S. coal prices declined 4.5 percent per year in inflation adjusted dollars, and coal mining productivity increased 6.2 percent per year. We take account of both the short- and long-term productivity trends in the industry when preparing our long-term projections. As a result, in the *Annual Energy Outlook 2012* Early Release Reference case we assume that coal mining productivity continues to decline, but only 1.3 percent per year, just over half the rate of decline seen over the last five to ten years. In the full *Annual Energy Outlook* to be released in the spring of 2012, we will include a sensitivity analysis that examines the impacts of alternative assumptions about coal mining productivity.

## **QUESTION FROM SENATOR CANTWELL**

**Q1b. Historical vs. Future Coal Prices:** According to Energy Information Administration (EIA) data (Annual Energy Review 2011, Table 7.9), coal prices in the United States rose by more than 5 percent annually, on average-- from \$18.93 to \$32.2 per ton-- between 2000 and 2010. The EIA's Annual Energy Outlook 2012 Early Release projects rising U.S. coal production and exports, but average annual coal price increases of just 0.9% over the period 2009-2035.

**Would environmental regulations that effectively limit U.S. coal use to relatively cleaner supplies be likely to increase future coal prices?**

**A1b.** Without details on the environmental regulations envisioned it is difficult to assess their potential impact on coal prices. Generally, regulations that reduce the supply of usable coal would lead to higher coal prices for power plants and other consumers, but the size of the increase would depend on the specifics of the regulations. Conversely, regulations that would lower the demand (i.e., restrictions on power plant use of coal) would decrease the price of coal.

## QUESTION FROM SENATOR CANTWELL

**Q2a. Baseline Projection:** In an investment analysis published one year ago (<http://www.anga.us/media/180381/deutsche%20report-%20nov%202010.pdf>), Deutsche Bank concluded that coal use for electricity production in the United States is likely to decline significantly in coming decades-- from 47 percent in 2009 to 22 percent in 2030. Several factors contribute to coal's decline, including capital cost increases relative to gas, retirement of aging plants, increasingly stringent regulation of criteria pollutants, rising ash disposal costs, and financial barriers due to the regulatory uncertainty associated with greenhouse gas emissions. In contrast, EIA's Annual Energy Outlook 2012 Early Release projects that U.S. aggregate coal use will continue to rise and that coal will still account for 39 percent of U.S. electricity production in 2035.

Does EIA believe the Deutsche Bank analysis is credible? If not, please explain the stark differences between its conclusions and those of EIA.

**A2a.** The Deutsche Bank report *Natural Gas and Renewables, A Secure Low Carbon Energy Plan for the United States (November 2010)*, provides an analysis that is driven by a policy-oriented initiative, specifically the identification of a low cost solution for achieving a 17-percent reduction in overall U.S. greenhouse gas (GHG) emissions by 2020 and an 83-percent reduction by 2050 relative to the 2005 level. A statement to this effect is made at the beginning of their "Key Research Findings" section on page 8 of their report. Those policy goals were not represented in the *Annual Energy Outlook 2012 (AEO2012)* Early Release.

In addition, it appears that some of the assumptions used for Deutsche Bank's analysis may vary substantially from those used by EIA for the *AEO2012* Early Release. For example, in their analyses Deutsche Bank indicates that natural gas prices will remain in a range of \$4.00 to \$8.00 per million Btu in nominal dollars, with perhaps \$6.00 being their primary natural gas prices assumption. In the *AEO2012* Early Release, the nominal price of natural gas at Henry Hub increases from \$4.39 per million Btu in 2010 to \$8.98

per million Btu in 2030 and to \$11.48 per million Btu in 2035. Another important difference between Deutsche Bank's analysis and EIA's *AEO2012* Early Release is the outlook for electricity demand, with Deutsche Bank projecting average electricity demand to increase by 0.5 percent per year between 2009 and 2030 and EIA projecting growth of 1.0 percent per year for this same time period.

In the area of coal-fired generating capacity retirements, Deutsche bank projects 152 gigawatts of capacity retirements (most likely nameplate) by 2030, which is considerably higher than the amount of net summer coal-fired capacity retirements projected in the *AEO2012* Early Release during the years 2011 through 2030. In the Deutsche Bank report, the authors indicate that the costs of some environmental rules not represented in EIA's *AEO2012* Early Release, such as the EPA's recently finalized Mercury and Air Toxics Standards (MATS) and forthcoming EPA rules on cooling water intake and ash disposal were represented in their analyses. EIA plans to represent the new MATS rule in the updated *AEO2012* Reference case scheduled for publication later this year. In our preliminary modeling runs, the representation of the MATS rule does result in some additional retirements of coal-fired generating capacity.

## QUESTION FROM SENATOR CANTWELL

**Q2b. Baseline Projection:** In an investment analysis published one year ago (<http://www.anga.us/media/180381/deutsche%20report-%20nov%202010.pdf>), Deutsche Bank concluded that coal use for electricity production in the United States is likely to decline significantly in coming decades-- from 47 percent in 2009 to 22 percent in 2030. Several factors contribute to coal's decline, including capital cost increases relative to gas, retirement of aging plants, increasingly stringent regulation of criteria pollutants, rising ash disposal costs, and financial barriers due to the regulatory uncertainty associated with greenhouse gas emissions. In contrast, EIA's Annual Energy Outlook 2012 Early Release projects that U.S. aggregate coal use will continue to rise and that coal will still account for 39 percent of U.S. electricity production in 2035.

Does EIA concur with the broad consensus that anticipated plant retirements, increasing regulatory obligations, and higher hurdles to capital finance for new coal plants will have a profound impact on U.S. coal consumption?

**A2b.** While the factors listed above certainly affect the outlook for coal consumption, many other factors also influence the outlook for coal consumption. Forecasts of changes in laws and regulations which are not reflected in EIA's Reference case but may be included in some projections that are part of the "broad consensus" cited in the question can significantly affect future U.S. coal consumption. Other factors such as slow electricity demand growth, competitive natural gas prices, increased competition from renewable energy sources, and rising cost estimates for new coal-fired generating capacity are also key drivers affecting projected coal consumption.



## QUESTION FROM SENATOR CANTWELL

**Q2c. Baseline Projection:** In an investment analysis published one year ago (<http://www.anga.us/media/180381/deutsche%20report-%20nov%202010.pdf>), Deutsche Bank concluded that coal use for electricity production in the United States is likely to decline significantly in coming decades-- from 47 percent in 2009 to 22 percent in 2030. Several factors contribute to coal's decline, including capital cost increases relative to gas, retirement of aging plants, increasingly stringent regulation of criteria pollutants, rising ash disposal costs, and financial barriers due to the regulatory uncertainty associated with greenhouse gas emissions. In contrast, EIA's Annual Energy Outlook 2012 Early Release projects that U.S. aggregate coal use will continue to rise and that coal will still account for 39 percent of U.S. electricity production in 2035.

If EIA does agree with the consensus of plant retirements, increasing regulatory obligations, and higher hurdles to capital finance for new coal plants, what is driving future increases in U.S. coal consumption in EIA's modeling and analysis?

**A2c.** In the *AEO2012* Early Release Reference case, increasing demand for electricity leads to increased generation from all fuels, except petroleum. Between 2010 and 2035, EIA projects an overall increase in U.S. electricity generation of 928 billion kilowatt-hours. By fuel, increased generation from natural gas-fired power plants account for 42 percent of this increase, renewables account for 39 percent, coal accounts for 11 percent, and nuclear accounts for 9 percent. The increase in coal generation comes mainly from increasing output from existing coal plants in the later years of the projections as natural gas prices begin to increase.

## QUESTION FROM SENATOR CANTWELL

**Q2d. Baseline Projection:** In an investment analysis published one year ago (<http://www.anga.us/media/180381/deutsche%20report-%20nov%202010.pdf>), Deutsche Bank concluded that coal use for electricity production in the United States is likely to decline significantly in coming decades-- from 47 percent in 2009 to 22 percent in 2030. Several factors contribute to coal's decline, including capital cost increases relative to gas, retirement of aging plants, increasingly stringent regulation of criteria pollutants, rising ash disposal costs, and financial barriers due to the regulatory uncertainty associated with greenhouse gas emissions. In contrast, EIA's Annual Energy Outlook 2012 Early Release projects that U.S. aggregate coal use will continue to rise and that coal will still account for 39 percent of U.S. electricity production in 2035.

Does EIA work with financial analysts to try to incorporate what the private sector predicts will happen to coal usage?

**A2d.** EIA considers a wide range of information in formulating its projections. In the course of developing our *Annual Energy Outlook* each year, we meet with a wide array of interested groups and analysts to discuss assumptions we plan to make, proposed model changes and review preliminary results. EIA staff and management also participate actively in public meetings and conferences where these issues are discussed by analysts from the private sector and non-governmental organizations. They also keep up with relevant literature from all sources.

Many private sector analyses incorporate assumptions about policy changes that have yet to occur, that are not included in EIA projections. EIA's Reference case projections assume continuation of current laws and regulations. For example, the Deutsche Bank study referred to in an earlier question appears to assume a GHG policy objective as a basis for their projections of the U.S. electricity market, something that is not included in EIA's Reference case analyses.

## QUESTION FROM SENATOR CANTWELL

**Q3a. Effects of Coal Exports:** The 2011 Annual Energy Outlook shows U.S. exports of coal increasing annually by 1.8%, from 1.51 quadrillion Btu in 2009 to 3.24 quadrillion Btu in 2035. In contrast, U.S. production of coal is only projected to increase by 0.3% annually, from 21.63 quadrillion Btu in 2009 to 23.51 quadrillion Btu in 2035. This suggests that exports will account for over 13% of coal production by 2035.

Could coal prices increase substantially more than projected if world demand increases faster than expected? If exports were to increase annually at twice the projected rate such that 20% of U.S. coal production was exported by 2035, roughly in what range would coal prices be?

**A3a.** Increased exports of U.S. coal could lead to higher U.S. coal prices, depending on a number of factors including the availability of other fuels and/or technologies to generate electricity. EIA includes a representation of the international market for coal trade in our analyses, but the projected increase in exports of coal leads to only a slight increase in regional coal prices.

## QUESTION FROM SENATOR CANTWELL

- Q3b. Effects of Coal Exports:** The 2011 Annual Energy Outlook shows U.S. exports of coal increasing annually by 1.8%, from 1.51 quadrillion Btu in 2009 to 3.24 quadrillion Btu in 2035. In contrast, U.S. production of coal is only projected to increase by 0.3% annually, from 21.63 quadrillion Btu in 2009 to 23.51 quadrillion Btu in 2035. This suggests that exports will account for over 13% of coal production by 2035.

As the rest of the world consumes an increasing percentage of U.S. coal, will coal act more like a fungible commodity subject to prices set by the world market, causing U.S. coal prices to increase? Would this also cause more volatility in U.S. coal prices?

- A3b.** The relationship between the prices of internationally traded coal and domestic U.S. coal prices is not well established, so it is difficult to predict how future trends in international coal prices will affect U.S. coal prices. The swings in international coal prices are a relatively recent phenomenon, with generally flat to declining trends in inflation adjusted prices prevailing from the 1980's through the early 2000's.

In general, there are two distinct markets for international coal trade: one representing steam or thermal coal primarily for electricity generation and a second market representing coking coal used in the manufacture steel. In terms of thermal coal markets, it is difficult to see a strong relationship between international and U.S. domestic coal prices at this time because the share of U.S. steam coal exported is so small. In the *AEO2012* Early Release, U.S. exports of steam coal rise from 26 million short tons in 2010 to 51 million short tons in 2035, or 3 percent and 5 percent of overall U.S. thermal coal production, respectively.

In contrast, there does appear to be a relatively strong relationship between the international and domestic prices for coking coal. However, for this market the export

share of total U.S. coking coal production is much higher, amounting to 74 percent in 2010 and rising to 85 percent in 2035. Also, while U.S. steam coal faces substantial competition from other fuels such as natural gas, renewables, and nuclear for electricity generation, substitutions for coking coal in steelmaking are more limited.

## QUESTION FROM SENATOR CANTWELL

**Q4a. Regulations and the Cost of Coal:** In 2011 the Environmental Protection Agency (EPA) issued a number of new rules. As these policies go into effect, the price of coal-fired generation is expected to rise. The National Research Council's 2010 report "The Hidden Costs of Energy" showed that the average additional cost of coal generation due to emissions of SO<sub>2</sub>, NO<sub>x</sub>, and particulate matter was 3.2 cents per kilowatt-hour in 2005 and will decrease to roughly 1.7 cents per kilowatt-hour by 2030.

To what extent are these externalities incorporated into EIA's models? How do the costs of reducing these emissions from recent regulations compare?

**A4a.** It is our understanding that the additional costs per kilowatthour that the National Resource Council (NRC) calculated for emissions of SO<sub>2</sub>, NO<sub>x</sub>, and particulates from coal-fired generating capacity refer to the cost of externalities such as the impact on health, environment, and security. These types of non-market costs are not accounted for in EIA's models because they do not generally enter into the dispatch decisions of electric systems operators. We do explicitly represent the capital and operating costs associated with meeting new environmental regulations, but those are not directly comparable to the non-market costs discussed in the NRC report cited in the question.



## **QUESTION FROM SENATOR CANTWELL**

**Q4b. Regulations and the Cost of Coal:** In 2011 the Environmental Protection Agency (EPA) issued a number of new rules. As these policies go into effect, the price of coal-fired generation is expected to rise. The National Research Council's 2010 report "The Hidden Costs of Energy" showed that the average additional cost of coal generation due to emissions of SO<sub>2</sub>, NO<sub>x</sub>, and particulate matter was 3.2 cents per kilowatt-hour in 2005 and will decrease to roughly 1.7 cents per kilowatt-hour by 2030.

**If the additional cost of coal generation estimated by the NRC were included in EIA's modeling how would that change the estimate for future coal consumption and the price through 2035?**

**A4b. Estimating the value of externalities is very difficult and often subjective. Externalities exist for the use of most fuel types, including natural gas, petroleum, and renewable fuels. EIA does not attempt to quantify externalities in its analyses. Generally speaking, inclusion of externality values reflecting social rather than private costs would result in higher projected electricity prices and lower projected coal consumption.**

## QUESTION FROM SENATOR CANTWELL

**Q4c. Regulations and the Cost of Coal:** In 2011 the Environmental Protection Agency (EPA) issued a number of new rules. As these policies go into effect, the price of coal-fired generation is expected to rise. The National Research Council's 2010 report "The Hidden Costs of Energy" showed that the average additional cost of coal generation due to emissions of SO<sub>2</sub>, NO<sub>x</sub>, and particulate matter was 3.2 cents per kilowatt-hour in 2005 and will decrease to roughly 1.7 cents per kilowatt-hour by 2030.

Which regulations, in addition to the Mercury and Air Toxics Standards (MATS), will be included in AEO 2012? Will disposal costs due to coal ash regulations be included? Which Boiler MACT rule is used? The one finalized last year that is currently binding or the proposed rule issued in December?

**A4c.** The Cross State Air Pollution Rule was modeled in the *AEO2012* Early Release, but the December enactment of the MATS did not leave sufficient time for inclusion. The full *AEO2012* to be released in spring will include the MATS rule by requiring that all coal plants install either a Flue Gas Desulfurization (FGD) scrubber or a Direct Sorbent Injection (DSI) system in order to continue operating beyond 2012. The potential additional costs associated with stricter ash disposal requirements that have not yet been established in final regulations are not addressed in our Reference case projections.

The Industrial Boiler MACT Rule was most recently proposed in December 2011, after our cutoff date for the AEO2012. In any event, EIA's Reference case generally reflects final rules, not proposed ones. The prior version of the Boiler MACT finalized and then stayed by EPA last year is also not included.

#### **QUESTION FROM SENATOR CANTWELL**

**Q4d. Regulations and the Cost of Coal:** In 2011 the Environmental Protection Agency (EPA) issued a number of new rules. As these policies go into effect, the price of coal-fired generation is expected to rise. The National Research Council's 2010 report "The Hidden Costs of Energy" showed that the average additional cost of coal generation due to emissions of SO<sub>2</sub>, NO<sub>x</sub>, and particulate matter was 3.2 cents per kilowatt-hour in 2005 and will decrease to roughly 1.7 cents per kilowatt-hour by 2030.

Although regulations on greenhouse gas emissions are forthcoming, has EIA attempted to model their effect?

**A4d.** EIA has not explicitly attempted analyze the impact the forthcoming greenhouse gas rules on new plants. In the past we have prepared numerous analyses of legislative proposals to curb emissions of greenhouse gases (GHGs) that are available on our web site.

## QUESTION FROM SENATOR MURKOWSKI

**Q1.** You mention in your report that EIA recognizes that projections of energy markets over a 25-year period are highly uncertain and subject to many events that cannot be foreseen.

What factors impact how these numbers move, and how easy is it to predict those factors?

**A1.** The number of uncertainties involved in projecting long-term energy markets is large, and the degree to which they affect energy markets varies. Readers of the *Annual Energy Outlook* are cautioned that Reference case results should not be viewed in isolation and are encouraged to review the alternative cases included in the full publication. The alternative cases published in the *Annual Energy Outlook* (AEO) provide perspective on the sensitivity of energy market outcomes to differing assumptions in key areas. Recent energy market developments have strongly reinforced the aphorism, 'expect the unexpected'.

The list below categorizes areas of uncertainty and highlights some of the alternative cases that are included in each year's AEO.

- The U.S. economic environment is subject to variation in business cycles and to uncertainty about the pace of long-term economic growth. Low and high economic growth alternatives explore the effects of varying rates of economic growth on energy markets.
- Energy prices can fluctuate rapidly and are sometimes influenced by developments beyond the U.S. (e.g., international economic developments, oil

embargos, natural disasters, other supply disruptions). The AEO includes a set of alternatives featuring low and high world oil prices.

- The future pace of technological change and the resulting effects on energy markets may diverge from what is expected due to varied success in research and development or the potential for disruptive technologies. The AEO looks at the potential effects of different technological paths through cases profiling differing nuclear power costs and life extension alternatives, differing costs for renewable energy technologies, and a suite of cases highlighting a wide range of assumptions about the rate of improvement in energy-using technologies.
- Energy policy changes that depart from current laws or regulations are not included in the AEO Reference case, allowing the case to serve as a baseline for policy analysis. However, a number of additional scenarios relevant to current policy discussions are included in the AEO.
- Exploration and production often leads to changes in estimates of resource availability and/or drilling productivity and cost. The AEO includes alternatives with differing assumptions for oil and gas supply to explore uncertainties in this area.

## QUESTION FROM SENATOR MURKOWSKI

**Q2a-b.** In reviewing EIA's most recent report on the impact of US LNG exports on domestic energy markets, the build-out scenarios appear to be aggressive. Please explain your view on the likelihood of these various scenarios:

In all 16 of EIA's scenarios, your findings about the long-term impact of exports appear to be somewhat minimal, but the conclusions about short-term impact, however, seems quite extreme. I realize that EIA's conclusions may be based on the export schedule it modeled, but could industry respond to such price increases somewhat quickly by producing more gas?

How realistic is EIA's projected short-term price impact given that production will likely increase?

**A2a-b.** The scenarios contained in the report, *Effect of Increased Natural Gas Exports on*

*Domestic Energy Markets*, were specified by DOE's Office of Fossil Energy. EIA has not performed an analysis of the likelihood of these LNG export scenarios. The Office of Fossil Energy has indicated that these scenarios were specified to capture a wide range of possible outcomes. The shorter-term rapid increase in prices shown in the report largely reflects expected increases in production costs due to the production of more natural gas, which occurs relatively quickly. Domestic production increases, on average, from 4 to 12 percent when exports are added. Production costs increase due to the increased demand for equipment (e.g., rigs) and labor to support the necessary drilling, as well as for lease rights.

The shorter-term rapid increase in prices shown in the report largely reflects increases in production costs due to the production of more natural gas, which occurs relatively quickly. Domestic production increases on average from 4 to 12 percent when exports are added. Production costs increase due to the increased demand for equipment (e.g., rigs) and labor to support the necessary drilling, as well as lease rights.



**The projected price impacts associated with the additional exports in the scenarios specified by the Office of Fossil Energy for the study already reflect the expectation of higher natural gas production. Factors that accelerate the need to produce greater volumes will cause prices to rise faster than in the Reference case.**

## QUESTION FROM SENATOR MURKOWSKI

Q2c-d. In reviewing EIA's most recent report on the impact of US LNG exports on domestic energy markets, the build-out scenarios appear to be aggressive. Please explain your view on the likelihood of these various scenarios:

Has Alaska's history of natural gas export significantly impacted Lower 48 natural gas prices?

If Alaska were to significantly increase its natural gas exports, to the order of 4 bcf/day, would EIA forecast any significant impact on Lower 48 natural gas prices?

A2c-d. The scenarios contained in the report, *Effect of Increased Natural Gas Exports on*

*Domestic Energy Markets*, were specified by DOE's Office of Fossil Energy. EIA has not performed an analysis of the likelihood of these LNG export scenarios. The Office of Fossil Energy has indicated that these scenarios were specified to capture a wide range of possible outcomes. The shorter-term rapid increase in prices shown in the report largely reflects expected increases in production costs due to the production of more natural gas, which occurs relatively quickly. Domestic production increases, on average, from 4 to 12 percent when exports are added. Production costs increase due to the increased demand for equipment (e.g., rigs) and labor to support the necessary drilling, as well as for lease rights.

The Alaska and Lower 48 natural gas markets have not been historically linked. Over the years, proposals have been developed for building a pipeline to supply natural gas to the Lower 48 from Alaska. However, this pipeline is not projected by the EIA to be built before 2035 under Reference case conditions (although it is viable under some side cases with higher prices in the Lower 48 States).

EIA has not assessed the economic viability of transporting LNG from Alaska to international markets or the Lower 48 States markets via tanker. Shipment of LNG from the Alaska North Slope may pose significant logistical challenges in terms of tanker access. With the construction of a West Coast liquefaction terminal or with the eventual widening of the Panama Canal, it is possible that exports out of Alaska could compete with Lower 48 LNG exports in Asian markets and thus have an indirect (and likely limited) impact on Lower 48 prices.

## **QUESTION FROM SENATOR MURKOWSKI**

**Q3. Earlier this week, EIA announced that some of the most important data in the latest Annual Energy Review may be flawed and would need to be revised. Do you know the source of that potential error, and how long it may take to correct if the data is indeed inaccurate?**

**A3. We discovered after publication of the Annual Energy Review 2010, that the data in Table 1.14, Fossil Fuel Production on Federally Administered Lands, was incomplete. In reviewing the data, EIA identified the underreporting and, in consultation with the Office of Natural Resource Revenues (ONRR) of the Department of the Interior (DOI), identified further data limitations.**

- The fossil fuel volumes are sales and not production. The data sources are the Form 2014 and the Solid Mineral Production and Royalty Report, which collect information on sales of fossil fuels produced on federal leases. The distinction of sales and production is important because sales exclude production such as lease use and storage volumes. Sales volumes are a lower bound on actual production.**
- The fossil fuel volumes are assigned to the year in which the royalty was paid and not the year the sale took place. For example, if a sale took place in 2007, but ONRR received the royalty payment in 2010, the volume is included in the total sales in 2010.**
- The reported sales volumes are on a fiscal year (FY) and not a calendar year basis. For example, FY 2009 covers the period from October 1, 2008 through September 30, 2009.**

- EIA had been using the ONRR source due to the difficulty of obtaining data for onshore federal lands. EIA has been reporting offshore production data in its petroleum navigator and will continue working with ONRR to improve the reporting of the production data for onshore federal lands for the year in which production occurred and on a calendar year basis as with the rest of the production data.

EIA has worked with ONRR to obtain a complete set of data to update and revise the table. A report entitled *Sales of Fossil Fuels Produced from Federal and Indian Lands, FY 2003 through FY 2011* was published on March 14, 2012. We have also confirmed that the reporting problem that is corrected in the new report was isolated to Table 1.14 in the AER and does not affect any other tables in the AER or any other EIA analyses.

#### QUESTION FROM SENATOR MURKOWSKI

- Q4.** Last year, Administrator Newell testified with regard to Keystone XL that “Whether or not that pipeline exists, one question is whether or not the oil would be produced. That is one question. That study seemed to suggest that it would be produced regardless of whether there was a pipeline, and it would likely be exported to the west, to Asia, as opposed to south to the United States.” Does EIA still agree with each part of that assessment?
- A4.** In his testimony last year, Administrator Newell was referring to a study performed for DOE rather than an EIA analysis. However, EIA’s *Annual Energy Outlook* and *International Energy Outlook* both consider the global balance between liquid fuels supply and demand. In both of those publications, the world oil price is the key determinant of the level of unconventional liquids production, including production from Canada’s oil/tar sands resource. At Reference case oil prices used in recent editions of these publications, production of this resource is expected to increase substantially.



## QUESTION FROM SENATOR MURKOWSKI

**Q5a-b.** In the early release of the latest Annual Energy Outlook, EIA projects that biofuels usage will continue to increase in the United States through 2035 – but only offset roughly 600,000 barrels of liquid fuel demand.

How much biofuel does EIA project we will be using in 2035, on a gallons-per-year basis?

To what extent does EIA project the mandates within the Renewable Fuel Standard will be met? Do you still project a substantial shortfall of cellulosic biofuel?

**A5a-b.** EIA projects in the *AEO2012* Early Release Reference case that 38.3 billion gallons of renewable biofuel will be consumed in 2035. The 600,000 barrels per day (9.2 billion gallons) refers to a statement in the report which says, “In the *AEO2012* Reference case, some of the demand for biofuel, which in 2035 is projected to displace more than 600 thousand barrels per day of demand for other liquid fuels, is as a direct replacement for diesel and gasoline”, (*AEO2012 Early Release Overview*, p.6.). This refers to biofuels that can be used directly (unblended) in vehicles (e.g., biomass-to-liquids and renewable diesel) as opposed to the majority of biofuels that are blended with petroleum first (e.g., ethanol and biodiesel).

EIA projects that the cellulosic biofuel standard will require repeated annual waivers until it can be administratively modified in 2016. The *AEO2012* early release projects that the 16 billion gallons target for cellulosic biofuels established under the renewable fuels standard provisions of the Energy Independence and Security Act of 2007 will be reached sometime after 2030.

## QUESTION FROM SENATOR MURKOWSKI

**Q6a-b.** EIA reports consistently show little to no growth in the hydropower sector. In 2008, the EIA testified before Congress that the Annual Energy Outlook (AEO) forecasts less than 1 GW of new hydropower capacity to be added by 2030. In the 2011 AEO, hydropower is not even included in the discussion with the forecasts for other renewable technologies and the report shows an annual growth rate of only 0.1 percent in net summer capacity through 2035.

Do you believe that the EIA modeling is accurately reflecting the hydropower sector? In 2011 alone, FERC received approximately 610 MW of conventional hydropower applications for original licenses, exemptions and also capacity additions at existing facilities. In my state of Alaska alone, work is proceeding on a 600+ MW new hydropower project. And these statistics do not even include pumped storage, which would double or triple these numbers.

How does the EIA reporting square with these on-the-ground numbers? Is the EIA re-examining the NEMS model and other data to refine and improve its hydro forecasts? And if not, why not?

**A6a-b.** We believe that the EIA modeling of hydropower is consistent with the very slow growth in the industry that has been seen in recent decades. At the end of 2010, conventional hydropower capacity was 78,825 megawatts (MW), essentially unchanged from the 78,562 megawatts in place in 1995. During that same time, although there were more than 2000 hydropower license applications, FERC only approved 82 projects, for 555 MW of capacity. The relatively small number of projects approved reflects both applicants who decided not to pursue projects, as well as projects that FERC disapproved. While the breakdown of these categories is unknown, it is clear that only a small number of license applications lead to installed projects.

The projected hydroelectric capacity additions in the Annual Energy Outlook are based on a number of factors, including expected increases in demand for electricity, the cost and availability of hydro resources, and the cost of alternative sources of generation.

State and Federal incentives are also accounted for, to the extent possible. Current EIA projections show a surplus of generating capacity to meet near-term electricity demand, with little need for additional capacity of any sort through the remainder of this decade.

EIA's projections include all reported, in-service electricity generators greater than 1 MW in capacity, as well as projects greater than 1 MW that are under construction, based on respondent-provided completion dates. Projects not yet under construction are not explicitly included in the forecast. However, additional hydroelectric capacity can be built within the model if it is the most economic alternative to satisfy electricity demand.

EIA is not able to model the electricity markets in Alaska or Hawaii, which depend on energy supply resources and market dynamics that are unlike the inter-connected grids in the contiguous States. Additionally, EIA does not currently project demand for new pumped storage projects.

EIA plans to re-examine and expand its assessment of the cost of conventional hydropower on a site-by-site basis during 2012 using information developed by the Idaho National Laboratory. If this work is completed in time, the results will be incorporated in the *AEO2013*.



## Department of Energy

Washington, DC 20585

May 1, 2012

The Honorable Ed Whitfield  
Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On March 28, 2012, Christopher Smith, Deputy Assistant Secretary for Oil and Natural Gas, Office of Fossil Energy, testified regarding "The American Energy Initiative."

Enclosed is the answer to one question submitted by Representative Burgess to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher Davis", is positioned above the printed name.

Christopher Davis  
Deputy Assistant Secretary for  
Congressional Affairs

Enclosure



## **QUESTION FROM REPRESENTATIVE BURGESS**

**Q1. If the Administration goes ahead and releases reserves from the SPR, what would be the impact on the oil and gas markets if the oil were sold at a fixed price of \$40 per barrel?**

**A1. Such analysis has not been performed. Section 161(e)(1) of the Energy Policy and Conservation Act requires that the Secretary “shall sell petroleum products withdrawn from the Strategic Petroleum Reserve at public sale to the highest qualified bidder . . . .”**



**Department of Energy**  
Washington, DC 20585

June 7, 2012

The Honorable Ben Nelson  
Chairman  
Subcommittee on Strategic Forces  
Committee on Armed Services  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On March 14, 2012, David Huizenga, Senior Advisor for Environmental Management, testified regarding the Fiscal Year 2013 budget request for the Department of Energy's Office of Environmental Management.

Enclosed are the answers to six questions that were submitted by Ranking Member Jeff Sessions to complete Mr. Huizenga's portion of the hearing record. The answers to Administrator D'Agostino's questions will be sent to you under separate cover.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Brad Crowell", is positioned above the typed name.

Brad Crowell  
Principal Deputy Assistant Secretary  
for Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Jeff Sessions, Ranking Member



## **QUESTIONS FROM SENATOR JEFF SESSIONS**

### **Environmental Management**

**Q40(b)** Administrator D'Agostino and Mr. Huizenga, the request for FY13 request for Environmental Management (EM) is \$5.49 billion, almost \$500 million more than the level appropriated in FY12. Given EM funding is a part of security spending, how do you justify large increases for EM and a \$371 million reduction from the funding level planned for FY13 in the FY12 budget for the weapons program? It appears to me that national security requirements are being traded for environmental clean-up.

**A40(b)** The FY 2013 request for the Defense Environmental Cleanup account is \$5.49 billion. This amount includes the \$463 million that would be transferred from the General Fund to be deposited into the Uranium Enrichment Decontamination and Decommissioning Fund--netting to zero in the request. There is no programmatic increase of \$463 million. The total FY 2013 request for the Environmental Management program is \$5.65 billion, which is a reduction of \$60 million from the FY 2012 enacted level of \$5.71 Billion.

**Q41(b)** Administrator D'Agostino and Mr. Huizenga, a January 2012 front page USA Today article on the clean-up project at Hanford painted a very troubling picture of the decade-long, multi-billion dollar symbol of what is wrong with the EM program. According to the article, the Waste Treatment Plant's (WTP) \$12.3 billion price tag is not only triple original estimates but is "well short of what it will cost to address the problems and finish the project." What will it cost and how much more time will it take to finish this project?

**A41(b)** Today, the WTP Project is over 62% complete, and the Department has directed the WTP Project contractor to develop a Baseline Change Proposal projecting the total project costs and schedule for completing the capital project. This proposal should be completed by the fall of 2012. Until we receive the Baseline Change Proposal from the contractor, and conduct our own independent government cost estimate that will serve as the basis for the independent review of that proposal, we are unable to address potential cost and schedule changes. The Department remains committed to working

with Congress and its stakeholders to complete this important project and reduce the risk posed by the tank waste at Hanford.

**Q42(b)** Administrator D'Agostino and Mr. Huizenga, given the complexity of a high-risk one-of-a-kind nuclear facility, why was a design-build approach – which a GAO official quoted as being “good, if you’re building a McDonald’s” – taken?

**A42(b)** DOE selected a design-build approach because it vests a single contractor with the responsibility to design, build and commission the WTP under a single contract. One entity is clearly responsible to assure the adequacy of design to meet project performance expectations; to assure construction meets design specifications; and to demonstrate, through commissioning, that performance expectations are met. Another reason that a design-build strategy was selected was that this approach allowed facilities to be completed and commissioned earlier, meeting stakeholder desires to begin processing waste as soon as possible. At the time the decision was made to apply the design-build strategy to the WTP, no one anticipated that the resolution of the technical issues would be so complex. If the Department were presented with the same decision now with the current level of knowledge, a key consideration would focus on the development of a plan for closing the technical issues and validating design.

**Q43(b)** Administrator D'Agostino and Mr. Huizenga, who is being held accountable for this project?

**A43(b)** Accountability for the successful completion and operation of the WTP Project extends to all levels of the Department of Energy. This project has the attention of and support from the most senior levels in the Department, and I assure you that they have clearly communicated their expectations and hold me and my management team—which



extends down to the Federal Project Director of the WTP—accountable for safely and successfully completing this project.

**Q44(b)** Administrator D'Agostino and Mr. Huizenga, why shouldn't this project be terminated immediately or stopped to evaluate whether the current plan is affordable?

**A44(b)** The safe cleanup of the 56 million gallons of chemical and radioactive waste stored in underground tanks at the Hanford Site in Washington State, only 7 to 10 miles from the Columbia River, is one of the highest priorities for the Office of Environmental Management's mission. This waste, the legacy of the Department's plutonium production mission for the national defense, is highly complex, and is currently stored in tanks that are decades beyond their design life. The Waste Treatment Plant (WTP) Project is the cornerstone of EM's cleanup strategy, and it is of utmost importance that we continue to move forward to get this solution in place and operating to reduce the risk posed by Hanford's tank waste. Today, the WTP Project is over 62% complete, and there is unmistakable physical progress toward accomplishing the tank waste cleanup mission at Hanford.

**Q45(b)** Administrator D'Agostino and Mr. Huizenga, in 2005 Senator Graham was able to speed up clean-up at the Savannah River Site by 23 years and save taxpayers \$16 billion. Section 3116 of the 2005 NDAA illustrates that there are, in fact, vehicles and legislative options for reducing both cost and schedule of environmental clean-up programs. What over the past year has EM done to address the staggering and growing cost of clean-up and what can Congress and the executive branch do to make sure that we get the job done without spending such a staggering amount of taxpayers' dollars?

**A45(b)** The Office of Environmental Management (EM) continues to use a risk-informed decision making process to set priorities and, working with our regulators, establish cleanup standards that are protective of human health and the environment. EM also continues to incorporate efficiencies into the processes used to complete environmental

remediation at all of the DOE sites. This is attained by developing new technologies to address highly complex technical issues and implementing contract strategies that achieve more cost-effective cleanup while maintaining high safety standards.

Section 3116 has saved costs and reduced schedule in the Department's high-level waste tank closure efforts at Savannah River Site (SRS) and Idaho National Laboratory (INL). Using this waste determination process, the Department has closed at INL, 11 large tanks (300,000 gallons) and 4 small tanks (30,000 gallons), and at SRS, low activity radioactive waste is being disposed of as saltstone in on-site vaults and the closure process for the F Tank Farm, specifically, Tanks 18 and 19, began in April 2012.

At Oak Ridge, we have reevaluated the disposition of U-233 at the Oak Ridge National Laboratory. In the first phase of the U-233 project, approximately half of the inventory is being shipped directly without processing to the Nevada National Security Site for disposal or storage for future programmatic use. This alternative strategy significantly reduces the capital asset requirements for the project and is estimated to avoid hundreds of millions of dollars from the previous project cost estimate.

Using funds from the American Recovery and Reinvestment Act of 2009, EM has accelerated decommissioning and deactivation (D&D) of excess facilities and cleanup of contaminated areas to reduce the legacy cleanup from over 900 square miles in 2009 to 318 square miles by the end of FY 2011; significantly below the end of the FY 2011 target of 540 square miles. EM is using cost effective processes such as entombment of reactors to reduce the inventory of excess facilities. The continued management and removal of legacy TRU waste from generator sites will directly support risk reduction and aid in the goal of reducing site footprint.

EM continues to implement sustainable remediation remedies and to explore new technologies that are more effective and efficient. EM is continuing to look at using monitored natural attenuation and enhanced attenuation to remove contaminants from groundwater, therefore eliminating constructing and operating pump and treat systems, which generally must operate for long periods of time, thereby reducing costs. EM is also using new types of impermeable barriers to reduce the spread of contamination in the subsurface, further reducing the cost to remediate groundwater. At West Valley, New York, an 860 foot long and 30 foot deep impermeable barrier was installed to prevent the spread of strontium. At SRS, a gate and funnel type barrier was used to funnel the groundwater into an area where it can be treated. At Hanford, EM is using a new treatment material (resin) to remove chromium from the groundwater. The use of this new resin removes about 15 times the amount of chromium, therefore, reducing the operating costs associated with resin change out.

For high level waste, EM is investing in technologies to improve glass formulation to increase the amount of radionuclides that can be incorporated into glass at Hanford's Waste Treatment Plant (WTP). EM is also developing a small column ion exchange (SCIX) to be coupled with a rotary micro-filter to pretreat the radioactive tank waste at SRS and Hanford. Since 2008, EM has been employing at SRS, the Caustic-Side Solvent Extraction process for removing radioactive cesium-137 from waste in a modular unit, and will be implementing it at full scale at the SRS's Salt Waste Processing Facility. The next generation chemistry promises to be transformational in its impact, especially when coupled with SCIX. These technology advances accelerate waste processing to shorten the schedule and reduce cost.

The EM program is large and complex. Many of the problems require unique solutions to address the cleanup. EM will continue to find innovative ways to address these problems, reduce risks, maintain safety and be protective of human health and environment while continuing to explore innovative ways to reduce the cost.



**Department of Energy**  
Washington, DC 20585

June 8, 2012

The Honorable Jeff Bingaman  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On March 29, 2012, Dr. Howard Gruenspecht, Acting Administrator, Energy Information Administration, testified regarding current and near-term future price expectations and trends for motor gasoline and other refined petroleum fuels.

Enclosed are responses to 14 questions that you and Senators Cantwell, Landrieu, and Murkowski submitted to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher Davis", is written over the typed name.

Christopher Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Office of Congressional and Intergovernmental  
Affairs

Enclosures



**Questions for the record for Dr. Gruenspecht,  
Acting Administrator and Deputy Administrator, Energy Information Administration,  
U.S. Department of Energy**

**Hearing before the Senate Energy and Natural Resources Committee – March 29<sup>th</sup>, 2012**

**QUESTIONS FROM CHAIRMAN BINGAMAN**

- Q1.** Senator Coons (at the 116 minute mark), cited a report from DBL investors that 94.6% of federal subsidies over the last century have gone to oil and gas production, and nuclear energy. He then asked Dr. Yergin if that data suggested anything to him about what the federal government's path forward should be given its pursuit of an "all of the of the above" energy strategy and move away from high gasoline prices. Dr. Yergin deferred to Dr. Gruenspecht, mentioning that EIA had conducted a study that had reached a much different conclusion.

The report to which Dr. Yergin referred was published by EIA on August 1, 2011 and entitled "Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2010." As I understand it, the EIA report is much more limited in scope than the DBL Investors report because it only focuses on one year of federal support for energy. Further, the year on which it focuses, 2010, contains significant "one-time" spending on energy as a result of the Recovery Act. As a result this "snapshot" data appears to me to be not at all representative of historical U.S. energy policy.

Dr. Gruenspecht, do you view 2010 as an anomaly or the norm (in the context of the past century) in terms of federal spending on renewable energy and biofuels production? Can you offer EIA's assumptions about federal spending on renewable energy and advanced biofuels in the current Annual Energy Outlook? Are these projected to increase or decrease? By how much? How will that affect the deployment of renewable energy systems and the availability of advanced biofuels?

- A1.** EIA's report, "Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2010," indicated that many federal provisions will sunset soon, which makes 2010 an unusual year in the context of the past several decades.

Measuring federal support to various forms of energy can be significantly affected by the criteria used to identify subsidies and the time horizon one chooses. EIA's study provided a snapshot for the FY2010 and was "limited to subsidies that are provided by

the federal government, provide a financial benefit with an identifiable federal budget impact, and are specifically targeted at energy markets.”

The report identified the unusual number of relatively recent Congressional actions that increased subsidies in some areas, “A key factor in the increased support for conservation programs, end-use technologies and renewables was the passage of several pieces of legislation responding to the recent financial crisis and subsequent economic downturn, particularly the American Recovery and Reinvestment Act of 2009 (ARRA) and the Energy Improvement and Extension Act (EIEA). Some of the ARRA-related programs that account for a large portion of the growth in subsidies and support between FY 2007 and FY 2010 (Table ES2) are temporary and the subsidies associated with them are scheduled to phase out over the next few years (see “Energy Provisions Included in Legislation Responding to the Recent Financial Crisis”). Other recent legislation impacting energy subsidies included the Food, Conservation, and Energy Act of 2008, which provided significant new subsidies to biofuels (primarily ethanol and biodiesel) producers, and the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010, which extended the sunset dates for several tax expenditure programs, as well as the grant program for qualifying renewables.”

EIA’s Annual Energy Outlook 2012 (AEO2012), makes projections assuming that statutory provisions affecting energy production terminate on their scheduled sunset dates. This approach enables EIA’s Reference case to be used as a baseline for analyses that consider the effect of changes to current laws and policies. In particular, blending tax credits for most biofuels end in 2011, the production tax credits for wind expires in

2012, and credits for other renewable sources end in 2013, resulting in a significant change in the rate of renewable power builds, particularly wind power. For biofuels, the expiration of blending tax credits does not significantly alter projected biofuels production since increasing biofuels use is still mandated by the federal renewable fuel standard.

The AEO2012 Early Release reference case forecasts that the share of U.S. electricity generation coming from renewable fuels (including conventional hydropower) will increase from 10 percent in 2010 to 16 percent in 2035. This increase in generation is expected to be led by non-hydro renewables. Similarly, liquid biofuels are expected to increase from 1 percent of domestic energy consumption in 2010 to 4 percent of domestic energy consumption in 2035. The outlook for cellulosic biofuels has become less optimistic: "Although liquids production from many sources is higher in *AEO2012* than was projected in the *AEO2011* Reference case, production of advanced cellulosic biofuels is lower. Over the past three consecutive years, production goals for cellulosic ethanol in the EISA2007 RFS have not been achieved. While EIA has projected a need for waivers in all Reference case projections since the passage of the EISA2007 RFS, EIA's view of technology development and market penetration rates for cellulosic biofuel technologies has grown somewhat more pessimistic in *AEO2012*."



## QUESTIONS FROM SENATOR CANTWELL

### 1. OIL COMPANY PROFITS

From 2003 to 2008, oil revenues for the top five oil companies increased by 86 percent while profits increased by 66 percent. Yet oil output by the five major oil companies over this same time period declined by more than 7 percent, from 9.85 million to 9.12 million barrels per day. These additional profits were not earned as a result of additional production effort on the part of the oil companies but due almost entirely to the record crude oil prices, which are set in the world oil marketplace.

Combined, it's been literally a trillion-dollar decade for the oil and gas giants. From 2002 to 2011, ExxonMobil gained \$310 billion, Shell \$204 billion, Chevron \$152 billion and BP \$147 billion -- despite its loss year because of the 2010 Gulf of Mexico oil spill. As the price of oil rose, company revenues and profits soared with ExxonMobil eventually becoming the most profitable corporation in the history of American industry.

That's a really good return for an era of volatile, but significantly lower oil prices than we are seeing today and are likely to see in the future.

**Q1a.** Given that the 5 major oil companies made over a trillion dollars in profits over the last decade -- and that's profits, not revenues—and their cost of production is still around \$11 per barrel, what do you estimate their profits will total over the next decade?

**A1a.** EIA does not estimate oil company profits. As your question suggests, profits are sensitive to oil prices, but many of the major oil companies also have extensive refinery operations and have a diversified portfolio, including natural gas. Developments affecting those markets, as well as the costs of upstream and downstream operations and the terms of production sharing agreements and other contractual arrangements between resource-owning countries and major oil companies are other key factors that will drive future profits.

## QUESTIONS FROM SENATOR CANTWELL

**Q1b.** And when it comes to gas prices, many of my constituents complain about oil company profits. From an oil producer's perspective, how much profit is there in each gallon of \$4 gas?

**A1b.** The price of crude oil directly affects oil producers' profits and returns to owners of oil resources. There are times when the wholesale price of gasoline falls below the price of various crude oils, and oil producers and resource owners still receive the price of crude oil for revenue. Refinery profits are generated from product revenues less crude oil costs and other feedstock, energy use, and operating costs. As indicated in my testimony, the high price for gasoline stems mainly from the high price for crude oil, not refining profits.

One misconception about oil industry profitability is that high profits in the upstream portion of the business (e.g., crude oil production) subsidize the downstream refining and marketing sectors. Within the United States (U.S.), about 45 percent of refining capacity is run by companies that are independent of any upstream business (e.g., Valero), about 40 percent is operated by integrated oil and gas companies (e.g., ExxonMobil), and the remaining 15 percent is associated with joint ventures (e.g., Motiva, a joint venture between Shell and Saudi Arabia Refining Inc.). After ConocoPhillips finishes splitting its company into two separate companies (one that produces oil and one that refines and markets products), only 30 percent of refining capacity will be associated with integrated companies and 55 percent will be operated by independent refiners. That is, most U.S. refining capacity must survive financially on its own. However, even within integrated

companies, refining and marketing are run as independent businesses from the upstream business.

## QUESTIONS FROM SENATOR CANTWELL

**Q1c.** The tightening supply of oil and reduced spare capacity has been cited as the major driver for today's price increases. Based off our experience of rising oil prices from 2003 to 2008, how will this market adjust to this tightening supply?

**A1c.** Between 2003 and 2008 total world liquid fuels consumption increased by an average 1.1 million barrels per day (bbl/d) each year, with China accounting for 41 percent of the increase. During this 5-year period total production from non-OPEC countries increased by an average of only 0.18 million bbl/d, compared with an average annual growth of 0.77 million bbl/d over the previous 5 years. Consequently, a greater reliance was put on OPEC-member countries to increase production, which contributed to a decline in surplus crude oil production capacity from an estimated average of 5.4 million bbl/d in 2002 to 1.4 million bbl/d in 2008. This trend contributed to rising crude oil prices.

Higher prices motivate consumers to consume less and competitive producers to produce more. We have already seen a consumption response in the United States with total liquid fuels consumption falling from a high of 20.8 million bbl/d in 2005 to 18.8 million bbl/d in 2011 even as total U.S. population and real GDP increased over this period by 5.7 percent and 5.5 percent, respectively. For example, households are driving less, mass transit ridership is up, and the fuel economy of new vehicles has improved significantly.

We have also seen a response by firms to increase production through new technology and drilling activity, although as discussed above, activity now results in production later. For example, according to Baker-Hughes the number of rigs drilling for oil in the United States averaged 200 in 2005. On April 5, 2012 there were 1,329 rigs drilling for oil. In

addition, during 2005 only about 13 percent of the rigs were drilling horizontal wells. By 2012 the share of horizontal rigs, which allow firms to maximize production from tight oil and gas formations, had increased to 59 percent. As a result of past activity, EIA expects that total production by non-OPEC countries will increase by 0.85 million bbl/d in 2012, compared with an increase of 0.04 million bbl/d in 2011.

However, the lead time required to develop and drill new resources can be lengthy, particularly offshore. Consequently, the market's response to unexpected supply disruptions can be limited and dependent on readily-accessible supplies, such as surplus crude oil production capacity, which is held only by OPEC member countries. In the April 2012 *Short-Term Energy Outlook*, EIA projects OPEC surplus crude oil production capacity to increase slowly from an estimated 2.5 million bbl/d in March 2012 to 3.7 million bbl/d at the end of 2013. This is due to OPEC member countries increasing their production capacity, non-OPEC supply growth, and the recovery of production in countries currently experiencing supply disruptions, such as Libya, Syria, Yemen, and Sudan/South Sudan.

## QUESTIONS FROM SENATOR CANTWELL

**Q1d.** Because oil companies enjoyed greater profits while producing less oil when prices increased from 2003-2008, what incentive exists for these companies to produce more in response to a tightening market?

**A1d.** At 9.12 million barrels per day, the total production of the five largest investor-owned oil companies in 2008 was less than 11% of the world's total production of liquid fuels.

Because each company has such a small share of the total market, they are much better off producing more oil even if the incremental production causes a small decline in the world oil price.

There are several reasons why international oil company production can decline even as oil prices rise. Most of the oil produced by the largest oil companies is produced overseas under "production sharing agreements" (PSA), which are contracts with foreign governments that specify the government and company production shares under different oil prices. PSAs are designed to increase the foreign government's share of total production -- and to reduce the international oil company's share -- as oil prices rise. Even if total oil production from an overseas oil field is growing, under the terms of a PSA, the international oil company's share of production from that field can decline if rising oil prices reduces the company's share of the total production.

Depletion and restricted access are also reasons why international oil production might decline even as oil prices increase. Typically, large, low-cost oil fields are discovered and developed first; with smaller, more difficult, and/or more costly prospects being

developed later in an oil province's production history. The depletion of low-cost oil fields can cause production in an oil province to decline even as oil prices rise.

Finally, international oil company production can decline even as prices rise and world oil production increases because the investor-owned companies do not have commercial access to many of the most prolific oil regions in the world.

## QUESTIONS FROM SENATOR CANTWELL

### 2. ALTERNATIVE FUELS PROVIDE COMPETITION AT THE PUMP, LOWERING GAS PRICES

While I appreciate the expert testimony that I think has been helpful in understanding the current dynamics of world oil markets, I am more interested in real solutions that will lower prices at the pump. That's what my constituents care about and probably what every American family and business cares about. We know that no amount of domestic oil drilling is going to change the world price of oil. AP's recent analysis of the last 36 years of data shows there is no statistical correlation between how much oil comes out of U.S. wells and the price at the pump. Similarly, the EIA found that even the most comprehensive domestic drilling proposals would only decrease gasoline prices by 3 to 5 cents—and not until 2030. But I think there is less awareness that broadening fuel choices can harness the power of free market competition to keep a lid of gasoline prices and the price volatility that keeps hammering our economy. Simply put, we need to prioritize ways to end the monopoly that oil has over our transportation system. Alternative fuels, such as methanol and ethanol, can compete within an open market. These fuels can be produced from domestic energy resources available in every state—including natural gas, agricultural waste, energy crops, and even trash—often for less than the price of gasoline.

That finding is clear in the experience Brazil has had with flex fuel vehicles (FFVs). In 2008—as the U.S. and most of the world was over a barrel with no alternative to \$147 oil—90 percent of the vehicles on the road in Brazil were FFVs. These were vehicles, many made by American car manufacturers, capable of burning blends ranging from 100 percent gasoline to 100 percent alcohol. When prices spiked, Brazilians made the obvious choice and simply bought more of their domestically-produced biofuel than gasoline, which was as much as three times the price of alcohol. It only costs around \$100 or less to manufacture a flex fuel capable vehicle, an investment that will quickly be recouped by savings at the gas pump.

Methanol could be the key to breaking oil's monopoly over the transportation system and our foreign oil dependence. That's because methanol is easily produced from America's abundant new natural gas supplies at the equivalent of \$3 per gallon. It can also be produced from other domestic resources such as coal and biomass, which could keep hundreds of billions of dollars in the American economy rather than enriching foreign treasuries. Methanol capable vehicles were first produced in the United States in 1980s and are broadly available on the Chinese market today. This investment is also an important insurance policy against future oil price spikes likely in response to international events like Iran shutting down the Strait of Hormuz.



The U.S. Energy Security Council --the highest level non-governmental group ever assembled to address our nation's urgent energy challenges-- believe an Open Fuels Standard is the simplest, least-cost approach for reducing the strategic importance of oil, and the corresponding liability of gasoline price spikes that wreak havoc on our economy and American family budgets. In fact, this Council --a bipartisan group of former cabinet Secretaries, Senators, oil company and Fortune 500 CEOs-- said that making new cars capable of running on alternative fuels was the single most important thing Congress can do to have a lasting impact on America's energy security.

So I would like to know what would happen if millions of gallons of alternatives to petroleum became available and effectively ended the monopoly oil has on our nation's transportation system.

**Q2a.** Let's say that 20 to 30 percent of our nation's petroleum demand could be replaced with alternative fuels such as methanol derived from natural gas or ethanol from non-food biomass at prices less than the current price of gasoline, what impact do you think that would have on overall gasoline prices?

**A2a.** A scenario in which 20 to 30 percent of U.S. petroleum demand could be replaced by alternative fuels that could be profitably produced and sold at prices below the price of gasoline in energy equivalent terms, if realized, could exert significant downward pressure on both crude oil and gasoline prices. If comparable penetration of such fuels could also be achieved in foreign markets for motor fuels would also increase downward pressure on prices. An important factor in considering the posited scenario involves the extent to which alternative fuels are compatible with existing vehicles and infrastructure.

## **QUESTIONS FROM SENATOR CANTWELL**

**Q2b.** Do you think that having competing fuels at the gas pump would help lower prices because consumers can switch between fuels?

**A2b.** Given the uncertainties associated with global fuel markets, if significant long term growth in economically competitive alternative fuel consumption were achieved, a large displacement of crude oil could result in a material reduction in the prices of petroleum based transportation fuels. An increase in the price-responsiveness of demand for petroleum-based motor fuels could also reduce the size of the change in the oil price needed to restore market balance in the wake of a shock affecting oil supply or demand.

## QUESTIONS FROM SENATOR CANTWELL

**Q2c** How do continued elevated oil prices, say any level above \$80 a barrel, make petroleum alternatives more competitive?

**A2c.** High oil prices allow petroleum alternatives to sell for a higher price than they would under low oil prices, which provide a potential market opportunity for certain higher cost alternatives to become economically viable. Absent policy initiatives, alternative fuels must compete against the wholesale cost of the fuel they displace. Crude oil has generally made up the overwhelming majority of the wholesale gasoline price. In 2010 the annual WTI spot price was \$79.48 per barrel (or about \$1.90 a gallon) and wholesale gasoline in New York Harbor was available for an average of \$2.10 per gallon. However as mentioned in the first part of the question, alcohols must generally now compete on an energy equivalent basis as additional volumes must be added for high-level blends (e.g., E-85). To be competitive with retail regular gasoline at \$2.00 a gallon in a high-level blend; ethanol and methanol would need to be available for \$1.35 a gallon and \$1.03 a gallon, respectively.

## QUESTIONS FROM SENATOR CANTWELL

### 3. FUTURE OIL PRICES

My take aways from the witnesses today is that the era of cheap oil over, and world demand, particularly in developing countries, is ready to take off. That makes sense because the reality is the world today is overly dependent on the giant, conventional oil fields discovered back in the 1950s and 1960s. The chief economist for the International Energy Agency was very direct on this point in an interview in October 2010. He said,

*"The era of cheap oil is over. Each barrel oil that will come to market in the future will be much more difficult to produce and therefore more expensive. We all - governments, industry, and consumers - should be prepared for oil prices being much higher than several years ago."*

Yes, it's true that we can find more oil if we drill deeper and deeper and in waters farther away from land. We can also squeeze more oil out of more tar sands or shale. But all those options greatly increase costs and environmental impacts. It is important to note that this supply crunch happens at the very same time world oil demand is expected to increase rapidly. According to the International Energy Agency, not only will world oil demand grow by 25 percent by 2030, but 93 percent of new demand will come from non-OECD countries -- mainly China and India. So not only will there be more people demanding access to a shrinking, limited supply of oil, we'll now be fighting with China and India who can now afford to bid against us for this finite and currently irreplaceable resource.

Even a top Saudi Arabian energy official recently expressed serious concern that world oil demand could peak in the next decade which explained why they were working to diversify their country's economic base. If the Saudi government is talking about diversifying, I think that should be a wakeup call for all of us: we need to be figuring out how we diversify A.S.A.P.

The price of a barrel of oil is roughly the same as the price at the beginning of 2008. And today's national average price of gasoline is only 20 cents below its highest ever in the summer of 2008 when oil reached almost \$150 per barrel. Yet few would say our economy is quite as robust now as it was then.

- Q3a.** I would be interested in hearing what the panelists would estimate the price of oil to be today, given all the new economic and geopolitical factors, if our economy was firing on all cylinders again?
- A3a.** Recent experience demonstrates that world oil prices can be extremely volatile, and it is very difficult, even in the short-term, to estimate the sensitivity of world oil prices to an

individual factor, such as U.S. economic growth. Global economic growth is likely to be a more important influence on oil demand than growth in the U.S. economy alone.

However, the price of oil is affected by numerous factors that occur on a global basis and there is a very wide range of uncertainty about the future probability of occurrence and values of many of these factors.

As reported in EIA's *Short-Term Energy Outlook* for April, the 95% confidence interval for January 2013 oil prices (WTI) ranges from \$68 to \$164 per barrel. The upper and lower bounds of this range are estimated using the market prices of WTI call and put options, and the breadth of the 95% confidence interval reflects the high uncertainty among market participants about the future values of a number of factors that significantly affect oil prices

## QUESTIONS FROM SENATOR CANTWELL

- Q3b.** I think we are only a few years from the whole world being back to 2008 levels of growth or beyond. What will that mean for world oil prices within the next five years?
- A3b.** In 2008, oil prices reached a high of \$145 per barrel in July (daily spot price in nominal dollars) and a low of \$30 per barrel in December of that year as the global recession substantially dampened demand. Improving economic conditions, especially in the developing economies, largely supported continuing oil price increases from 2009 and into 2011. Continuing unrest in many oil-supplying nations of the Middle East and North Africa has helped to keep oil prices high into 2012.

Because so many different factors affect oil prices and there is such great uncertainty regarding the future value of those factors, it is not possible to state definitely how one of those factors will affect future oil prices. Recognizing the uncertainty in long-term oil prices, EIA presents three price paths in its long-term energy outlooks that span a very wide range of potential prices (and still do not encompass all possibilities). The 2020 oil price assumptions in the *International Energy Outlook 2011* vary from \$51 per barrel to \$186 per barrel (real 2010 dollars). These price paths represent possible scenarios that vary expectations about world oil demand and decision-making by key OPEC member countries with access to high-quality oil resources. These factors, in addition to the economics of non-OPEC conventional liquids supply and the unconventional liquids supply in both OPEC and non-OPEC regions, will all play a role in determining future oil prices.

## QUESTIONS FROM SENATOR CANTWELL

**Q3c.** Is it safe to say that the era of cheap oil is over? Will the average price of oil be over \$100 for the foreseeable future, unless we have another economic collapse like the one in 2008?

**A3c.** Many analysts expect rising demand for oil in the developing world to push crude oil prices higher in real terms over the coming years. EIA's Annual Energy Outlook Early Release Reference case, projects the price of light sweet crude oil at Cushing, Oklahoma in real 2010 dollars will rise to \$120 per barrel by 2016 and then steadily increase to \$145 per barrel by 2035. However, past experience suggests that analysts should be humble in making long-term price projections, which are highly uncertain. There is always a possibility of surprises in alternative fuel technologies, in identifying new sources of traditional fuels, as has recently occurred in natural gas markets with the advent of shale gas, or in production policies adopted by OPEC member countries with access to high quality resources that can be developed at relatively low cost. Therefore, I think it would be unwise to completely rule out the possibility that annual average oil prices would fall below \$100 absent an economic collapse.

## QUESTION FROM SENATOR LANDRIEU

- Q1.** Dr. Gruenspecht, your study -- *Potential Impacts of Reductions in Refinery Activity on Northeast Petroleum Product Markets* -- has been widely cited since its release in February. One issue that has received attention is EIA's contention that American domestic tank vessel capacity might be in "short supply" if another Northeast refinery closes and more product must move from the Gulf to the Northeast. I understand that three weeks ago you learned that EIA's analysis accidentally counted only American tankers and did not count American tank barges, including modern articulated tug barges. According to American Maritime Partnership, EIA has undercounted American tank vessel capacity by approximately 50%.

Your study continues to be cited for the proposition that American tank vessel capacity may be inadequate and has led others to suggest Jones Act waivers. It has been three weeks. When do you plan to correct the record? Don't you have the responsibility to let the media, policy-makers and the public know that your conclusions will likely change?

- A1.** Updated information on the availability of Jones Act vessels was made public April 4, through EIA's *This Week in Petroleum*. EIA has modified the report and added a direct link to this article on the home page of the EIA study referenced in your question. The timing of this update was due in large part to the fact that the most widely used information source is private, and ultimately we were not able to obtain the copyright permission to publish data from that source. From our perspective, the issue of needing to move product from the Gulf Coast to the Northeast was not the number of vessels, but rather their availability, which is still a concern as discussed in *This Week in Petroleum*. For example, it would take 20 barges with a capacity of 100,000 barrels each to supply 100,000 bbl/d of ultra-low sulfur diesel from the Gulf Coast to the Northeast on a dedicated basis. (If larger vessels were available, fewer would be needed.) These vessels are presumably in service elsewhere now, and it is not clear how their current service would be replaced.



As indicated in the April 4 *This Week in Petroleum* article, supply disruptions and the largest costs would likely be incurred during the initial transition period following a shutdown of the Sunoco Philadelphia refinery as the market resolves any initial supply dislocations. While the maritime industry is flexible and confident of its ability to supply needed volumes, which could be large, short-term flexibility is more limited than long-term flexibility. If the initial volume need is high, rerouting vessels from existing service may come at a higher cost than usual rates. Imports would play an important balancing role, potentially reducing the need for domestic shipping. While we acknowledge the U.S. maritime industry's confidence, it remains unclear exactly how and at what cost the Northeast would be supplied, and what, if any, additional costs might be incurred outside of the Northeast if significant domestic shipping is diverted from other uses in the short run.

## QUESTIONS FROM SENATOR MURKOWSKI

**Q1.** I know there are no "silver bullet" solutions that will immediately bring down gasoline prices, but I wonder if you have any thoughts about steps that we might take to at least try and alleviate some of the pain people are feeling at the pump in the short term?

**A1.** Although there may be no "silver bullet" to immediately bring down gasoline prices, several ways to save at the pump can be found on the <http://www.fueleconomy.gov/> website. Among the many fuel saving tips presented are:

- ***Drive sensibly.*** Speeding, rapid acceleration and rapid braking wastes gasoline. Avoiding this behavior may give an equivalent gasoline savings of \$0.19 - \$1.28 per gallon.
- ***Remove excess weight from your vehicle.*** An extra 100 pounds in your car can reduce the MPG by up to 2 percent. Lightening your load may result in an equivalent gasoline savings of \$0.04 - \$0.08 per gallon.
- ***Avoid excessive idling.*** Idling can use a quarter to half a gallon of gasoline per hour. Reducing idling can lead to fuel cost savings ranging from \$0.01 - \$0.04 per minute.
- ***Keep tires properly inflated.*** Gas mileage can improve up to 3 percent with properly inflated tires, resulting in an equivalent gasoline savings of up to \$0.12 cents per gallon.

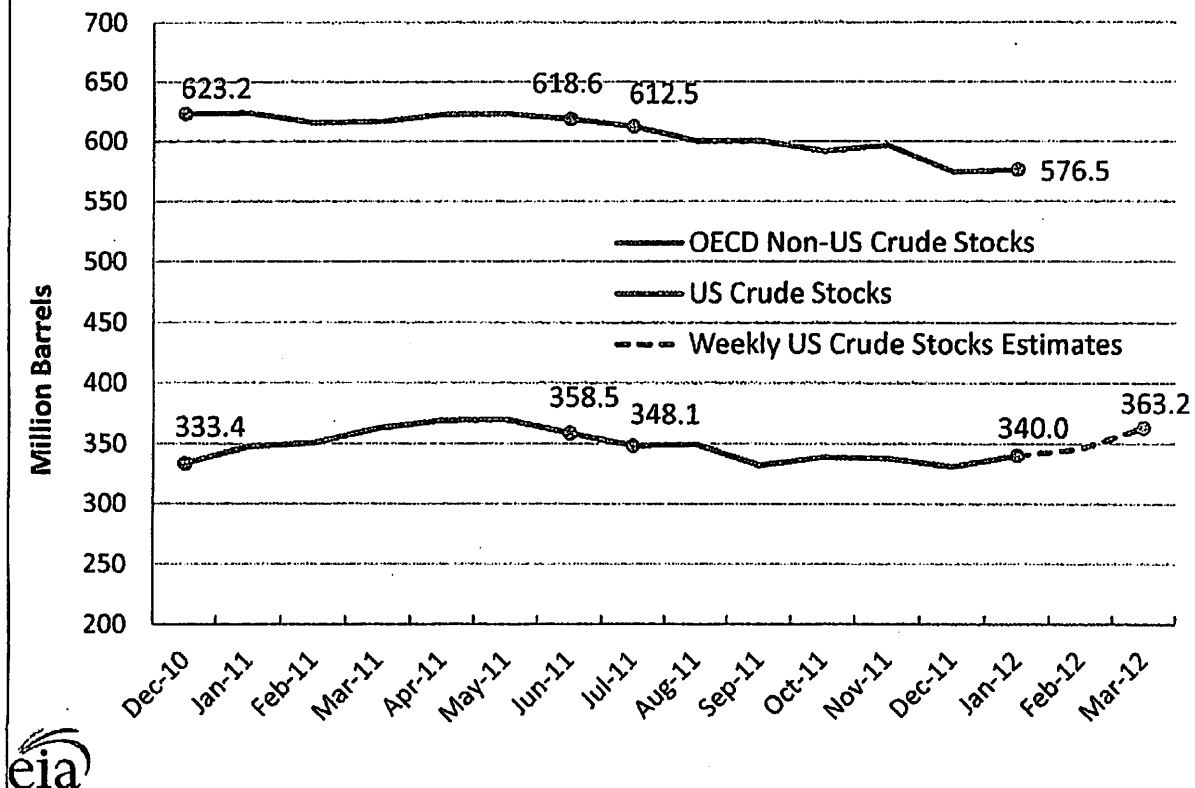
There are many more gasoline saving tips offered on the website. In addition, this information is also available for mobile devices at: <http://fueleconomy.gov/m/>.

## QUESTIONS FROM SENATOR MURKOWSKI

- Q2.** Can you please give us a sense of where our crude inventory is today, vs. six months ago? Do you recall what the inventory was in June of last year, when we sold 30 million barrels of oil out of our strategic stockpile, vs. what it was six months prior?
- A2.** According to the latest International Energy Agency (IEA) report, as of January 2012, total OECD commercial crude oil inventories were 916.5 million barrels, which is 44.1 million barrels lower than the level six months prior (as of July 2011). The U.S. portion of January 2012 OECD commercial crude oil inventories was 340.0 million barrels, down 8.1 million barrels from six months prior.

Prior to the July 2011 release of strategic reserves in response to the Libya supply disruption, OECD commercial crude oil inventories were 977.1 million barrels, which was 20.5 million barrels higher than their level six months earlier. The U.S. portion of OECD commercial crude stocks in June 2011 was 358.5 million barrels, 25.1 million barrels higher than their level six months prior. The EIA's latest initial estimate of U.S. commercial crude oil inventories for March 2012 is 363.2 million barrels, which is 31.4 million barrels above U.S. crude oil inventories six months earlier in September 2011.

## Commercial Crude Oil Inventories





**Department of Energy**  
Washington, DC 20585

June 13, 2012

The Honorable Michael R. Turner  
Chairman  
Subcommittee on Strategic Forces  
Committee on Armed Services  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On April 17, 2012, David Huizenga, Senior Advisor for Environmental Management testified regarding the Fiscal Year 2013 Budget Request for Atomic Energy Defense Activities and Nuclear Forces Programs.

Enclosed is the response to a question that was submitted by Congressman Langevin for the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher Davis", is written over the typed name.

Christopher Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Office of Congressional and Intergovernmental  
Affairs

Enclosure



## **QUESTION FROM CONGRESSMAN LANGEVIN**

### **Fiscal Year 2013 Budget Request for Atomic Energy Defense Activities and Nuclear Forces Programs**

**Tuesday, April 17, 2012**

- Q.** The DOE received \$5.1 billion for Defense Environmental Cleanup through the American Recovery and Reinvestment Act of 2009. Can you provide a status of the projects this \$5.1 billion funded?
- A.** The Environmental Management (EM) American Recovery and Reinvestment Act Program has demonstrated tremendous success in accelerating the environmental cleanup of contaminated facilities, lands, and groundwater across the EM complex. Utilizing the full \$5.99 billion received in Recovery Act funds, EM has completed 92 percent of the projects/cleanup activities on-time and within budget. EM has also reduced its environmental contamination footprint from over 900 square miles to 316 square miles as of March 30, 2012. In total, EM has initiated 126 discrete projects/cleanup activities (85 Defense Environmental Cleanup funded and 41 Non-Defense funded). To date, 95 projects/cleanup activities have been completed (64 Defense funded and 31 Non-defense funded). Currently, the Defense Environmental Cleanup Recovery Act account has a balance of approximately \$215 million that will be utilized to complete 21 remaining projects/cleanup activities.



**Department of Energy**  
Washington, DC 20585

June 27, 2012

The Honorable Jeff Bingaman  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On April 26, 2012, Patricia Hoffman, Assistant Secretary, Electricity Delivery and Energy Reliability, testified regarding weather related electricity outages.

Enclosed are the answers to 11 questions that were submitted by Ranking Member Lisa Murkowski, and Senator John Barrasso to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher Davis", is positioned above the printed name.

Christopher Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Office of Congressional and Intergovernmental  
Affairs

Enclosures



## QUESTION FROM SENATOR MURKOWSKI

During the FERC's Technical Conference on November 30, 2011, there was testimony by The Honorable Betty Ann Kane of the Public Service Commission of the District of Columbia and Ms. Debra Raggio, Vice President, Government and Regulatory Affairs, Assistant General Counsel, GenOn Energy, Inc., about the difficulties created by the conflict between an environmental order or orders applicable to the Potomac River Generating Station in Alexandria, VA and the need for that station to provide service to a nearby substation and/or otherwise to the electric system in and around Washington D.C. (See, e.g., FERC Technical Conference Transcript 11-30-11 pp. 324, 325, 333-337).

**Q1:** Please provide a summary of your office's role, and that of the Department of Energy more generally, in resolving that controversy. Please also provide a timeline of Departmental attention to the issues in that matter and detail the time that elapsed between the time when the problem came to the attention of the Department and the time when the controversy was resolved.

**A1:** On August 24, 2005, in response to a decision by Mirant Corporation to cease generation of electricity at its Potomac River generating station, the District of Columbia Public Service Commission (DCPSC) requested that the Secretary of Energy issue a Federal Power Act (FPA) section 202(c) emergency order requiring the operation of the generating station in order to ensure compliance with reliability standards for the central D.C. area.

DOE has used section 202(c) to address various emergency situations, such as orders issued to allow generators in ERCOT to sell power to affected utilities in the aftermath of hurricanes Rita and Ike. Those orders were issued in a matter of hours by the Department acting upon its own motion without consultation with any other Federal or state agencies. The Mirant situation was fundamentally different in that the plant had ceased operation in response to a federally-authorized State agency action concerning violations of Federal



environmental law, and there were no emergency events that presented an immediate threat to continuity of electric service in D.C. DCPSC's petition presented only a general claim that reliability was compromised without particular evidence or analysis. Faced with that situation, the Department conducted an independent reliability analysis, and began a process of consulting with the U.S. Environmental Protection Agency (EPA), and the Virginia Department of Environmental Quality (DEQ) on the environmental issues. The Department's analysis revealed that the real issue was not the immediate need for the plant's generation, but for its potential availability in view of limited additional transmission capacity to bring electricity into D.C. from elsewhere.

Upon completion of analysis, the Secretary made a determination that without the operation of the generating station there was a reasonable possibility an outage would occur that would cause a blackout in the central D.C. area. Therefore, on December 20, 2005, the Department issued a Federal Power Act section 202(c) emergency order requiring Mirant to operate the Potomac River generating station. The process DOE undertook in response to the DCPSC's petition included close collaboration and coordination with EPA, and the DEQ.

The order required Mirant to operate in a manner to reduce the risk to reliability, but not with unnecessary exceedances of required air quality standards. The expiration date on that order was October 1, 2006, but it was extended until February 1, 2007. On January

31, 2007, DOE issued a new section 202(c) emergency order to Mirant with substantially the same terms as the earlier order. That order expired July 1, 2007, pursuant to its terms.

Set forth below is a timeline of relevant actions. Pertinent documents are available online at <http://energy.gov/oe/does-use-federal-power-act-emergency-authority>.

- August 19, 2005 – the DEQ issues a letter asking Mirant to take immediate steps to ensure protection of human health and the environment in the area surrounding the generating station, up to and including potential shutdown of the facility.
- August 24, 2005 – Mirant shuts down all five generating units at the generating station.
- August 24, 2005 – the DCPSC files an *Emergency Petition and Complaint* with both the United States Department of Energy (DOE or Department) and the Federal Energy Regulatory Commission pursuant to the FPA.
- August 2005 through December 2005 – DOE conducts an independent analysis of the electricity reliability situation in D.C. and analyzes the generating station's role in ensuring a sufficiently reliable supply of electricity to that area, particularly given the lack of transmission capacity into D.C. DOE's analysis is conducted by the Department's Oak Ridge National Laboratory.
- December 20, 2005 - Order No. 202-05-3 is issued. It orders Mirant to generate electricity at its Potomac River generating station pursuant to the terms of the order.
- January 18, 2006 - DOE issues a notice of the emergency order (published in the Federal Register on January 20, 2006, 71 FR 3279) in which it commits to preparing a Special Environmental Analysis (SEA) pursuant to the Council on Environmental Quality's Regulations Implementing the Procedural Requirements of the National Environmental Policy Act of 1969 (NEPA), 40 C.F.R. 1506.11. The SEA is issued on November 22, 2006, with comments due by January 8, 2007.
- Order No. 202-05-3's original expiration date was October 1, 2006. Because the transmission redundancy problems continue in the absence of the completion of two new 230 kV lines in the process of being constructed by Pepco (the DCPSC regulated local utility), and because the SEA is not yet completed, two short-term extensions of

the emergency order are issued pending consideration of the required SEA and review of comments thereon. The first extension, Order No. 202-06-2, is issued on September 28, 2006 with an expiration date of December 1, 2006. The second extension, Order No. 202-07-1, is issued on November 22, 2006, and with an expiration date of February 1, 2007.

- June 1, 2006 - EPA issues an Administrative Compliance Order (ACO) pursuant to Section 113(a)(1) of the Clean Air Act (the "Act"), 42 U.S.C. § 7413(a)(1). EPA's order requires that the plant take steps to limit emissions while meeting the requirements of DOE's order.
- June 2, 2006 – DOE issues a letter order to Mirant ordering it to operate in accordance with the terms of the ACO.
- January 31, 2007 – Order No. 202-07-2 is issued. DOE considered the environmental impacts of the Mirant order based on the completed SEA and extended the emergency order until July 1, 2007.
- July 1, 2007 – DOE order expires per its terms.

## **QUESTION FROM SENATOR MURKOWSKI**

**Q2: Please identify the Departmental employees by position who led the effort or otherwise spent more than 20 professional hours attending to it.**

**A2: Numerous DOE personnel were involved in various stages of the Mirant emergency order process, from the initial consideration and analysis through administration of the order.**

**The personnel most closely involved were appointees and career DOE officials from the Office of Electricity Delivery and Energy Reliability and the Office of the General Counsel. The Assistant Secretary for Electricity Delivery and Energy Reliability and the General Counsel participated substantially in the emergency order process.**

## QUESTION FROM SENATOR MURKOWSKI

**Q3:** Please outline your recommendations for improvements to the process undertaken in that case, and your recommendations for expansion or reform of the Department's authority to strengthen and streamline the Department's ability to protect electric reliability in the face of conflicts such as were present in the Potomac River case and similar issues or conflicts that may be present more generally in light of recently-issued and pending EPA regulations that may affect electric generating units.

**A3:** DOE has used section 202(c) to address various emergency situations, six times since DOE's creation in 1978, most of which did not impact environmental laws. For example, in the aftermath of hurricanes Rita and Ike emergency orders were issued to allow generators in ERCOT to sell power to hurricane-affected electric utilities. As provided under section 202(d) of the Federal Power Act, operating pursuant to 202(c) orders provided the generators the ability to sell outside of ERCOT, while protecting them from being subject to FERC jurisdiction based on those emergency sales. Because of the urgency of the situation, those orders were issued in a matter of hours by the Department acting upon its own motion without consultation with any other Federal or state agencies.

The Mirant situation in 2005 was fundamentally different in that the plant had ceased operation in response to a State agency letter concerning environmental violations. The D.C. Public Service Commission petitioned DOE to issue an emergency order to maintain reliability, but provided only a claim that reliability was compromised without any evidence or analysis. Faced with that situation, the Department began the process of consulting with the U.S Environmental

Protection Agency (EPA) and State of Virginia on the environmental issues, and conducting a reliability analysis.

Thus the process DOE uses in issuing 202(c) emergency order can vary considerably based on the factual situation and whether other Federal or State laws are impacted. Flexibility is essential and the Department is leery of developing a formal process that may expedite a decision to issue an emergency order in a given instance, but prove an unnecessary hindrance in another.

However, the Department can work to ensure it continues to have fast and ready access to appropriate experienced staff, and as need be expert consultants, that are able to understand and converse in the various electricity generation, electricity transmission, electricity reliability, and environmental areas of expertise that would be needed in any future requests for use of DOE's emergency authority under sec. 202(c) of the Federal Power Act. This should include periodic meetings with relevant staff at other Federal agencies, such as EPA, so that agency staffs are familiar with each other and the legal authorities that would be used.

## QUESTION FROM SENATOR MURKOWSKI

**Q4:** Please also outline to the extent now possible the Department's plans for responding case-by-case to controversies of this type that may arise as a consequence of the EPA MATS Rule, the Cross-State Air Pollution Rule, the Clean Water Act 316 (b) Rule and any other similar rule that may be relevant to the Department's analysis and plans. In responding to the foregoing questions, please refer to your answer to Senator Murkowski during the hearing concerning the ability of the Department of Energy and/or EPA to respond case-by-case to conflicts between the maintenance of electric reliability and compliance with environmental rules applicable to generating units.

The cumulative effects of EPA regulations on electric reliability have been a much-discussed topic in recent months. FERC convened a Technical Conference, discussed above, to examine this issue. Commissioner Norris testified before the Committee that he “encouraged EPA to consider the cumulative impact of their regulations.”

The DOE Office of Policy and International Affairs published a report on this issue, *Resource Adequacy Implications of Forthcoming EPA Air Quality Regulations*, on December 1, 2011. However, FERC and NERC were not consulted. Moreover, the report assessed resource adequacy only, not electric reliability, and only considered the impact of EPA’s Utility MACT rule and Cross State Air Pollution Rule (CSAPR). The forthcoming Cooling Water Intake – 316(b) Clean Water Act Rule and Green House Gas New Source Performance Standards were not assessed.

Your office was consulted for this report, but did not take the lead in producing it. In response to my question, “why wouldn’t it be [OE] that would head up this type of a review?” you stated the following:

*...Our office tends to look at, I will say, emergency-related events, energy events on the system, and we do the modeling and the analytics with respect to emergency events and that’s been our mission and our focus, in looking at what is the technology to improve the energy infrastructure, what is the any potential impacts [sic] from weather or emergency events, and then how do we facilitate the recovery from those events. And that’s been the focus and the mission of our organization.*

**A4:** Upon receiving a request for a Federal Power Act (FPA) section 202(c) order, the Department investigates to determine if the request does constitute an emergency under DOE’s authority, including verifying any claims about electricity reliability made in the request. In cases where a generator’s need to operate under a possible

section 202(c) order may conflict with its ability to comply with an environmental regulation it is subject to, the Department engages with the EPA, as well as the relevant state environmental authorities, to identify the terms and conditions to operate under a 202(c) order that are necessary for the generator to address the emergency situation that has been verified earlier while still complying with environmental statutes. If the occasion should arise where it becomes necessary for the Department to issue a 202(c) order before EPA can establish an Administrative Compliance Order (ACO) with the generator, the Department could issue a subsequent order amending the original order to incorporate the operating and environmental mitigation conditions of EPA's ACO.



## QUESTION FROM SENATOR MURKOWSKI

**Q5:** Does OE only assess electric reliability in response to emergency events *post hoc*?

**A5:** The Office of Electricity Delivery and Energy Reliability (OE) assesses electric reliability on an as-needed basis with several of its initiatives in accordance with its mission. Reliability analyses are an important part of OE's work to achieve a reliable and secure electric grid through planning, preparedness and analysis.

For nearly a decade, OE has been heavily engaged with the electricity sector in efforts to ensure there is a more reliable and secured electric grid as part of DOE's designation as the Sector-Specific Agency (SSA) for the energy sector. The SSAs were created under Homeland Security Presidential Directive 7 (HSPD-7) and were tasked to enhance the protection and resilience of the Nation's critical infrastructure, as well as with strengthening national preparedness and ensuring timely response and rapid recovery of critical infrastructure in the event of an attack, natural disaster, or other emergency.

In its SSA role, OE engages with the electricity sector on numerous issues, including the preparedness of the sector to address reliability threats from geomagnetic disturbances. Additionally, OE designs and facilitates regional energy assurance exercises to help state and local participants evaluate their assurance plans. Participants at these exercises included representatives from state energy offices, public utility commissions, governor's offices, and the electric

industry. Working through these and similar activities, OE can assess reliability of the grid and its related restoration capability prior to actual emergencies.

In addition to working with states and other stakeholders on energy assurance and preparedness initiatives, OE also provides technical assistance to states, regions and other federal agencies. This technical assistance includes request for reliability assessment resources and general impact information due to new technologies, regulatory changes and resource planning. Through this assistance, OE helps facilitate the reliability assessments by states and regions and can then leverage this information to address any potential reliability emergencies identified at a regional or local level.

In its analytical role, OE also investigates the impact of new technologies and the ability of the grid to adapt to such technologies, e.g., variable generation, cycling of conventional generation. These analyses provide insights into potential reliability issues that may arise as new technologies are integrated into the electric system, allowing OE to further investigate mitigating measures to avoid such reliability issues, e.g., frequency response and other operational controls.

Moreover, through its Presidential Permit and Export Authorization Programs, OE considers the impacts on electric reliability of requested permits for the construction, connection, operation and maintenance of facilities for the transmission of electric energy at international boundaries or the export of

electricity to a foreign country, respectively. Through these programs, OE assesses grid reliability to ensure that there is no negative impact on the sufficiency of electricity supply or an impediment to electric sector planning before issuing export authorizations and Presidential permits to avoid emergencies that might arise without such a preventative assessment.

Under the Energy Policy Act of 2005, DOE is required to generate a triennial congestion study which evaluates the grid system and identifies geographic areas where transmission congestion is inducing a variety of possible adverse impacts, which may include reliability problems. Development of the congestion studies has been assigned to OE. OE examines many kinds of transmission-related studies and data sets to identify geographic areas experiencing transmission congestion. The findings of DOE's congestion studies, and public comments on such studies, may lead to decisions by the Secretary to designate certain geographic areas as National Interest Electric Transmission Corridors. OE also currently facilitates broader interconnection-wide transmission planning to address not only potential congestion issues, but also generation, transmission, and resource needs to avoid future reliability problems.

Yet another example is the implementation of the Department's Federal Power Authority section 202(c) emergency authority. Should a situation arise that may warrant a DOE emergency order under that authority, OE may need to conduct a reliability assessment. If so, OE works closely with the regional reliability

coordinators that are part of the North American Electric Reliability Corporation (NERC), independent system operators (ISOs) and regional transmission operators (RTOs), and local electric utilities as need be. Under the Federal Energy Regulatory Commission's (FERC's) oversight, NERC has the responsibility for monitoring and assessing bulk power electric grid reliability and enforcing reliability standards. OE leverages the work and expertise of these organizations, as only the nation's grid operators and planners will have the detailed data needed to assess electric grid reliability.

## QUESTION FROM SENATOR MURKOWSKI

**Q6:** Can OE effectively perform its mission without prospectively assessing the reliability of the electric grids?

**A6:** Assessing reliability requires access to large amounts of specific data concerning a local or regional electric grid and its operation. NERC conducts its reliability assessments through extensive use of data taken on a ground-up basis by its utility industry members and then rolled up through its regional reliability coordinators. Much of the data is only known by the grid and generation operators themselves, and can involve confidential business information. Not being part of the utility industry with ready access to the data that so often can be customized to a local situation, state and Federal government agencies can only go so far in conducting their own comprehensive reliability assessments and must therefore rely on partnerships with NERC, the reliability regions, and grid operators such as Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs). That is why OE works closely with the appropriate reliability authorities to assess reliability on an as-needed basis.

That said, as the energy Sector-Specific Agency (SSA), OE engages in preparedness activities with the electric sector as well as implement its Presidential Permit and Export Authorization Programs. Both functions involve certain types of reliability assessments. Additionally, should a situation arise that may warrant use of its Federal Power Authority section 202(c) emergency authority, OE would conduct a reliability assessment as part of its consideration on whether to take emergency action. OE also developed an in-house Geographic

Information System (GIS) software platform that allows OE to monitor the Nation's electric infrastructure system in near-real time as part of its emergency response responsibilities for the energy sector.

#### **QUESTION FROM SENATOR MURKOWSKI**

**Q7:** In light of the public call for assessment of cumulative impacts of EPA rules, would you recommend to the Secretary that your office conduct a study on the cumulative impact of these four regulations – Utility MACT, Cross State Air Pollution Rule (CSAPR), Cooling Water Intake 316(b) Clean Water Act Rule, and Green House Gas New Source Performance Standards – on electric reliability?

**A7:** Only two of the regulations have been finalized, and the proposed status of the remaining rules makes assessing their impacts challenging and the results only speculative at this time. When sufficient details are known regarding the final version of the regulations, a cumulative assessment of the corresponding potential impacts may provide valuable insights regarding the range of reliability impacts that may result. Many other organizations, i.e., RTOs/ISOs, policy research groups, and other government agencies, are already conducting similar analyses. The Department is leveraging the results of these studies to avoid duplicate efforts. Should such an occasion arise where it becomes appropriate and necessary for the Department to conduct its own cumulative assessment, OE would make a recommendation to the Secretary accordingly.

## QUESTION FROM SENATOR BARRASSO

**Q1:** On December 8, 2011, I asked Dr. Majumdar at his confirmation hearing about the impact of the Environmental Protection Agency's regulations on the reliability of the electric grid. In response, Dr. Majumdar committed to me "to put together a team...to help the utilities, and all the PUCs, and the stakeholders to make sure that the grid remains reliable." Please update me on the progress of this initiative.

**A1:** Since Dr. Majumdar's testimony on December 8, 2011, an internal DOE-wide team meets periodically to report on and coordinate their individual efforts in monitoring grid reliability relating to the EPA rules. Part of this effort includes technical assistance to help utilities, state public utility commissions and other stakeholders in their compliance efforts. At the Winter 2012 National Association of Regulatory Utility Commissioners (NARUC) Meeting and the 2012 National Electricity Forum, both in February, as well as on its website, the Department announced the availability of such technical assistance. Thus far, technical assistance has been provided to a few states, upon their request.

In addition to technical assistance, the Department's efforts include continued coordination with EPA and the Federal Energy Regulatory Commission (FERC) as well as discussions with industry groups, planners and reliability organizations. For example, in February DOE, FERC, and EPA, with the nation's regional transmission operators/independent system operators (RTOs/ISOs) met to hear both what their plans are to monitor and address any possible reliability impacts from generators in their region as they implement the EPA final Mercury and Air Toxics (MATS) rule issued in December 2011, as well as any early insight the RTOs/ISOs have on potential reliability problems in their respective footprints.



**We are also, through publicly available information, monitoring the announcement of power plant retirements and the status of power plants expecting to retrofit.**

## QUESTION FROM SENATOR BARRASSO

**Q2:** On March 20, 2012, Regina McCarthy, Assistant Administrator for Air and Radiation at the Environmental Protection Agency (EPA), testified before the Senate Subcommittee on Clean Air and Nuclear Safety. Ms. McCarthy stated that EPA had not conducted an assessment of the cumulative impact of all of EPA's regulations, including proposed regulations that have not yet been made final. How can the Department of Energy assess the impact of EPA's regulations on the reliability of the electric grid if EPA has not conducted an assessment of the cumulative impact of its regulations?

**A2:** Assessing the electric grid reliability impacts of EPA's recent suite of regulations – MATS, Cross State Air Pollution Rule (CSAPR), Cooling Water Intake 316(b) Clean Water Act Rule, and Green House Gas New Source Performance Standard – is challenging given the current status of the regulations. Thus far, only two of the regulations have been finalized. Any assessments of the remaining rules, which have only been proposed, would yield results that are speculative at this time. Many other organizations, i.e., RTOs/ISOs, policy research groups, and government agencies, are already conducting similar analyses. The Department is leveraging the results of these studies to avoid duplicate efforts. Should such an occasion arise where it becomes appropriate and necessary for the Department to conduct its own cumulative assessment prior to the remaining rules becoming final, the Department's results would offer potential boundaries for the range of reliability impacts, rather than definitive impacts that would result from the suite of regulations.

### **QUESTION FROM SENATOR BARRASSO**

**Q3:** As Assistant Secretary for Electricity Delivery and Energy Reliability, do you believe EPA should conduct an assessment of the cumulative impact of all of its power sector regulations, including proposed regulations that have not yet been made final? If not, why not?

**A3:** As Assistant Secretary for the Department of Energy's Office of Electricity Delivery & Energy Reliability, I cannot speak to how EPA should assess its power sector regulations. However, it is the Department's understanding that, as EPA proposes and finalizes additional regulations, its administrative regulations require that each proposed/finalized rule be considered in concert with all other effective regulations.

#### QUESTION FROM SENATOR BARRASSO

**Q4:** As Assistant Secretary for Electricity Delivery and Energy Reliability, do you believe EPA should issue any additional final rules affecting the power sector, including the pending coal ash regulations, before an assessment of the cumulative impact of EPA's regulations is completed? If so, why?

**A4:** As Assistant Secretary for the Department of Energy's Office of Electricity Delivery & Energy Reliability, I cannot speak to how EPA should release its power sector regulations, in accordance with its statutory directives.



## Department of Energy

Washington, DC 20585

June 29, 2012

The Honorable Tom McClintock  
Chairman  
Subcommittee on Water and Power  
Committee on Natural Resources  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On March 20, 2012, Stephen Wright, Administrator, Bonneville Power Administration, Timothy Meeks, Administrator, Western Area Power Administration, James McDonald, Administrator, Southwestern Power Administration, and Kenneth Legg, Southeastern Power Administration, testified regarding the proposed Fiscal Year 2013 spending, priorities and the missions of the Bonneville Power Administration and the Power Marketing Administrations.

Enclosed are the answers to seven questions submitted by Representatives Markey and Napolitano to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Christopher Davis", is written over a circular stamp.

Christopher Davis  
Deputy Assistant Secretary for  
Congressional Affairs

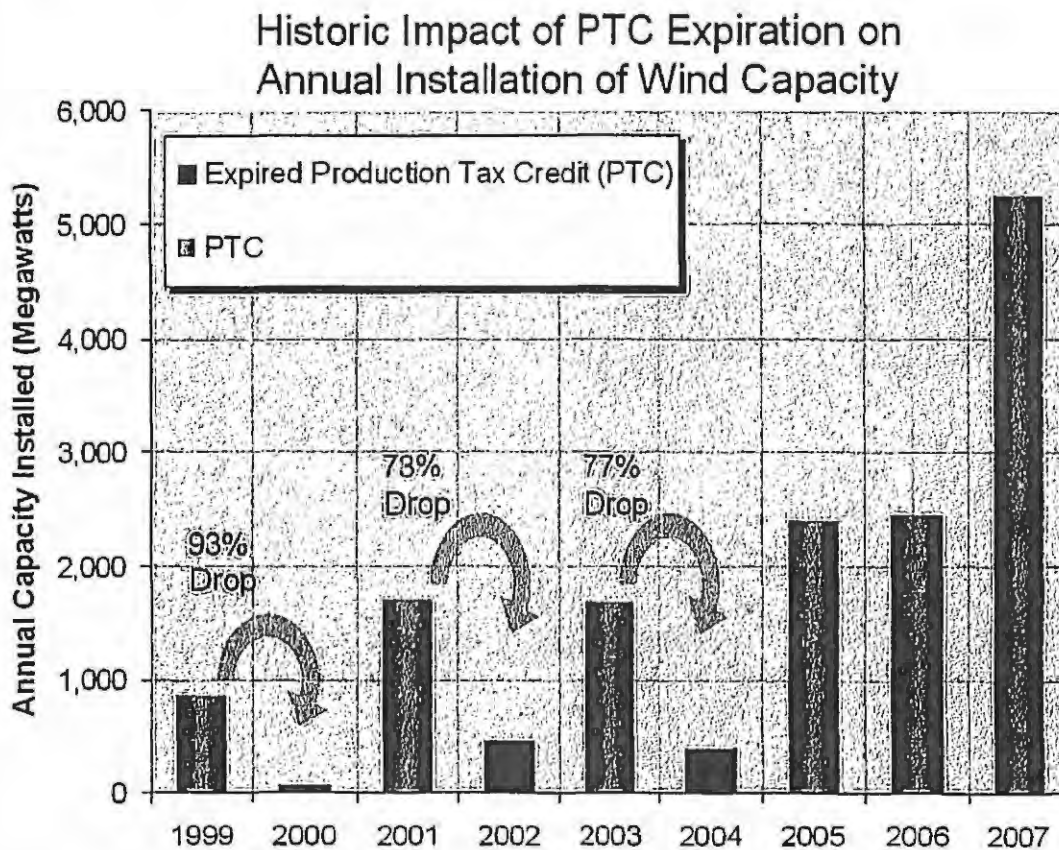
Enclosures



### QUESTION FROM REPRESENTATIVE MARKEY

Q1. Would Raising taxes on the wind industry – as would happen on January 1, 2013 if Congress does not act – increase or decrease rates for consumers and help or hurt your regions achieve their renewable energy goals?

A1. Expiration of the production tax credit for the wind industry is not expected to affect current electricity rates. However, as shown in the chart, wind installations have dropped off considerably in years when the production tax credit expired. Tax incentives such as the production tax credit and the Recovery Act 1603 program have contributed to the build out of the wind industry. Wind energy now accounts for 3% of our electricity generation.



Source: American Wind Energy Association, [http://awea.org/issues/federal\\_policy/upload/PTC-Fact-Sheet.pdf](http://awea.org/issues/federal_policy/upload/PTC-Fact-Sheet.pdf)

Over the last few years, the overall import fraction of wind turbines has declined significantly from 65% in 2005-2006 to roughly 40% in 2009-2010 when presented as a fraction of total equipment-related wind turbine costs—meaning that most wind turbine components are now manufactured domestically. There are more than 200 wind turbine component plants operating in the United States, and the domestic wind industry employs 75,000 workers.

With the expiration date for the production tax credit looming, it is expected that major employers in the domestic wind industry will lay off workers because of the decrease in demand for new wind farm development and associated impacts throughout the entire supply chain anticipated in 2013.

Bloomberg's Q1 2012 North America Wind Market Outlook states that most new wind projects in 2013-2015 are contingent on the production tax credit, and without extension of the production tax credit only 500MW of new wind capacity installation is expected in 2013.

For these reasons, the Obama Administration supports renewing or extending 48C manufacturing tax credits, 1603 payments in lieu of tax credits, and production tax credits for wind and other renewable energy technologies.

## QUESTION FROM REPRESENTATIVE MARKEY

**Q2.** The Energy Information Administration has estimated that exporting upwards of one fifth of current U.S. natural gas consumption – the amount that natural gas companies are now requesting permission to export—could increase the price of domestic natural gas by 54 percent. What impact would that have on rates and how would it impact the electrical generating mix in your region?

**A2.** The Energy Information Administration's (EIA) report, *Effects of Increased Natural Gas Exports on Domestic Energy Markets as requested by the Office of Fossil Energy* reflected specific assumptions and scenarios specified by the Department of Energy's Office of Fossil Energy for the purpose of the report. EIA does not currently project, forecast, nor estimate that exports of domestically sourced liquefied natural gas will occur at a volume of either 6 billion cubic feet per day (Bcfd) or 12 Bcfd, as assumed in the analysis.

The 54-percent increase in U.S. wellhead prices that is cited in this question reflects a particular unlikely scenario that couples the most aggressive export assumptions (12 Bcfd, implemented at a rate of 3 Bcfd per year) with a low resource supply scenario. The maximum percentage price increase in any year of the other 15 scenarios evaluated is significantly lower. The report's Reference case, the annual average increase in wellhead prices from 2015 to 2035 over a comparable baseline case with no additional exports ranges from 9 percent to 22 percent depending on the export assumptions. On average, from 2015 to 2035, natural gas bills paid by end-use consumers in the residential, commercial, and industrial sectors combined increase 3 to 9 percent over a comparable baseline case with no exports; depending on the export scenario and case, increases in electricity bills paid by end-use customers range from 1 to 3 percent.



The range of results for the average annual change in end-use electricity prices for the NERC regions most closely associated with the Southeastern, Southwestern, Western, and Bonneville Power Administrations, from 2015 to 2035, were between -0.9 percent and 7.7 percent with the median change of 0.7 percent under Reference case conditions. Because consumers use less electricity in the scenarios where prices increase, these changes in the power prices translate into an average annual change, from 2015 to 2035, in total electricity expenditures that ranged from -1.1 percent to 4.0 percent, with a median change of 0.8 percent.

### **QUESTION FROM REPRESENTATIVE MARKEY**

**Q3. On March 16, 2012, Secretary Chu sent a memo to each of the PMAs to take certain actions to enhance grid operations under existing authorities. Do you support the Secretary's goals and objectives as outlined in the memo and what actions do you plan to take to meet them?**

**A3. Bonneville Power Administration (BPA) supports the goals and objectives set forth in Secretary Chu's March 16, 2012 memo to all of the Power Marketing Administrations (PMA). BPA appreciates that Secretary Chu has recognized the importance of the PMAs contributions to and involvement in the electricity grid, while acknowledging the extreme complexity of administering a PMA given the various governing statutes. BPA has worked closely with the Secretary for three years and has many initiatives already underway that support his clean energy agenda and call to invest in the Nation's infrastructure. We believe we are already supporting the goals and objectives of the Secretary and intend to continue to do so.**

**Western Area Power Administration (WAPA) supports the goals and objectives set forth in Secretary Chu's March 16, 2012 memo to all of the Power Marketing Administrations. We will work closely with the Department in a collaborative process with customers, Members of Congress and stakeholders to determine how to best implement the initiatives outlined in the memo. To the extent allowable under existing enabling statutes, a customized implementation plan will be developed to reflect WAPA's unique attributes and individual power system characteristics.**

**Southeastern Power Administration (SEPA) supports Secretary Chu's goals and objectives as outlined in his March 16, 2012 memo. SEPA's responsive action plan will**

be limited as the majority of the memo pertains to current and future transmission assets and SEPA does not own any transmission assets. We will continue to support customers and the public within existing authorities. SEPA remains committed to customer coordination and communication while meeting our statutory requirement to provide federal hydropower benefits at the lowest cost possible consistent with sound business principles.

Southwestern Power Administration (SWPA) supports the Administration's goals while remaining compliant with Federal statutes and recognizing SWPA's Federal power system characteristics. As expressed in Secretary Chu's March 16, 2012 memo, the Secretary will provide specific direction on implementation options and initiatives to each of the PMAs in recognition of the uniqueness of each PMA.

#### **QUESTION FROM REPRESENTATIVE MARKEY**

- Q4. In October 2011, Republicans on the Natural Resources Committee unanimously supported and successfully reported out of committee a bill that would repeal that borrowing authority that the Western Area Power Authority currently has to help provide financing for transmission serving renewable energy projects. Would repealing that borrowing authority likely increase or decrease rates for consumers in your region? Would it increase or decrease the amount of renewable energy generated in your region?**
- A4. Repeal of Western Area Power Administration (WAPA)'s borrowing authority would eliminate a source of financing for construction of transmission lines that deliver renewable energy to consumers. New renewable energy generation is less likely to be built if adequate transmission is not available. Therefore, repeal of WAPA's borrowing authority could be expected to decrease the rate at which renewable generation is developed, other things held constant.**

**Transmission facilities developed by WAPA using its borrowing authority would allow greater integration of renewable resources and exert downward pressure on electricity prices by relieving congestion on the transmission system. Thus, repeal of Western's borrowing authority could exert upward pressure on electricity prices.**

## QUESTION FROM REPRESENTATIVE MARKEY

**Q5.** On December 7, 2011, FERC found that BPA had engaged in discriminatory and non-comparable conduct by using its transmission system to curtail wind generation to the benefit of BPA's hydro generation. The Commission ordered BPA to, by March 6, 2012, submit an open access transmission tariff with FERC that ensures that BPA will in the future provide comparable and non-discriminatory transmission service. Instead, BPA submitted to FERC a "protocol" that governs the allocation of cost responsibility for a fund that will partially reimburse wind generators when BPA curtails them. The protocol says that BPA will reimburse the wind generators for lost revenues but then requires the wind generators to pay half the costs associated with the reimbursements. Why did you file this "protocol" when FERC explicitly directed you to file transmission tariff revisions? Is the protocol a "tariff" revision? If so, please provide me your transmission tariff and identify where in the tariff the protocol would be located.

**A5.** In compliance with FERC's December 7, 2011 order, BPA filed tariff provisions on March 6, 2012, addressing high wind/high water situations that lead to seasonal oversupply of electricity. Through its compliance filing, BPA submitted section 38 and attachment P to its Open Access Transmission Tariff. Please see FERC Docket No. EL11-44. These tariff provisions describe the oversupply management protocol BPA developed in response to FERC's direction.

In BPA's opinion, FERC's December 7 order did not direct BPA to file an entire open access transmission tariff. The issue raised and litigated at FERC dealt with BPA's efforts to address oversupply scenarios, and FERC ordered BPA to submit tariff provisions that addressed comparability concerns associated with that issue. Therefore, BPA believes it was directed to file only on this narrow issue.

On March 29, 2012, BPA, which is not subject to FERC jurisdiction under section 206 of the Federal Power Act (the authority relied upon by FERC in requiring open access transmission tariffs), did file its complete tariff for approval under FERC's reciprocity

standard; the oversupply management protocol provisions are included as section 36 and Attachment P as shown in the attached tariff. Please see FERC Docket No. NJ12-7 for additional details.

## QUESTION FROM REPRESENTATIVE NAPOLITANO

**Q1. "What are the implications for Western Area Power Administration of FERC's recently-promulgated guidance for FERC Order 741, "Credit Reforms in Organized Wholesale Electric Markets," requiring RTOs/ISOs to take physical title/ownership to the energy bought/sold in their respective markets?"**

**A1. Over the last decade, the energy markets have dramatically evolved from a physical-rights oriented model to a financial-rights oriented one. The financial crisis of 2008 not only impacted the banks, but also demonstrated that the energy markets were vulnerable. A default in the organized markets could lead to a damaging drop in market liquidity, thereby placing the energy markets in jeopardy. For example, one of the effects of the financial crisis was that credit went from being relatively plentiful and inexpensive to relatively scarce and expensive.**

**To respond in part to the financial crisis, the Federal Energy Regulatory Commission (FERC) issued Order 741, which reforms credit policies used in wholesale markets and became effective on October 1, 2011. FERC Order 741 shortens the billing and payment periods, reduces unsecured credit limits, and eliminates unsecured credit in the Regional Transmission Organization/Independent System Operator (RTO/ISO) organized markets. FERC Order 741 also imposes a new requirement for market participants to establish formal risk management programs. Western Area Power Administration (WAPA) has several regions that either transact directly or operate near the vicinity of a number of these organized regional wholesale markets.**

**As part of Order 741, FERC recently promulgated new guidance requiring RTOs/ISOs to take physical title/ownership to the energy bought/sold in their respective markets. This**

**makes it necessary for WAPA to acknowledge that its customers, in these markets, receive the financial, and not the physical, benefit of their Federal power allocations.**

**WAPA has closely monitored the respective FERC Order 741 credit reform compliance filings and, as appropriate, filed the relevant responses at FERC to protect its legal interests and business operating practices. WAPA has modified its business practices, consistent with Federal financial laws, policies, and regulations, to conform to the accelerated billing and payment periods, reduced unsecured credit limits, and other credit reform policies instituted by each applicable RTO/ISO.**

**WAPA anticipates that Order 741 will accelerate the replacement of physical energy transactions with financial energy transactions in energy markets run by RTOs and ISOs. WAPA will continue to closely monitor the situation and take the necessary steps to remain eligible to participate in the energy markets to ensure it can reliably serve project use and federal preference power customer loads at the lowest cost possible, consistent with sound business principles. WAPA appreciates the opportunity to update the committee of the actions it has undertaken to respond to FERC Order 741 and intends to keep the committee apprised of any changes arising out of this new regulation or the underlying market structures that could affect WAPA's operations in the future.**



## **QUESTION FROM REPRESENTATIVE NAPOLITANO**

**Q2. What changes has Western implemented to the Transmission Infrastructure Program in light of the IG management alert?**

**A2. Working with DOE, Western Area Power Administration (WAPA) has completed many of the IG's recommendations and is working to implement the remaining recommendations. These efforts include:**

- Ensuring the Montana Alberta Tie Limited (MATL) project developer and future developers implement: (i) earned value management so WAPA can monitor project progress; and (ii) adequate management reserve or equivalent to fund potential cost overruns.**
- Established a monitoring team, which consists of a diverse group of DOE and WAPA employees, to review WAPA's approved borrowing authority projects and provide a report to the Deputy Secretary on a monthly basis.**

**Finalized the Montana-Alberta Tie-Line Project (MATL) Root Cause Analysis report, which was released to the Committee on June 4, 2012.**

- WAPA, with input from DOE and industry, is also reviewing its borrowing authority project evaluation criteria and the process for reviewing projects to ensure the most promising projects receive funding.**



**Department of Energy**  
Washington, DC 20585

July 18, 2012

The Honorable Jeff Bingaman  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On March 13, 2012, Secretary Steven Chu testified regarding: "A Report of the Independent Consultant's Review with Respect to the Department of Energy Loan and Loan Guarantee Portfolio."

Enclosed are the answers to 13 questions that were submitted by Ranking Member Lisa Murkowski, and Senator Al Franken to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

Christopher Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Office of Congressional and Intergovernmental  
Affairs

Enclosures

Cc: The Honorable Lisa Murkowski, Ranking Member



## **QUESTIONS FROM RANKING MEMBER LISA MURKOWSKI**

### **1) MEASURING PERFORMANCE AT THE LOAN PROGRAMS OFFICE**

- Q1.** I'm interested in your perspective on how performance is measured and priorities established within the Loan Programs Office. Mr. Allison's report states that, "DOE should better define the desired balance between policy goals and financial goals." This seems like a pretty basic managerial function, so I was surprised to hear that Mr. Allison felt it was lacking.

Do you have any plans to develop a more formal process for establishing goals in the loan program and measuring their attainment?

- A1.** DOE constantly strives to improve the efficiency and effectiveness of its underwriting and monitoring processes.

Clearer goals have been established at the division level and assist senior management in driving those elements of the process that DOE can control. While known policy directives are shared with division managers and incorporated into everyday processes, certain policy matters may arise later in the underwriting process or after a transaction has closed. In those cases, senior LPO management will interact with senior DOE management to resolve any matters where policy concerns impact the underwriting or monitoring of a transaction. Those decisions are then communicated to the deal teams and incorporated in the structuring and monitoring of each transaction.

### **2) IMPORTANCE OF REAL-TIME CONTROLS TO MANAGE RISK [references attached chart]**

- Q2.** Mr. Allison has talked about the importance of 'real-time controls' to make sure that risks are properly managed. On that point, market trends associated with the raw materials needed for solar panels are relevant.

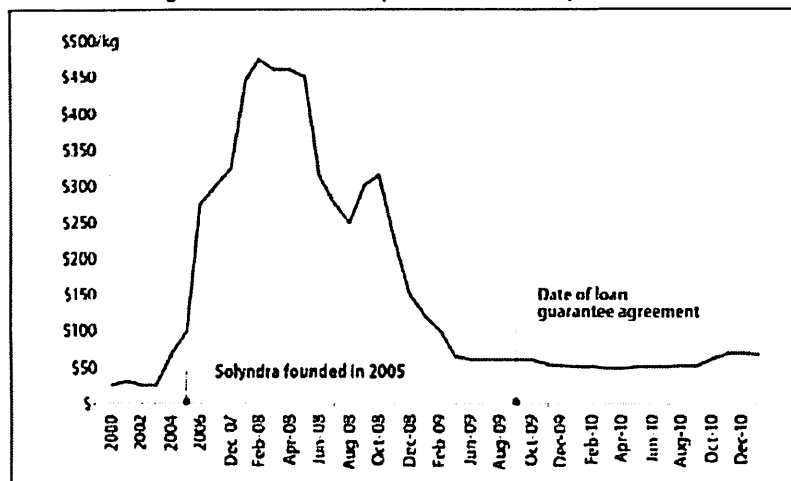
The majority of solar panels require polysilicon, but Solyndra's did not. As a result, when polysilicon prices rose in 2005, it created what the Congressional Research Service has called "a strong economic value proposition" for Solyndra. But then polysilicon dropped precipitously.

This speaks directly to the issue of real-time controls that Mr. Allison has raised.

The Department's official response to Solyndra's bankruptcy was

that it resulted from a "totally unexpected" change in the market. At a hearing in November of last year, you also said that your decision to guarantee a loan to Solyndra was "based on the analysis of experienced professionals and on the strength of the information they had available to them at the time." But, as you can see from this chart, the competitive advantage bestowed upon Solyndra by high polysilicon prices had disappeared several months before DOE closed on their loan guarantee.

Figure 1. Solar Grade Polysilicon Historical Spot Prices



Source: Bloomberg New Energy Finance, Solyndra website, DOE loan guarantee program website

Notes: This chart reflects historical solar "spot" prices, which may be different than "contracted" prices for solar grade polysilicon. Polysilicon suppliers may enter into long-term supply contracts for polysilicon material.

Q2a. Were you or the advisors you rely upon aware of this information at the time the guarantee was issued?

A2a. As part of its due diligence prior to issuing the Solyndra loan guarantee, the Department relied on an Independent Market Consultant's Report Solyndra Fab 2 Manufacturing Facility, by R.W.Beck, dated April 4, 2009. The Department commissioned additional market research from Navigant Consulting, which produced the report Independent Market Advisory Services, DOE Loan Program, Solyndra, Inc., dated February 22, 2010.

Based on the market research and the Department's other due diligence, it was confident in Solyndra's ability to compete in the marketplace at the time of financial close. This confidence was shared by the private sector, as evidenced by private equity's significant investments in Solyndra both before and after the issuance of the loan guarantee.

It is important to note that polysilicon pricing is only one driver of photovoltaic (PV) panel prices. PV module prices are also significantly driven by a supply and demand. From the time that the Solyndra loan guarantee closed until the bankruptcy, the market shifted from supply constrained to oversupplied. While Solyndra was able to significantly reduce costs, ultimately it was unable to keep pace with the dramatic margin compression that was occurring throughout the industry. In addition, market events such as the China Development Bank's available lines of credit to six Chinese PV manufactures (in 2010), negative margins, the bankruptcy of the world's largest PV cell manufacturer (Q-cells), and cuts in the European Union's PV subsidies below retail pricing, were largely unexpected across all major PV forecasting groups.

**Q2b.** If so, why did you close on the loan guarantee? And if not, would you agree that this underscores Mr. Allison's point about the need for real-time controls to mitigate risk?

**A2b.** As indicated in A2a, the Department was confident in Solyndra's ability to compete in the marketplace at the time of financial close. The Department does agree with Mr. Allison's point and believes that it has a robust system of controls and risk mitigation strategies in place.

### 3) CHANGING INTERPRETATIONS OF STATUTORY AUTHORITIES

- Q3. You revised the loan guarantee program's rules shortly after taking office, including a re-interpretation of who may have a first lien on the assets of a project that has received a loan guarantee. Specifically, your rulemaking allowed two new financing arrangements:

One is called *tenancy in common*, where "each owner holds an undivided interest in the physical project assets, and each owner typically finances its investment in the projects separately." In such a case, the rule states that "it may not be feasible to obtain a lien on all project assets."

The other financing arrangement discussed is called *pari-passu*, where sources of financing other than the Department of Energy – such as foreign Export Credit Agencies participating as co-lenders or co-guarantors – may expect to share in "collateral pledged to secure the borrower's debt obligations."

These examples are a far cry from what happened with Solyndra, but the Department has cited the rule as justification for subordinating taxpayers to the private investors of \$75 million. Nowhere in the rule is the scenario of a firm nearing bankruptcy and incapable of raising additional capital unless the Department subordinates itself contemplated. And yet, that's exactly what was allowed to happen. That required a very broad – and in my view, inconsistent – read of what's permitted under even your own rulemaking. So I'd like to know whose legal opinion relied upon to make that interpretation.

Was it DOE's General Counsel, the Department of Justice, or some combination of offices?

Who said it was legally permissible to subordinate taxpayers to private investors, and should you have sought – or did you seek – a second opinion?

What is the Department's current position on the subordination of taxpayers to private investors?

- A3. Before agreeing to the restructuring of the Solyndra loan, the Department undertook a thorough legal analysis of the provisions of Title XVII of the Energy Policy Act of 2005 (EPA 2005), and concluded that subordination in the context of the Solyndra restructuring was permitted under the statute. This analysis was conducted by career legal professionals in both the Loan Programs Office and the

Office of General Counsel and was approved by the General Counsel. It was also reviewed by DOE's outside counsel, the law firm of Morrison & Foerster, which found the analysis reasonable. The analysis also was discussed with and reviewed by lawyers in the Office of Management and Budget's (OMB) Office of General Counsel. OMB did not express to DOE any disagreement with the analysis. We also note that, on November 10, 2011, Mary Anne Sullivan, a partner in the law firm of Hogan Lovells, wrote in a letter to the Ranking Member of the Committee on Energy and Commerce, U.S. House of Representatives, that DOE's analysis "is supported by the statute and by DOE's interpretation of the statute as reflected in 10 C.F.R. Part 609, the regulations governing the loan guarantee program...." As Ms. Sullivan observed, the regulation, like the statute, treats the subordination requirement purely as a condition precedent to the issuance of a loan guarantee, and nothing in the regulation precludes subordination in this context.

The Department has not changed its position on the legality of subordination in the context of the Solyndra restructuring.

#### **4) SELF-PAID VS. APPROPRIATED CREDIT SUBSIDY COSTS**

- Q4. At a clean-energy forum hosted by the *Washington Post* last year, you stated that "we can design a program that is actually self-paid and still stimulate the most innovative industries." I was particularly interested in your reference to a self-paid program, which is not what the stimulus bill's Section 1705 loan guarantees relied upon. As you know, those loan guarantee applicants were granted access to \$6 billion appropriated to cover their credit subsidy costs.

I believe we can design a program to take advantage of benefits from authorities and appropriations that allow it to borrow at a lower cost than private sector lenders.

These might include the right to borrow at low cost from the Treasury and the

option to raise more capital through bonding authority. It would also ideally include a substantial initial appropriation, potentially funded in part by transferring Title 17 authorities and unobligated balances to the program.

The program could leverage this federal support to attract private sector co-investors for manufacturing facilities, deployment projects, or generating assets. It would operate with considerable autonomy subject to overall portfolio risk management rules such as limits on total Treasury borrowing and requirements for sound underwriting for each deal.

With this initial appropriation, the program should be self-sustaining for a substantial period, roughly ten years. To support itself, it can collect fees for financing and services, and it will charge a premium to its rate of borrowing from Treasury. Moreover, it may securitize its debt to investors in the private sector, replenishing the capital available to finance additional projects. Ideally, the program should be set up for reauthorization no later than twenty years in the future given the likelihood that market conditions will evolve dramatically in that time frame.

**Q4a.** In hindsight, do you believe that credit subsidy costs should be self-paid?

**A4a.** The economics of the projects completed under §1705 were such that imposing a self-pay credit subsidy would almost certainly have made them uneconomic, particularly in the credit environment that existed at the time that Congress appropriated the credit subsidy funding for §1705.



In FY 2012-2013, the Loan Guarantee Program will focus on portfolio management and monitoring activities on the existing portfolio as well as originating new loan guarantees to utilize remaining self-pay loan authority in the nuclear power, front-end nuclear, fossil, and renewable and energy efficiency sectors as well as the \$170 million appropriated credit subsidy for renewable and energy efficiency projects.

**Q4b.** Do you think it was wise to appropriate \$6 billion in the stimulus to pay for applicants' credit subsidy costs?

**A4b.** The original appropriation of \$6 billion to pay for applicants' credit subsidy was ultimately reduced to \$2.5 billion after subsequent rescissions. However, I do believe the significant amount of appropriated credit subsidy was appropriate, particularly given the aforementioned market dynamics, to achieve the goals set by Congress in establishing Title XVII of EPCA 2005. In hindsight, the number of credit-worthy projects that could be completed was limited given the September 30, 2011 expiration date for the §1705 program. It was nonetheless important to signal to the marketplace that these projects were a priority for Congress, and that Congress recognized the inherent difficulty for clean energy projects (particularly innovative projects) to attract private capital.

**Q4c.** How would you design a self-paid loan guarantee program?

**A4c.** Please see the answer to Q4 above.

#### **5) ADHERENCE TO STATUTORY TERMS AND CONDITIONS**

**Q5.** Much attention has been paid to the terms and conditions for loan guarantees from the 2005 energy bill. Specifically, the question of a "reasonable prospect of

repayment” is one that you have faced given Solyndra and Beacon’s failures to repay their loans.

Another provision of law requires that “No guarantee shall be made unless the Secretary determines that the amount of the obligation [when combined with other funds] will be sufficient to carry out the project.” For Solyndra, this condition was not adhered to. Another \$75 million had to come in from private investors, and to make that happen DOE put taxpayers second in line during bankruptcy.

Did you make a determination that the amounts available when the loan guarantee was closed were sufficient to carry out the Solyndra project and, if so, how do you square that with the fact that they weren’t?

- A5. Professional employees of, and advisors to, the Loan Programs Office spend up to a year or more underwriting loan guarantees issued under Title XVII of EPCA 2005.

In the course of this analysis, and the structuring of the loan, significant attention is paid to the ability of the borrower to repay the loan and to complete the project.

Further, the credit subsidy cost estimate reflects that even with a reasonable prospect of repayment, there is still some risk of default. To ensure adequate funding for completion, the construction budget always includes a reserve for contingencies.

While DOE ultimately makes the statutory determination that there is a reasonable prospect of repayment and that the project funding is sufficient to complete the project (as was the case for Solyndra and Beacon), the determination is necessarily grounded in the analysis and recommendation of the experienced professionals in the Loan Programs Office.

It is important to bear in mind that Congress wisely crafted the two statutory requirements that you cite as determinations that must be made *before* the

Department issues a loan guarantee. They are not continuing covenants, and a change in circumstances that results in shortfalls, either in repayment or in the construction budget, does not mean that the statute was "not adhered to." As has been widely discussed and reported, the difficulties encountered by both Solyndra and Beacon resulted from dramatic changes in the relevant markets that were not anticipated at the time the loan guarantees were issued. Moreover, at the time of the Beacon bankruptcy filing, the Stephentown project was virtually complete, in operation and producing revenue. Similarly, Solyndra faced a shortfall in cash because market conditions had resulted in less robust revenues than had been forecast.

#### **6) ATVM PROGRAM**

- Q6.** Five loans have been issued under the ATVM program in roughly three and a half years, including just one since March 2011. More than half of the program's credit subsidy is unused today, despite initial claims that the program was 'oversubscribed' and statements from DOE that more loans were being negotiated and on the verge of closing. Many are wondering what, exactly, is happening with this program.
- Q6a.** How many applications has DOE received under the ATVM program, and how much total loan funding have those applications sought?
- A6a.** We have received a total of 141 document submissions, 70 of which were deemed as Substantially Complete Applications. Total funding requested was in excess of available appropriations authority for the program. Requested funding data is based purely on application materials received by DOE. A substantial portion of requested funding was related to incomplete applications, and requested funding does not reflect rejected or withdrawn applications or any adjustments based on terms acceptable to the program.

**Q6b. How many ATVM applications are currently being negotiated by DOE?**

**A6b. We have a total of 27 open document submissions, 17 of which are deemed as Substantially Complete Applications. Of these 17, 11 applicants have not responded to the program for an extended period of time and are considered inactive, while the remaining 6 applications are under review.**

**Note that application submissions are first reviewed for completeness, prior to any due diligence being performed. Once a company has provided all the required information, the application is deemed "Substantially Complete" and the review process can begin. An application becoming Substantially Complete does not necessarily indicate that an applicant's business plan, technology, market strategy or financial position are fully viable, or that they will meet all criteria necessary to obtain a DOE loan. It is simply the first step in a thorough technical, legal, and financial analysis.**

**Q6c. Last summer, 18 projects were reportedly negotiating under ATVM for a total of \$9.8 billion in loans. How many of those projects are still negotiating for loans, and what would those loans total?**

**A6c. Of the 18 Substantially Complete Applications that existed in the summer of 2011, the ATVM has 17 eligible applicants remaining, 11 of which are inactive while the remaining 6 applications are under review.**

**Q6d. How many ATVM applications have been rejected by DOE to date?**

**A6d. We have received a total of 141 document submissions, 70 of which were deemed as Substantially Complete Applications. Of the 70 Substantially Complete Applications, 48 have either been rejected or withdrawn.**

**Q6e. What are the primary factors that are preventing DOE from issuing loans through the ATVM program? Is it administrative hurdles that cannot be overcome, a lack of viable projects, or other factors?**

**A6e. The ATVM Loan Program is a direct loan program, funded by the U.S. Treasury, using taxpayer dollars. The Program takes very seriously its responsibility to ensure that such dollars are awarded in the most appropriate way to protect the taxpayer's interests. That said, the program has entered into loan agreements with five borrowers and continues to closely monitor those loan transactions, insisting on the completion of milestones and fulfillment of any conditions agreed to by the applicant and DOE.**

**The ATVM and its staff endeavor to maintain openness and transparency with all constituents, including the detailed and timely response to inquiries from interested parties across the public and private sectors. The ATVM understands that its work has the ability to effect a large economic impact across a broad geographic area of the United States, including areas that have been negatively impacted during the recent economic downturn. Despite a significant increase over time in the volume of outside inquiry into ATVM, the program continues to work independently with a distinct focus on our core competencies relating to the review, analysis, negotiation and structuring of loan transactions.**

The program was established to offer a low-cost funding opportunity for financially viable companies with technically meritorious projects that are ready for commercialization. Early stage companies (which are the vast majority of applicants) face many challenges in their efforts to obtain a DOE loan. From the financial and credit risks inherent in taking on significant senior debt at an early stage in a company's lifecycle, the quality and experience of the management team, to the technical and execution risks in designing, developing and establishing a manufacturing facility, to the market risk of expected penetration and sales volumes, applicants must carefully consider all aspects of their business plan. These are the same risks analyzed by equity investors, who may or may not be identified in the initial application. To that end, equity investors must be identified, ideally prior to the issuance of a Conditional Commitment Letter, as is the practice in the market for commercial loans. ATVM understands that these equity investors are evaluating the high degree of risks these business plans face, and to achieve an equity return hurdle commensurate with such risk, often require a high degree of financial leverage. The statutory maximum leverage is 80% against eligible costs, and ATVM seeks to strike a balance between the equity return needed to attract investors and the appropriate amount of debt that can be supported by the project.

Automotive component suppliers have also had difficulty qualifying for ATVM loans. Although these automotive suppliers are potentially some of the more credit worthy borrowers within the automotive industry, they have found it difficult to provide a

direct connection between their components and qualified advanced technology vehicles, a necessary link to establish eligibility and market acceptance.

**Q6f. How many ATVM loans does DOE anticipate finalizing during Fiscal Year 2013?**

**A6f. Beyond the several applications currently in the ATVM pipeline, which are always subject to further review and analysis, the ability of the program to “finalize” loans is entirely dependent on the quality of applications received, whether new or existing, and the ability of the DOE and an applicant to reach loan terms agreeable to each side consistent with the statute. It is DOE’s goal to advance the state of automotive technologies while minimizing the risk to the taxpayer. This requires that DOE balance its mission of fuel efficiency and against financial, market, technical and legal risks that may threaten the applicants’ ability to repay the loan. To the extent that the ATVM Loan Program, in its independent analysis, determines that any or all of the applicants will not achieve loan funding, we endeavor to provide clear feedback to the applicant.**

## **7) VACANCIES**

**Q7. According to Mr. Allison’s report, “some positions in LPO are either vacant or staffed by acting heads and rely heavily on consultants and contractors.”**

**Q7a. Which positions are currently vacant in the LPO? Which are staffed by acting heads?**

**A7a. The current LPO organizational model and staffing plan approved in December 2010 by the Secretary, the DOE Human Capital Officer (HC), and the collective bargaining unit allows for the recruitment and retention of federal employees compliant with Office of Personnel Management (OPM) requirements. Accordingly, the LPO mission and functions are aligned to the staffing plan which: establishes the**

roles and responsibilities for all new federal supervisors and staff; identifies their reporting structure, authorities, job classifications, and grade levels; and provides the framework for recruitment actions, which the LPO is undertaking in earnest with the HC organization.

The LPO organization is headed by the Executive Director (LP-1) who reports directly to the Secretary of Energy, and it has seven Divisions reporting to LP-1 including the:

- (1) *Loan Guarantee Origination Division (LP-10)* which manages all aspects of application intake, project evaluations, due diligence, environmental compliance, and origination and underwriting for all projects submitted under Title XVII loan guarantee authority;
- (2) *Advanced Technology Vehicle Manufacturing (ATVM) Division (LP-20)* which manages all aspects of ATVM loan origination for projects submitted under EISA Section 136 direct loan authority;
- (3) *Technical and Project Management Division (LP-30)* which evaluates the technical, scientific, and engineering eligibility and viability of all Title XVII and ATVM projects;
- (4) *Credit Division (LP-40)* which manages credit modeling, credit calculations, and risk analysis, Credit Committee, Credit Review Board, and interagency risk assessments and management for Title XVII and ATVM projects;



**(5) *Portfolio Management Division (LP-50)*** which provides portfolio monitoring and reporting, loan disbursement and repayment administration; and special assets management for Title XVII and ATVM projects.

**(6) *Management Operations Division (LP-60)*** which provides liaison, reporting, compliance, implementation, and management of the federal budget, contracts, personnel, information systems, correspondence, external communications, audits, safety, and security requirements for the LPO;

**(7) *Legal Division (LP-70)*** which reports to the DOE General Counsel and provides legal expertise on all transactions and loan agreements for Title XVII and ATVM projects.

The LPO staffing plan allows each Division to have a Director at the Senior Executive Service (or equivalent) level to establish, manage, and oversee LPO policy, procedures, and operations in coordination with LP-1. Currently there are three managers serving in an "Acting" capacity who function in "dual-hat" SES roles. They are: the Acting LP-1, who also serves as the LP-10 Director; the Acting LP-20 Director, who also serves as a Supervisory Senior Investment Officer; and the Acting LP-60 Director, who is also the Director for LPO Strategic Initiatives.

The LP-40 Director position that was mentioned in Mr. Allison's report is currently vacant. This position was advertised in January 2011 through a public notice on USAJobs, which is the OPM official federal job vacancy website. After a six-month recruitment effort, the competitive advertisement yielded no qualified candidates

for this position. This was likely due, in large part, to uncertainty surrounding the pending expiration of the LPO's Recovery Act authority. Since Mr. Allison's report was issued, the LPO has undertaken to revise this announcement to incorporate additional risk management functions identified in the report and is pursuing multiple notification strategies to advertise again for this position.

**Q7b. What is your plan, if any, to fill these positions?**

**A7b. The LPO is engaging in the recruitment for the LP-40 position under a revised framework. In addition, DOE is currently extending offers to eight new loan professionals for asset management and supervision in LP-50. At the same time, the LPO has initiated recruitment actions for specialists in loan administration, special assets, investment and financial analysis.**

As a federal executive agency governed by Title V of the U.S. Code, Government Organization and Employees, the LPO adheres to OPM and DOE personnel regulations that require competitive public postings for all federal vacancies. As a new organization, LPO recruitments have required significant advance work to create new federal positions in the specialized job series -- for investment officers and loan specialists with corporate and project finance qualifications -- which were not previously available at DOE. Combined with the timeframe required for OPM announcements, the LPO recruitment actions have typically taken six to eight months. The LPO continues working with the DOE Human Capital Office to determine ways to streamline the federal recruitment process to improve federal

hiring for the critical skills it requires. At the same time, LPO is trying to find ways to incentivize federal incumbents with specialized finance skills in a manner that is competitive with other federal finance organizations to ensure program stability and that it has the in-house competencies needed to meet its mission responsibly. These positions will be posted on USAJobs consistent with federal hiring requirements.

#### **8) ADDITIONAL SUBSIDY**

- Q8.** According to a memo written by administration officials Carol Browner, Ron Klain, and Larry Summers in October 2010, "Project sponsors for all power generation projects under the 1705 program have indicated that they intend to claim a 1603 grant once they enter into service."
- Q8a.** How many projects ultimately selected by DOE for Section 1705 loan guarantees have also claimed a 1603 grant (or will be eligible to do so before the 'Placed in Service' and 'Begun Construction' deadlines of October 1, 2012)?
- A8a.** As you know, the Department of Treasury is responsible for administering the 1603 program and the Investment Tax Credits (ITC). Under the 1705 loan program, the Department of Energy closed 26 transactions, excluding two transactions that withdrew subsequent to closing (POET and AES Energy Storage). Of the 26 transactions, 20 are expected to claim 1603 payments or ITC. The aggregate project cost for the 20 projects is \$22.8 billion and the aggregate expected 1603/ITC is \$5.9 billion or 26% of the project cost after allowing for ineligible costs.
- Q8b.** What is the total government subsidy (federal and state) for Section 1705 loan recipients, including 1603 grants, in dollars? Please provide this on a project-by-project basis and as an average across all projects.
- A8b.** The Department does not track state-level government subsidy. The Department cannot release the total project costs of specific projects as that is business sensitive

information and it cannot report on project specific 1603 data as that program is administered by the Department of Treasury. Currently most projects have not completed the 1603 process and been awarded 1603 payments but when those payments are awarded the payments will be public information and will be reported on the Treasury website.

**Q8c.** What is the total government subsidy for Section 1705 loan recipients, including 1603 grants, as a percentage of project cost? Please provide this on a project-by-project basis and as an average across all projects.

**A8c.** The Department can only report on 1603 grant recipients in terms of total government subsidy, not on a project specific basis although for projects that will be receiving 1603 payments, the information on such payments will be available on the Treasury website once the payment has been issued. The total aggregate expected 1603 award as a percentage of aggregate total project costs of the 26 projects (excluding the two that withdrew subsequent to closing) is 23.3%.

## **9) POWER PURCHASE AGREEMENTS AND LIABILITY**

**Q9.** A number of Section 1705 loan guarantees rely on power purchase agreements between the project sponsor and a utility.

**Q9a.** Have power purchase agreements been signed by all applicable parties (including agencies of the federal government) for all relevant Section 1705 loan guarantee projects? If not, why not, and when do you expect those agreements will be completed?

**A9a.** PPAs have been executed by all relevant parties for all but one of the Section 1705 energy generation projects. The one exception is Project Amp, which will deliver a PPA executed by all relevant parties before any disbursement occurs. Project Amp is designed to be completed in phases. Approval of a phase (and, therefore,

disbursement of loan proceeds in connection with a phase) requires a PPA executed by all relevant parties, including an investment grade utility offtaker.

A PPA, which is an agreement to buy generated power, is not relevant to Section 1705's non-generation projects, as there is no generated power to sell in those projects.

**Q9b. How is potential liability for damage caused to the grid in the event of a plant failure or malfunction addressed in power purchase agreements?**

**A9b. Measures designed to protect interconnecting high voltage transmission systems (i.e., "the grid") from power plant failures or malfunctions are generally addressed in interconnection agreements (rather than in Power Purchase Agreements) between the power plant's owner (the "Interconnection Customer"), the owner of the transmission facilities (the "Transmitting Organization") and the independent Regional Transmission Organization ("RTO"). As these are fairly standardized agreements, the information below is based on representative interconnection agreements from the California Independent System Operator ("CAISO") and ISO New England ("ISO-NE").**

Grid protective measures are more a technical issue than a legal one, as system technical standards are designed to prevent any power plant from causing damage to the grid. These standards are imposed legally by the interconnection agreement requirement that the Interconnection Customer design, construct and operate the power plant and appurtenant facilities in accordance with the applicable Reliability

**Council's requirements and "good utility practice." Each Interconnection Customer is, therefore, required to install and maintain protective equipment designed to prevent interference with, and damage to, the interconnected transmission facilities, as specified by "good utility practice" and the Transmitting Organization's standards. Before the in-service date and commercial operation of the power plant, the Transmitting Organization and Interconnection Customer are also required to perform complete calibration and function tests on the system protection facilities to ensure compliance with the specified standards.**

**In the event of emergency conditions, the RTO is separately authorized by the interconnection agreement to shut down transmission from the power plant without notice and to take any other actions to preserve public health and safety, preserve the reliability of the RTO-controlled grid or the Transmitting Organization's interconnection facilities and distribution system, to limit or prevent damage, and to expedite restoration of service.**

**From a legal perspective, the interconnection agreements generally provide that the RTO, Transmitting Organization and Interconnection Customer indemnify each other from all losses arising out of another party's actions or inactions under the interconnection agreement, except in cases of gross negligence or intentional wrongdoing by the indemnified party. Liability for consequential, indirect or punitive damages is generally excluded in the interconnection agreements. The Transmitting Organization and Interconnection Customer are also required by the**

**interconnection agreement to maintain minimum insurance coverage, including excess public liability insurance over and above general commercial liability policies.**

## **QUESTIONS FROM SENATOR AL FRANKEN**

- Q1. How many companies whose technologies have received Department of Energy support through grants, public-private partnerships (such as the NP2010 program), loans, or loan guarantees have transferred that technology (i.e., intellectual property or trade secrets) to China in the past ten years?**
- A1. The Department of Energy does not centrally collect information about companies that have received DOE support and have transferred that technology to China.**
- Q2. Please provide the names of all companies that have at any time over the past ten years transferred technology to China subsequent to Department of Energy support for the technology through grants, public-private partnerships, loans, or loan guarantees.**
- A2. The Department of Energy does not centrally collect information about companies that have received DOE support and have transferred that technology to China.**
- Q3. Please provide any relevant information on particular support programs that the above-mentioned companies and technologies received.**
- A3. The Department of Energy does not centrally collect information about companies that have received DOE support and have transferred that technology to China.**
- Q4. Please provide a general description of the technology that was supported by the Department of Energy and subsequently transferred to China.**
- A4. The Department of Energy does not centrally collect information about companies that have received DOE support and have transferred that technology to China.**





**Department of Energy**  
Washington, DC 20585

July 20, 2012

The Honorable Andy Harris  
Chairman  
Subcommittee on Energy and the Environment  
Committee on Science, Space, and Technology  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On May 10, 2012, Charles McConnell, Assistant Secretary, Office of Fossil Energy, testified regarding examining the challenges and opportunities associated with expanding development and use of unconventional oil and gas production technologies.

Enclosed are the answers to seven questions that you submitted for the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in cursive script, reading "Christopher Davis", is positioned above the printed name.

Christopher Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental  
Affairs

Enclosures



## **QUESTION FROM CHAIRMAN ANDY HARRIS**

**Q1. Please provide an update on the status of the recommendations contained in the Strategic Unconventional Fuel Task Force's "Strategy and Program Plan."**

**What has the Department of Energy specifically done to address each of the challenges and recommendations contained in the plan?**

**A1. To address the challenges and recommendations of the Strategic Unconventional Fuel Task Force, the Department led an effort in 2007 and 2008 that resulted in the development, publication, and distribution of a Strategic Plan for Unconventional Fuels Development in the Western Energy Corridor. The Strategic Plan was developed jointly by an ad hoc group of representatives from the Department of Energy (including national laboratories), Department of Defense, Department of the Interior, affected state and local government entities, universities, and industry representatives from the U.S. and Canada. The Department has also been developing, publishing and distributing multiple reports that track research, development, and demonstration (RD&D) efforts in the private and public sectors in the U.S.; and participating in national and international oil shale conferences.**

## QUESTION FROM CHAIRMAN ANDY HARRIS

**Q2a.** Please provide an update on the activities of the Strategic and Unconventional Fuel Task Force. For example, how often does the Task Force meet and when was the most recent Task Force meeting? Is the Task Force producing reports as required by Section 369 of the Energy Policy Act of 2005?

Specifically, what is the Department of Energy's current role in the Task Force?

**A2a.** The Task Force met prior to January 2008 and approximately 10 times between January 2008 and the last meeting in April 2010. The Task Force completed a report, entitled *Initial Findings and Recommendations of the Strategic Unconventional Fuels Task Force* in September 2006. With assistance from the Department, the Task Force also completed a Strategy and Program Plan report, entitled *America's Strategic Unconventional Fuels*, in September 2007. These two reports fulfilled the Task Force's reporting responsibilities under section 369(h) of the Energy Policy Act of 2005 (EPAAct 2005).

Additionally, pursuant to section 369(h)(5)(b) of EPAAct 2005, the Department was required to "provide an annual report describing the progress in developing the strategic unconventional fuels resources within the United States for each of the five years following submission of the" Task Force's Initial Report. The Department accordingly submitted an annual report for 2008 on January 16, 2009 for the three-year period covering 2006 through 2008; and another annual report for 2009 was submitted on June 18, 2010.

The Department's current focus is primarily on safe and environmentally sustainable development unconventional natural gas, including shale gas, and methane hydrates. The Department does not have a current role with regard to the Task Force because all of the Task Force's reporting requirements pursuant to EPCA 2005 Section 369(h) have been met and the Task Force is not currently producing any additional studies; accordingly, the Department is not planning to submit additional annual reports.

## **QUESTION FROM CHAIRMAN ANDY HARRIS**

**Q2b. Please provide an update on the activities of the Strategic and Unconventional Fuel Task Force. For example, how often does the Task Force meet and when was the most recent Task Force meeting? Is the Task Force producing reports as required by Section 369 of the Energy Policy Act of 2005?**

**Why has the Task Force not issued an annual report, as required by law, since 2009? Is DOE committed to the Task Force completing the required reports?**

**A2b. The Task Force produced an Initial Report in September 2006. EPLA 2005 did not call upon the Task Force to produce additional reports. However, with assistance from the Department, the Task Force also completed a Strategy and Program Plan report in September 2007. Additionally, the Department submitted an annual report on January 16, 2009 for the three-year period covering 2006 through 2008; and another annual report for 2009 was submitted on June 18, 2010. The Task Force has not produced any additional studies since its last meeting in April 2010; and the Department is not planning to submit additional annual reports.**

## **QUESTION FROM CHAIRMAN ANDY HARRIS**

**Q2c. Please provide an update on the activities of the Strategic and Unconventional Fuel Task Force. For example, how often does the Task Force meet and when was the most recent Task Force meeting? Is the Task Force producing reports as required by Section 369 of the Energy Policy Act of 2005?**

**Please provide a timeline to the Subcommittee for the Task Force to issue an updated Annual Report.**

**A2c. The Task Force's reporting requirements pursuant to EPAct 2005 Section 369(h) have been met; the Task Force has not produced any additional studies since its last meeting in April 2010; and the Department is not planning to update previous annual reports.**

**QUESTION FROM CHAIRMAN ANDY HARRIS**

**Q2d. Please provide an update on the activities of the Strategic and Unconventional Fuel Task Force. For example, how often does the Task Force meet and when was the most recent Task Force meeting? Is the Task Force producing reports as required by Section 369 of the Energy Policy Act of 2005?**

**Does DOE have plans to implement the recommended unconventional fuels strategy, proposed by the Ad Hoc Unconventional Fuels Working Group?**

**A2d. Our current focus is primarily on safe and environmentally sustainable development of unconventional natural gas, including shale gas, and methane hydrates.**

**QUESTION FROM CHAIRMAN ANDY HARRIS**

**Q3. How is the Department of Energy actively fulfilling its program responsibilities called for in Section 369 of the Energy Policy Act of 2005?**

**What plans does the Office of Fossil Energy have for further supporting oil shale development as part of the Energy Policy Act 2005?**

**A3. Our current focus is primarily on safe and environmentally sustainable development of unconventional natural gas, including shale gas, and methane hydrates. The Department's oil shale activities going forward include efforts to track RD&D in the public and private sectors; and to participate in oil shale conferences.**



## QUESTION FROM CHAIRMAN ANDY HARRIS

**Q4. During the hearing, you stated that both oil shale and oil sands are part of President Obama's "all-of-the-above" energy strategy. If this is truly the case, why does the budget request for the Department of Energy's Office of Fossil Energy contain no funding for oil shale and oil sands research?**

**A4. America's abundant unconventional oil (including oil shale) and natural gas resources are critical components of our nation's energy portfolio. Their development enhances America's energy security and economy.**

**However, there are significant technical and environmental challenges to the development of U.S. oil shale. The more difficult issues related to the commercialization of domestic oil shale appear to be related to high capital costs, uncertainties regarding oil shale development regulations, and most importantly, environmental considerations, rather than process-related technical challenges.**

**Our current research focus is primarily on safe and environmentally sustainable development of low-carbon unconventional natural gas. This includes shale gas, and methane hydrates.**

**QUESTION FROM CHAIRMAN ANDY HARRIS**

**Q5. Please describe all activities specifically relating to oil shale development within Department of Energy's Office of Fossil Energy.**

**What is the Department of Energy specifically doing to address water-use issues associated with unconventional energy production?**

**A5. DOE's Office of Oil and Gas supports research and development (R&D) efforts addressing the water use, water re-use/recycling, wastewater treatment, and water resource management issues associated with the development of unconventional resources, including oil shale. Examples of such DOE sponsored projects specific to oil shale include: (a) the development and creation of an up-to-date Geographic Information System (GIS) database that will provide baseline water information needed to understand potential impacts of future oil shale development, which is being conducted by a team led by the Utah Geological Survey; and (b) development of a web-based water resource geospatial data gathering and analysis system to facilitate decision making for potential oil shale development, which is being conducted by the Colorado School of Mines.**

**QUESTION FROM CHAIRMAN ANDY HARRIS**

- Q6.** In the Department of Energy's response to the Government Accountability Office report "*Energy-Water Nexus: A Better and Coordinated Understanding of Water Resources Could Help Mitigate the Impacts of Potential Oil Shale Development*," DOE states, "the biggest obstacles to investment in the development of a viable oil shale industry in the US have not been the state of the technology, but rather the regulatory uncertainty, and lack of access to resources on Federal lands in the western US." Does DOE stand by this assessment? If so, what is DOE doing to help overcome these obstacles?
- A6.** The Department of Energy (DOE) believes the issues of regulatory certainty and access to resources will be resolved by ongoing Bureau of Land Management initiatives. In the meantime, DOE's main focus will be on safe and environmentally sustainable development of unconventional natural gas, including shale gas, and methane hydrates.

## **QUESTION FROM CHAIRMAN ANDY HARRIS**

- Q7. The House Appropriations Committee provides \$25 million to the Department of Energy's Office of Fossil Energy for unconventional fossil energy research to support research to improve the economics of oil production from oil shale, as well as to reduce the health, safety, and environmental risks associated with oil shale extraction. Does DOE support this funding? If not, why not?**

**If Congress appropriates this funding, what targeted research areas would be the most impactful for the development of the United States' unconventional energy resources?**

- A7. The Department supports the President's Budget as submitted, which will focus primarily on safe and environmentally sustainable development of unconventional natural gas, including shale gas, and methane hydrates.**



**Department of Energy**  
Washington, DC 20585

August 3, 2012

The Honorable Ed Whitfield  
Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On May 9, 2012, Patricia Hoffman, Assistant Secretary, Office of Electricity Delivery and Energy Reliability, testified regarding "The American Energy Initiative" – H.R. 4273, the "Resolving Environmental and Grid Reliability Conflicts Act of 2012" and H.R. \_\_\_, the "Hydropower Regulatory Efficiency Act of 2012".

Enclosed is the answer to one question that was submitted by Representative Dingell to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Davis", is written over the word "for".

Christopher Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental  
Affairs

Enclosure

cc: Bobby L. Rush, Ranking Member, Subcommittee on Energy and Power



## QUESTION FROM REPRESENTATIVE DINGELL

**Q1. Is there relief that can be given to utilities under existing law?**

**A1. The Department of Energy has broad authority under section 202(c) of the Federal Power Act to order a generator to operate in order to alleviate an emergency situation. The Federal Power Act itself, however, does not contain an explicit mechanism for “relief” of a utility in the hypothetical circumstance where compliance with the terms of a section 202(c) order unavoidably results in violation of a governing requirement under the environmental laws, such as emission limitations in a permit issued under the Clean Air Act. Beyond the Federal Power Act, relevant environmental statutes may provide additional flexibility to address or avoid potential compliance violations, depending on the situation and the applicable requirements. To date, DOE has received only one section 202(c) petition in which environmental compliance played a role. In that case, the Department was able to issue an order relieving emergency reliability conditions without placing the affected utility in a conflict with environmental law.**

In August 2005 the Mirant Potomac River Generating Station ceased operations after receiving a letter from the Virginia Department of Environmental Quality (DEQ) regarding mitigating modeled exceedances of national ambient air quality standards. In response to Mirant’s decision, the District of Columbia Public Service Commission requested that the Secretary of Energy issue a 202(c) emergency order requiring the operation of the Mirant generating station in order to ensure compliance with electric reliability standards for the central D.C. area.

Pursuant to that request, DOE conducted an independent analysis of the electricity reliability situation in the central D.C. area and analyzed the plant's role in ensuring a sufficiently reliable supply of electricity to that area. Based on that analysis, DOE determined that without the operation of the Potomac River generating station there was a reasonable possibility an outage would occur that would cause a blackout in the central D.C. area. Therefore, on December 20, 2005, DOE issued a 202(c) emergency order requiring Mirant to operate the station. Prior to and after the issuance of that order, DOE worked closely with the United States Environmental Protection Agency and the Virginia Department of Environmental Quality to coordinate efforts to provide operational scenarios for the plant that provided electric reliability to the Central D.C. area while not causing modeled NAAQS violations. Through this means, compliance by Mirant with the provisions of the 202(c) order itself would still enable compliance with the environmental law obligations because the 202(c) order itself was crafted to avoid such violations. DOE's order was designed to avoid requiring action by Mirant that would result in violation of environmental law.

DOE and EPA have consulted regarding the potential effect of EPA regulations on electric reliability and possibilities to mitigate any such effects. Given the flexibilities and time afforded for compliance under the EPA regulations issued to date, the Department expects that emergency circumstances necessary to exercise authority under section 202(c) stemming from EPA rules will be rare and only invoked as a last resort. DOE is committed to working with stakeholders to maintain grid reliability while and

ensuring environmental protection. With cooperation, existing statutes and regulations should be sufficient to address any grid reliability concerns.





**Department of Energy**  
Washington, DC 20585

August 6, 2012

The Honorable Ralph M. Hall  
Chairman  
Committee on Science, Space, and Technology  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On March 1, 2012, Secretary Steven Chu testified regarding "*An Overview of the Department of Energy's Research and Development Budget for Fiscal Year 2013.*"

Enclosed are the answers to 33 questions that Representatives Neugebauer, Lipinski, Lujan, McNerney, Miller, and you submitted to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher Davis", is positioned above the printed name.

Christopher Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental  
Affairs

Enclosures

cc: The Honorable Eddie Bernice Johnson, Ranking Member



**U.S. HOUSE OF REPRESENTATIVES  
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY**

**Questions for the Record**

***An Overview of the Department of Energy Research and Development Budget  
For Fiscal Year 2013***

**Thursday, March 1, 2012**

**9:30 a.m. to 12:00 p.m.**

**2318      Rayburn House Office Building**

## QUESTION FROM REPRESENTATIVE HALL

**Q1. President Obama recently said we could replace “up to 17 percent of the oil we import for transportation” with algae.**

**a. What is the approximate equivalent cost of a gallon of algae-based fuel right now, and how long does DOE believe it will take to be economically competitive with oil?**

**A1a. In addition to cellulosic biomass materials, algae can be a sustainable feedstock to replace petroleum-based fuels like diesel and jet fuels. DOE is currently sponsoring research and development (R&D) at labs and universities and is building first-of-a-kind pilot facilities with Sapphire and Algenol to validate feasibility. However, current costs need to be reduced by 3 to 5 times to be economically competitive. Economic competitiveness depends on both technology readiness (including how well the scale and continuous operations risks are addressed) and the cost of capital to construct and operate based on a reasonable rate of return on investment. Because there is no industry consensus on many of these factors, the projected costs of algal biofuels can vary dramatically.**

**Many factors go into cost per gallon of algal biofuels analyses, including but not limited to:**

- (1) The type of facility envisioned (i.e. open reactors versus closed photobioreactors versus heterotrophic reactors; briny water versus freshwater; evaporative harvesting versus dissolved air flotation harvesting; dry extraction versus wet extraction; trans-esterification versus hydrotreating conversion);**
- (2) The envisioned scale of the algae production and conversion facility;**

- (3) The annual areal productivity of the cultivated algae;
- (4) The appropriate values of any co-products (i.e. fish/shrimp meal) or co-services (i.e. CO<sub>2</sub> credit, wastewater remediation) generated alongside algal biofuels as additional revenue streams; and
- (5) The type of desired fuel end product, such as hydrotreated renewable jet (HRJ) fuel or biodiesel.

Just as the cost projections vary, the estimates of the time to commercial readiness vary depending on the type of algae process. For a heterotrophic algae process that is based on well-characterized continuous fermentations, the timeline to being economically competitive against oil on a technology readiness basis is expected to be shorter than an open pond or closed photoreactor based process. Individually, each of these producers may find niche opportunities that allow them to offer fuels on a cost-competitiveness basis due to certain co-products or co-services credits. DOE believes it will take more than 10 years for algal biofuels to be economically competitive with oil at the 1-5 billion gallon scale envisioned by the Energy Independence and Security Act (EISA) of 2007 Renewable Fuel Standard.

- b. Please provide a description, including activities and funding, for DOE-supported research on algae-based fuel over the last forty years.

A1b. DOE-supported applied research on algal biofuels began in the 1970's with the Office of Fuels Development's Aquatic Species Program (ASP), which focused on the production of biodiesel from lipid-producing microalgae. The research thrusts during the ASP included studies on applied biology, algae production systems innovations, and resource

availabilities analyses. The results from the 18 years of the ASP are summarized in the 294-page NREL Report (TP-580-24190), titled “A Look Back at the U.S. Department of Energy’s Aquatic Species Program: Biodiesel from Algae”.<sup>1</sup>

DOE’s Biomass Program renewed its RD&D efforts on algal biofuels in 2008 by convening leading researchers and commercial entities at the National Algal Biofuels Technology Roadmap Workshop. The workshop highlighted analysis gaps and technology development opportunities that were the subjects of a competitive solicitation on an R&D consortium released in FY2009 with \$49 million dollars of DOE investment from the American Reinvestment and Recovery Act. The awardee, the National Alliance for Advanced Biofuels and Bioproducts (NAABB) algae consortium, is led by the Donald Danforth Plant Sciences Institute and consists of multidisciplinary researchers from 37 different U.S. institutions who are focusing on algal biology, cultivation, harvesting, extraction, conversion and end-use.

The Recovery Act also allowed the Biomass Program to invest in three algae pilot and demonstration-scale integrated biorefineries- Sapphire Energy Inc., Algenol I.L.C, and Solazyme Inc., at DOE funding shares of \$50 million, \$25 million, and \$22 million, respectively. Sapphire focuses on an open pond based approach to cultivate algae, while Algenol is pursuing a closed photobioreactor. Both companies use photosynthetic algae, as opposed to Solazyme, which is pursuing a heterotrophic fermentation approach.

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<sup>1</sup> For a copy of the report, please download from <http://www.nrel.gov/docs/legosti/fy98/24190.pdf>

From FY2010 through FY2011, the DOE Biomass Program supported additional R&D projects, of which 31 were reviewed at the Algae Platform Peer Review. For these projects, the requested information is summarized below in Table 1.

During this time, a number of other DOE projects on algae were funded from the DOE Office of Fossil Energy, DOE ARPA-E, and DOE Office of Science, including beneficial CO<sub>2</sub> reuse in oil producing algae, genetic pathways identification for algae hydrocarbon production, and dewatering technologies.

**Table 1. Summary of DOE Biomass Program Active Algae Projects from FY2010 to FY2011**

Project Title	Presenter	Performing Organization	Project Type	Approximate DOE Share
NAABB An Algal Biofuels Consortium	Jose Olivares	Los Alamos National Laboratory	Consortium	\$49M
Algal Biofuels via Innovative Harvesting and Aquaculture Systems	Jeff Kanel	Renewable Algal Energy	Feedstock Logistics	\$1.5M
Large-Scale Production of Fuels and Feed from Marine Microalgae	Jeff Obbard	Cellana	Consortium	\$9M
Sustainable Algal Biofuels Consortium	John McGowen	Arizona State University	Consortium	\$6M
Consortium for Algal Biofuels Commercialization	Paul Falkowski	CABComm	Consortium	\$9M
Research for Developing Renewable Biofuels from Algae	George Oyler	University of Nebraska Lincoln	Congressionally Directed Funding	\$1.9M
Algal Biofuel Pathway Baseline Costs	Andy Aden	NREL	Analysis & Sustainability	Less than \$1M
Algae Life Cycle Assessment with GREET	Ed Frank	Argonne National Lab	Analysis & Sustainability	Less than \$1M
Development of Renewable Biofuels Technology by Transcriptomic Analysis and Metabolic Engineering of Diatoms	Mark Hildebrand	University of California - San Diego	Feedstock Production	Less than \$1M

Improving cost effectiveness of algae-lipid production through advances in nutrient delivery and processing systems	K.C. Das	University of Georgia	Feedstock Production	Less than \$1M
Production of higher alcohols liquid biofuel via acidogenic digestion and chemical upgrading of industrial biomass streams.	Peter van Walsum	University of Maine	Conversion	Less than \$1M
Extremophilic Microalgae: Advanced Lipid and Biomass Production for Biofuels and Bioproducts	Brent Peyton	Montana State University	Feedstock Production	Less than \$1M
Macroalgae GIS Analysis	Guri Roesijadi	Pacific Northwest National Laboratory	Analysis & Sustainability	Less than \$1M
Microalgae Analysis	Mark Wigmosta	PNNL	Analysis & Sustainability	Less than \$1M
Algae-Based Biofuels Integrated Assessment Framework: Development, Evaluation, and Demonstration	Deborah Newby	INL	Analysis & Sustainability	Less than \$1M
Collaborative: Algae-based Integrated Assessment Framework	Richard Skaggs	PNNL	Analysis & Sustainability	Less than \$1M
US-Israel Algal Biofuels (NREL)	Robert Baldwin	National Renewable Energy Lab	Analysis & Sustainability	Less than \$1M
Pond to Wheels Algae Biodiesel Life Cycle Assessment	Howard Passell	Sandia National Labs	Analysis & Sustainability	Less than \$1M
New technology: Improving Microalgal Oil Production Based on Quantitative Analysis of Metabolism	Jorg Schwender	Brookhaven National Laboratory	Feedstock Production	Less than \$1M
Microalgae Harvesting/Dewatering and Drying	Deborah Newby	INL	Feedstock Logistics	Less than \$1M
Efficient use of algal biomass residues for biopower production with nutrient recycle	Eric Jarvis	National Renewable Energy Laboratory	Feedstock Production	Less than \$1M
Pond Crash Forensics	Todd Lane	Sandia National Laboratories	Feedstock Production	Less than \$1M
Human Health Risk Assessment of Algal Production Systems: Toxins and Toxic Components, Harmful VOCs, Metal Speciation/Bioconcentration, and Pathogenic Microorganisms	Chris Yeager	SRNL	Analysis & Sustainability	Less than \$1M

Associated with Large-Scale Algae Cultivation Systems				
Human Health Risk Assessment of Algal Production Systems: Toxins and Toxic Components, Harmful VOCs, Metal Speciation/Bioconcentration, and Pathogenic Microorganisms Associated with Large-Scale Algae Cultivation-LANL WBS#9.6.1.7	Enid (Jeri) Sullivan	Los Alamos National Laboratory	Analysis & Sustainability	Less than \$1M
Algal-Based Renewable Energy for Nevada	Christian Fritsen	Desert Research Institute	Congressionally Directed Funding	\$1.5M
Development of Pollution Prevention Technologies	Juergen Polle	Brooklyn College	Congressionally Directed Funding	Less than \$1M
Exploiting aquatic flowering plants (duckweed) as a source of bioenergy	Rob Martienssen	Cold Spring Harbor Laboratory	Congressionally Directed Funding	\$2.8M
Developing new alternative energy in Virginia: Bio-diesel algae	Patrick Hatcher	Old Dominion University	Congressionally Directed Funding	Less than \$1M
US-Canada Algal Biofuels Partnership	Philip Pienkos	NREL	Feedstock Production	Less than \$1M
Modeling and Visualizing Algae Biofuel Production Potential in Canada	Howard Passell	Sandia National Labs	Analysis & Sustainability	Less than \$1M
Canada Algal Collaboration-PNNL	Jon Magnuson	PNNL	Conversion Interface	Less than \$1M

c. Please also describe the focus and objectives associated with the \$14 million in algae R&D funding proposed by the President in February.

A1c. DOE issued a competitive funding opportunity announcement, titled “Advancements in Sustainable Algal Production” (ASAP) to accelerate efforts to increase the scalability of algae production. Awards made as a result of this Funding Opportunity Announcement (FOA) will support achieving the Biomass Program’s mission to transform the nation’s renewable biomass into sustainable and cost-competitive biofuels. Projects will be funded with up to \$14 million of FY2012 appropriations. Upon successful completion of go/no-go evaluations and contingent upon both the availability of funds and the continued



alignment of project scope to DOE priorities, select projects may receive additional funds to continue past the initial performance periods.

The ASAP FOA outlines two Topic Areas: (1) Innovative technologies to reduce water and nutrients, and (2) Regional Algal Feedstock Testbed (RAFT) Partnerships. The RAFT Partnerships are to carry out the following functions: (1) develop user facilities that serve as engines for algal technology innovation and validation, and (2) create regional, long-term cultivation data necessary to understand and validate algae biomass production.

In addition to the \$14 million to fund competitively selected projects from the ASAP FOA, the FY2012 budget includes an additional \$15.3 million for algae research, development and demonstration activities. These funds support additional algae technology development and analytical efforts being conducted by the DOE National Laboratories, an innovative algal harvesting technology being pursued by a small business based in Kingston, Tennessee that was originally selected under the DOE SBIR/STTR Phase III Xcelerator initiative, a project anticipated to be selected from an R&D solicitation for innovations in Photosynthetic Biorefineries that leverages NSF funding, and a project anticipated to be selected under the recent Bio-Oil Stabilization and Commoditization Funding Opportunity Announcement (FOA) aimed at improving the infrastructure compatibility of algal bio-oils with existing refineries.

In FY 2013, the Biomass Program requested appropriations to support the issuance of a new FOA aimed to improve algal strain robustness and productivity, as well as to improve algal harvesting/dewatering efficiency. These R&D objectives were identified as

barriers in the National Algal Biofuels Technology Roadmap document. The need for continued innovations in these particular areas is confirmed by research reports, as well as initial resource, techno-economic, and lifecycle findings.

## QUESTION FROM REPRESENTATIVE HALL

- Q2.** In response to a question regarding DOE's issuance of a loan guarantee to Prologis, you were asked if there was a "breakthrough new technology involved" to which you responded "no." You later stated you "thought it was a very, very good business model to put wholesale generation of electricity on warehouse rooftops" and Prologis was an "innovation in a business model."

Please describe in detail why the private sector would not back the "very, very good business model" such as that proposed by Prologis, and why taxpayer dollars should be risked deploying established and widely available technologies.

- A2.** Project Amp is mostly supported by private sector financing unguaranteed by DOE. 55 percent of all of the project's costs will be borne by private equity and 20 percent of the debt will be unguaranteed. Therefore, approximately 2/3rds of the project's costs will be provided by the private sector.

The DOE loan guarantee was awarded to Project Amp under authority provided by Sec. 406 of the American Recovery and Reinvestment Act of 2009 which amended Title XVII of the Energy Policy Act of 2005. The amendment, Sec. 1705, established a temporary program for the rapid deployment of renewable energy and electric power transmission projects, notwithstanding Sec. 1703. While the Sec. 1705 portfolio of loans supports a mixture of innovate and commercial technologies, the program has facilitated the rapid deployment of renewable energy and electric transmission projects consistent with statute.

- Project Amp's financing structure requires each of its phases to meet stringent credit requirements. It also continuously enhances the credit of the project through the cross-collateralization of all of the installations selling power to investment grade utilities. The

**successful example of Project Amp will serve as a springboard for future utility-scale distributed solar development.**

### QUESTION FROM REPRESENTATIVE HALL

- Q3. The first recommendation from the Blue Ribbon Commission on America's Nuclear Future was to pursue a "consent-based siting process." On March 6, 2012, the Nye County, NV Board of County Commissioners—the local government authority where Yucca Mountain is located—sent you a letter requesting consideration to host a permanent repository for high-level radiological waste. Further, a recent poll suggested 62 percent of Nevadans would support the use of Yucca Mountain for research purposes. Given the consent of the local stakeholders, will you commit to working with the Nye County Board of Commissioners to open Yucca Mountain, as a part of a consent-based process? Does DOE consider Yucca Mountain a potential interim storage site option? If not, why not?**
- A3. The Administration is giving full consideration to the BRC recommendations as we work to define a path forward. The Administration will be providing additional information later this year, and will work with Congress to implement a new strategy to manage our nation's used nuclear fuel and nuclear waste.**

#### QUESTION FROM REPRESENTATIVE HALL

**Q4. Your testimony stated that the President's budget eliminates \$4 billion in "inefficient and unnecessary" subsidies to the oil and gas industry.**

- a. How much of the \$4 billion you reference is estimated to come from the "Section 199" provision that allows deductions for domestic manufacturing? Please also describe and quantify the tax provisions that comprise the remainder.**

**A4a. Eliminating the manufacturing tax deduction for oil/gas for FY 2013 would account for \$574 million of \$4.753 billion in tax savings identified in the President's Budget.**

**For FY 2013 all the oil/gas tax changes (and their revenue impacts) are:**

<b>1. Repeal Enhanced Oil Recovery Credit</b>	<b>(0)</b>
<b>2. Repeal Credit for Oil and Gas Produced from Marginal Wells</b>	<b>(0)</b>
<b>3. Repeal Expensing of Intangible Drilling Costs</b>	<b>(\$3,490)</b>
<b>4. Repeal Deduction for Tertiary Injectants</b>	<b>(\$7)</b>
<b>5. Repeal Exception to Passive Loss Limitations for Working Interests in Oil and Natural Gas Properties</b>	<b>(\$9)</b>
<b>6. Repeal Percentage Depletion for Oil and Natural Gas Wells</b>	<b>(\$612)</b>
<b>7. Repeal Domestic Manufacturing Tax Deduction for Oil and Natural Gas Companies</b>	<b>(\$574)</b>
<b>8. Increase Geological and Geophysical Amortization Period for Independent Producers to Seven Years.</b>	<b><u>(\$61)</u></b>
<b>TOTAL FOR 2013 (\$ million)</b>	<b>(\$4,753)</b>

- b. Is the oil and gas industry uniquely eligible for the Section 199 deduction, or are other sectors of the economy eligible as well? If the latter, approximately what percentage of the overall cost of the deduction is claimed by the oil and gas industry, versus all other sectors of the economy?**

**A4b. The deduction applies to all qualifying manufacturing industries. Eliminating this deduction for oil and gas companies would increase tax revenues by \$574 million for that year.**

- c. If all companies that undertake domestic manufacturing are eligible for this deduction, does the Administration support eliminating the deductions to all companies, or just those involved in oil and gas?

**A4c. The proposed elimination of the domestic deduction for manufacturing activities applies only to fossil fuel industries. It would remain intact for all other qualifying industries.**

## QUESTION FROM REPRESENTATIVE HALL

- Q5. The Keystone XL Pipeline would deliver an estimated 830,000 barrels of oil per day to U.S. refineries, greatly alleviating pressures that contribute to current high gas prices. Unfortunately the President rejected the pipeline in January, citing environmental concerns. Specifically, the President's statement rejecting construction of the pipeline said that "Congressional Republicans prevented a full assessment of the pipeline's impact, especially the health and safety of the American people, as well as our environment." This objection appears to be centered on the technical question of whether the pipeline can be built safely.**

**To this end, please describe DOE's involvement in sharing input and advice related to the President's decision to reject construction of the Keystone XL Pipeline. Please also provide your current assessment of the pipeline's impact on the health and safety of the American people, as well as the environment. Are there any potential environmental or technical issues associated with the pipeline that cannot be addressed?**

- A5. DOE provided information to the State Department concerning the potential impact of the Keystone XL pipeline proposal on U.S. oil imports from Canada and other countries, use of Canadian oil within each of the five Petroleum Administration for Defense Districts (PADDs) and world-wide greenhouse gas emissions. DOE's input is referenced in the draft and final Environmental Impact Statement (EIS). DOE did not assess the potential environmental or technical issues associated with the pipeline and does not have any analytical judgments on those matters, which are properly the purview of an EIS and within the purview of the State Department.**



## QUESTION FROM REPRESENTATIVE HALL

- Q6. In his State of the Union address, President Obama said “This country needs an all-out, all-of-the-above strategy that develops every available source of American energy.”**

**Three days later, the Administration announced it was blocking the development of oil shale on over a million acres of Federal lands. The land had been opened for development by the Bush Administration and is estimated to contain more oil than Saudi Arabia’s proven reserves, but was declared off-limits by the Obama Administration.**

**Please explain why oil shale is not part of the Administration’s “all-of-the-above” strategy, and how the strategy can be reasonably described as “all-of-the-above” when such immense resources are excluded?**

- A6. Oil shale holds the potential to be a significant component of our Nation’s energy portfolio, but a number of economic, technical, and environmental questions need to be addressed before commercial-scale development takes place on Federal lands. The Department of the Interior has issued a series of leases for oil shale research, development, and demonstration projects on Federal lands. As these projects progress, we hope to better understand the feasibility and impacts of large-scale oil shale development. This information will be used to inform decisions about future commercial leasing.**

## QUESTION FROM REPRESENTATIVE HALL

**Q7. President Obama recently gave a speech on gas prices in which he said “I have directed my administration to look for every single area where we can make an impact and help consumers in the months ahead.” Please reconcile this statement with the Administration’s proposal to eliminate \$50 million in R&D funding aimed at expanding safe production of oil and gas. This program (known as the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Resources), supports development of next-generation technologies important to ensuring domestic production of oil and gas is maintained and even increased. The program was highlighted by the Secretary of Energy Advisory Board (SEAB) as an effective program that should be enhanced and supported.**

**If the President truly wants to support “every single area” that could lead to lower gas prices and increased energy production, why is he proposing to eliminate this R&D program?**

**A7. Mandatory R&D funding from EPCA Sec. 999 is too inflexible a mechanism to adequately address environmental and safety concerns in the dynamic and rapidly evolving hydraulic fracturing space. The Administration has sought to refocus this funding to support research with significant potential public benefits, including activities consistent with high priority Secretary of Energy Advisory Board recommendations.**

## QUESTION FROM REPRESENTATIVE HALL

**Q8.** After a year of investigation, details surrounding the Solyndra loan guarantee are still coming to light. Publicly released documents show you personally intervened to advance a loan guarantee to Prologis Last June, as Solyndra's extreme financial difficulties were becoming apparent. Prologis' loan guarantee provided an avenue to advance its "Project Amp" which coincidentally purchased solar panels from Solyndra.

In an email between a Solyndra employee and its financiers, the Solyndra employee stated "on three occasions this week he thought that the [Project Amp] deal was dead, but Secretary Chu personally pulled it off. Chu shared with the team that this deal went to higher levels in the Obama Administration to gain approval than any other transaction in the Loan Guarantee Program and that he personally committed to seeing it through to a successful conclusion."

**8a.** What specific actions did you take regarding this loan guarantee that you did not for others, and why did you give special treatment to the Prologis Project Amp proposal?

**A8a.** Secretary Chu's decision to support Project Amp was not related to Solyndra or any other solar panel manufacturers that may eventually supply this project. The reason for Secretary Chu's interest in Project Amp should be clear: it is the largest rooftop solar undertaking in U.S. history; it is expected to generate enough renewable electricity to power over 88,000 homes; it will support over one thousand jobs across the country; and it has the potential to revolutionize the way rooftop solar is deployed in the United States. Congress directed the Department to support just such projects under the Recovery Act's Sec. 1705 loan program.

DOE has not been alone in its support of Project Amp. Through the use of DOE's Financial Institution Partnership Program (FIPP), Project Amp was able to attract private sector support from Bank of America Merrill Lynch. NRG Energy, one of the Nation's largest and most respected electric power companies, has committed to fund (with Prologis) the equity required during the first 18 months of the project.

While Solyndra was an early partner with Prologis and was a potential panel supplier for a small initial phase of Project Amp, DOE was not involved in Prologis' decision to purchase panels from Solyndra. Moreover, this arrangement ultimately was intended to represent only approximately 15MW of the 733 MW of Project Amp and was contemplated long before the Project Amp application was submitted to DOE. Similarly, the Department's interest in Project Amp was not in any way diminished when Solyndra filed for bankruptcy and Prologis decided not to use Solyndra panels for the first phase of the project. Once Prologis notified DOE of its proposed change, the Department lent Prologis its full support, bringing the new information to DOE's Credit Review Board expeditiously, and the Board confirmed its recommendation to support the Project.

Secretary Chu did participate in high-level policy discussions around the Amp transaction regarding the transaction's consistency with the Recovery Act's policy objectives. While the proposed transaction included a five-year draw period, the transaction that closed has a four-year draw period, aligning the transaction more closely the Recovery Act's objectives. This change was the result of interagency policy discussions at the principal level.

8b. Please describe the differences associated with the level of involvement of senior DOE and White House political officials in the Prologis loan process, and explain why this deal involved officials at higher levels in the Obama Administration than any other in the Loan Guarantee Program.

A8b. The role of senior DOE officials in the Project Amp transaction was consistent with that of the other transactions completed under the Sec. 1705 program. While not every transaction required senior-level attention to policy matters, those that did were given the appropriate

**attention. As previously mentioned, Project Amp was one of the projects that required senior-level attention to policy matters, given the proposed tenor of the loan's draw period.**

## QUESTION FROM REPRESENTATIVE HALL

The budget repeatedly highlights President Obama's commitment to doubling the budget of key basic research programs at the Office of Science along with that of NIST and NSF. However, the budget request for the Office of Science is proposed to increase by only 2.4 percent. At that rate, it would take almost 30 years to double the budget, and that doesn't even account for inflation that would occur during that time. Meanwhile, DOE's green energy programs, such as EERE and ARPA-E, are proposed to increase by 29 percent and 27 percent, respectively.

**Q9a.** Why is funding for the Office of Science such a low priority relative to other DOE R&D programs?

**A9a.** The \$4.99 billion dollar FY 2013 request for the Office of Science represents a strong commitment by the Administration to maintain our Nation's investments in basic scientific research as part of the ongoing commitment to doubling the combined budget for these three agencies. The FY2013 requests for the Office of Science, EERE, and ARPA-E reflect the Administration's judgment that there is exceptional potential for near-term breakthroughs in clean energy technologies, and the Budget balances these priorities in a manner that is consistent with the Budget Control Act of 2011.

**Q9b.** In testimony before this Committee in 2006 you said "[i]n funding ARPA-E, it is critical that its funding not jeopardize the basic research supported by [DOE's] Office of Science. The [National Academy of Sciences] recommendations are prioritized and its top recommendation in the area of research is to increase the funding for *basic research* by 10 percent per year over the next seven years."

Do you still agree with the NAS panel recommendation that the Office of Science should be the top research priority within DOE, and that ARPA-E funding should not jeopardize Office of Science funding? If so, how do you explain the lack of balance in the President's request?

**A9b.** Since FY 2006, budget requests and appropriations have led to significant growth for the Office of Science from \$3.6 billion to \$5.0 billion (a 39 percent increase), which demonstrates the priority placed on basic research across two Administrations and several Congresses. These sorts of sustained investments in basic research are essential to the Nation's long term prosperity. The Department places a strong emphasis on coordination

of its basic and applied research programs to ensure that new breakthroughs in basic science drive new technologies and that scientific research is informed by the barriers encountered by technology developers. The Department's FY 2013 budget as a whole constitutes a strong commitment to DOE's research programs; it balances opportunities in basic and applied research. ARPA-E's \$350 million budget is 7 percent of the Office of Science budget, and I do not feel ARPA-E is jeopardizing our basic research funding.

## QUESTION FROM REPRESENTATIVE HALL

**Q10. The FY13 budget request proposes \$45 million in new spending for an interagency effort (with EPA and USGS) to study the impacts of hydraulic fracturing. The budget provides very little description of what this funding is intended to be used for.**

- a. Please provide a detailed description of what specific issues DOE intends to examine with the requested funding. Please also describe DOE's plans regarding transparency, peer-review, and stakeholder input associated with the proposed hydraulic fracturing research.**

**A10a. On April 13, 2012 DOE, the Environmental Protection Agency, and the Department of the Interior's U.S. Geological Survey signed a Memorandum of Agreement formalizing a multi-agency collaboration on unconventional oil and gas research. Through this collaboration, a robust Federal F&D plan is being developed, taking into account the recommendations of the Secretary of Energy's Advisory Board (SEAB) Natural Gas Subcommittee. DOE's role in this initiative will focus on priorities identified by the interagency collaboration in a research plan to be formed over the next nine months within its area of core research competencies, including wellbore integrity, flow and control; green technologies; and systems engineering, imaging and materials.**

- b. Please detail, by activity description and funding level, activities in the President's DOE budget request aimed at expanding supply and production of natural gas.**

**A10b. The President's DOE budget request includes \$17 million for Natural Gas Research. This research is aimed at ensuring the safe and environmentally sustainable production of natural gas from shale formations (\$12 million) and conducting work on gas hydrates (\$5 million).**



**QUESTION FROM REPRESENTATIVE HALL**

**Q11. As Secretary of Energy, do you support construction of new coal-fired power plants in the absence of significant carbon controls?**

**A11. The decision to propose new coal-fired power plants is best made by utility companies in response to market conditions that make it favorable to do so. The approval of a project with or without carbon controls is the decision of the regulatory and permitting authorities, and others in the States that have jurisdiction over such projects.**

## QUESTION FROM REPRESENTATIVE HALL

**Q12. DOE's coal research activities are almost exclusively focused on developing carbon capture and sequestration technology, the *goal* of which is to limit the increase in the cost of electricity to 35% above traditional pulverized coal plants. How much specific **non-CCS** R&D is proposed in the Administration's FY 2013 coal R&D budget?**

**a. What is DOE doing to **lower** the cost of coal-fired electricity?**

**A12a.** The cost of coal-fired electricity is ultimately a function of significant market factors. The focus of the Department's coal R&D is on integration of CCUS technologies with different types of power plant configurations (pulverized coal, IGCC, oxy-fuel combustion). However, the Department does conduct research and development (R&D) on advanced clean coal technologies that will bring costs down over time. The Department also conducts demonstration projects that allow first-of-a-kind clean coal technologies to be utilized on a commercial scale. These activities have been shown to reduce costs over the long run, and allow for more efficient, cleaner, and more affordable technologies to be used in the marketplace.

**b. Does DOE's Office of Fossil Energy FY 13 budget request include any coal R&D that will help utilities comply with recent and forthcoming EPA regulations?**

**A12b.** The Office of Fossil Energy (FE) is conducting research on advanced technologies for new plants that will help meet all environmental regulations. However, many of these technologies are specific to gasification-based and oxy-combustion processes and are not applicable to existing coal-fired power plants.

There is no specific funding in the budget related to R&D that will help existing plants comply with recent regulations. The recent EPA regulations, including the Mercury and

Air Toxics Rule (MATS), and the Cross-State Air Pollution Rule (CSAPR), have been designed to include compliance options that are commercially available technologies. Many of these technologies, including Flue Gas Desulphurization, and more recently, Activated Carbon Injection, were funded in the past by FE and developed with communication between EPA and DOE. Forthcoming regulations, focused on cooling water intake structures and coal ash, are also being developed with compliance methods that include commercially available technology. The development and implementation of EPA rules has always been subject to the availability of appropriate technology solutions, and DOE will continue to support this methodology.

## QUESTION FROM REPRESENTATIVE HALL

- Q13.** RWI, a leading scientific and policy research center in Germany, conducted a study of the German push for renewable energy, analyzing the costs and effect on job creation. The report concludes:

**“Although Germany’s promotion of renewable energies is commonly portrayed in the media as setting a ‘shining example in providing a harvest for the world,’ we would instead regard the country’s experience as a cautionary tale of massively expensive environmental and energy policy that is devoid of all economic and environmental benefits.”**

**The report further warns that policymakers, including in the US, should scrutinize Germany’s experience. Your testimony stated America is “at risk of falling behind again [in clean energy investments] unless we make a sustained federal commitment to supporting our domestic clean energy economy.”**

- a.** Is the biggest risk really that we might “fall behind,” or is a greater risk that we fail to learn from the mistakes of countries like Germany regarding renewable energy subsidies, especially with national debt approaching \$16 trillion?

- A13a.** While implementation of Germany’s feed-in tariff program has resulted in a slight increase in electricity prices, it has also led to a decrease in the cost of solar photovoltaic installations, while supporting domestic jobs and increased domestic energy production.

**The economic stakes are high, and the U.S. may risk falling behind our global competitors who are seizing the economic opportunity by investing more heavily and establishing market policies that convey a strategic advantage. One recent energy investment analysis report estimates that the annual global clean energy market is worth \$260 billion, up 32% from 2009, and that it is expected to grow significantly.**

- b.** Has DOE conducted any sort of analysis or scrutiny of the German program or others in Europe? If not, why not? If so, please provide summarize the findings and lessons learned.

A13b. DOE closely tracks the efforts of other countries related to the research, development, and deployment of energy technologies, for possible domestic application. While the German experience with subsidies for solar photovoltaic (PV) technologies offers lessons of interest to U.S. policymakers, it is important to note that U.S. federal mechanisms for renewable energy deployment do not make use of the feed-in tariff (FIT) model that underlies German support for renewable energy deployment. As such, the German experience is not directly comparable to U.S. efforts to promote renewable energy.

Additionally, Germany is a high-latitude country with a sub-optimal solar resource. Despite this constraint, Germany's subsidy program has resulted in higher market penetration and a lower installed cost of solar PV, independent of subsidies<sup>2</sup>, than in the U.S., which has a significantly more favorable resource base. Though German financial support for renewables has resulted in modest increases in electricity prices, it has also resulted in increased domestic jobs in the manufacturing, installation, and maintenance sectors.

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<sup>2</sup> "Tracking the Sun IV: An Historical Summary of the Installed Cost of Photovoltaics in the United States from 1998 to 2010," Lawrence Berkeley National Laboratory, September 2011.

## QUESTION FROM REPRESENTATIVE HALL

- Q14.** The Manhattan Institute recently released a new study titled: "*The High Cost of Renewable Electricity Mandates.*" The study analyzed electricity rates in states with mandates as well as states without mandates. It found "a pattern of starkly higher rates in most states with RPS mandates compared with those without mandates. The gap is particularly striking in coal-dependent states—seven such states with RPS mandates saw their rates soar by an average of 54.2 percent between 2001 and 2010, more than twice the average increase experienced by seven other coal-dependent states without mandates."

The study goes on to say that "Put another way, the higher cost of electricity is essentially a de facto carbon-reduction tax, one that is putting a strain on a struggling economy and is falling most heavily, in the way that regressive taxes do, on the least well-off among residential users."

Still, the Administration is intent on forcing a very similar mandate at a national level. Do you agree with the basic findings of this study—namely that electricity rates will go up if Americans are forced to buy electricity from more expensive sources? If not, why not?

- A14.** The President has not set an energy policy focused on a federal Renewable Portfolio Standard (RPS). Instead, the President has proposed a Clean Energy Standard (CES) to keep our energy supply clean, affordable, and secure. A CES is a flexible, market-based approach with annual targets for electricity from diverse, domestic sources, including renewable energy as well as nuclear power, efficient natural gas, and clean coal. The policy would enable businesses and entrepreneurs to determine the best way to achieve the targets, ensuring that clean energy is produced wherever it makes the most economic sense. By establishing a market for domestic clean energy technologies, this policy would move billions of dollars of capital off of the sidelines and into investments that drive innovation and create jobs. The Administration is confident that a well-designed CES would promote innovation and investment in the clean energy economy while ensuring that all consumers throughout the country, regardless of income, continue to enjoy access to affordable, reliable electricity.

With respect to a renewable portfolio standard, the Energy Information Administration (EIA) has, over the past few years, analyzed several legislative proposals for such policies. Through these analyses, EIA has found that numerous policy details can significantly influence the impact of the policy on key indicators such as the price of electricity, generation mix, cost to consumers, cost to industry, and even achievement of the targeted generation share. These key parameters include the existence and level of any limits on the price of renewable energy credits; exemptions for certain classes of utilities or exclusion of certain generation from requirements of the program; the ability to “bank” early compliance credits; and the existence of “credit multipliers,” “set-aside” targets, and tiered compliance systems that incentivize specific technologies within the suite of eligible technologies. Because of the importance of policy design, it is impossible to characterize the impacts of a federal RPS policy in the abstract.

The cited Manhattan Institute study shows results that are significantly at odds with prior studies on price impacts of State RPS policies. This study suffers from numerous methodological weaknesses, including but not limited to a failure to properly account for factors other than RPS policy that may affect differences in electricity prices among States and over time. In addition, it appears to attribute to RPS policy changes in price that occurred in certain states prior to the existence of any RPS policy and/or any significant RPS targets; failing to identify any plausible mechanism by which an RPS policy could affect prices prior to its introduction into law or prior to any significant generation requirements above baseline renewable generation levels.

**QUESTION FROM REPRESENTATIVE HALL**

**Q15. Has the Obama Administration considered the negative consequences the President's anti-energy policies would have on independent petroleum producing small businesses?**

- a. Has the Department of Energy examined how much additional tax burden would be shouldered by those independent producers under the President's proposals to eliminate tax deductions? If not, will you conduct such an analysis?**

**A15a. The Administration believes that to foster the clean energy economy of the future and reduce the Nation's reliance on fossil fuels that contribute to climate change, it is appropriate to repeal tax provisions that preferentially benefit fossil fuel production. Oil and gas subsidies are costly to the American taxpayer and do little to reduce energy prices. Removing these lower-priority subsidies would reduce greenhouse gas emissions and generate \$38.6 billion of additional revenue over the next 10 years. This \$38.6 billion represents only a small percentage of domestic oil and gas revenues – about one percent over the coming decade. These terminations free up resources to invest in clean energy development and production, which is critical to the Nation's long-term economic growth and competitiveness.**

- b. How would this impact the ability for those companies to hire additional employees and provide abundant and affordable energy? Has DOE considered the impact on total energy production due to higher taxes?**

**A15b. The Administration believes that to foster the clean energy economy of the future and reduce the Nation's reliance on fossil fuels that contribute to climate change, it is appropriate to repeal tax provisions that preferentially benefit fossil fuel production. Oil and gas subsidies are costly to the American taxpayer and do little to reduce energy prices. Removing these lower-priority subsidies would reduce greenhouse gas emissions and**



**generate \$38.6 billion of additional revenue over the next 10 years. This \$38.6 billion represents only a small percentage of domestic oil and gas revenues – about one percent over the coming decade. These terminations free up resources to invest in clean energy development and production, which is critical to the Nation's long-term economic growth and competitiveness.**

## QUESTION FROM CONGRESSMAN HALL

**Q16. The Department is requesting appropriations language for the Energy Efficiency and Renewable Energy account allowing you to transfer “up to \$100,000,000 to the Defense Production Act Fund for activities of the Department of Energy pursuant to the Defense Production Act of 1950.” What additional activities would this transfer authority allow that DOE cannot undertake under existing statutory authority?**

**A16. The authority allows the Department of Energy (DOE) to transfer funds to the Defense Production Act Fund to be dispersed for activities with mutual benefit to the respective missions of DOE's Energy Efficiency and Renewable Energy (EERE) program and the Department of Defense (DoD). This arrangement provides a streamlined approach for both Departments to issue joint solicitations and appropriately fund contracts that will result in first, demonstration of innovative technology, and then second, provide production capacity for products with defense applications. The Defense Production Act provides for strengthening the domestic production of components, technologies, or industrial resources, such as biofuels, that the DoD determines are critical for the execution of the national security strategy of the United States.**

**DOE is seeking the authority to fund vendor demonstration of production capability for innovative biofuels, suitable for use by defense aircraft and ships. As part of a partnership with the Defense Department, DOE would fund work for development and scale-up activities to develop and demonstrate the biomass technology to make these fuels.**

## QUESTION FROM CONGRESSMAN HALL

**Q17. The Office of Energy Efficiency and Renewable Energy (EERE) Advanced Manufacturing Office is requesting \$100 million in new funding to “demonstrate manufacturing processes.”**

- a. Please describe what specific manufacturing process demonstration projects DOE will fund and how applications will be reviewed and selected.**

**A17a. DOE projects funded through the Advanced Manufacturing Office (AMO) are selected through an open and competitive process using criteria tailored to help achieve the key objectives of the program. For example, plans for AMO’s Manufacturing Demonstration Facilities (MDFs) solicitation include asking applicants to propose topic areas that will have broad-reaching and/or transformational impact to reduce energy use, demonstrate the use of materials for energy technologies, create new products and processes, and support the domestic manufacturing base.**

**While DOE has not yet issued a solicitation for the MDFs, the objectives established for this initiative describe an MDF as a collaborative, shared infrastructure focused on manufacturing research, development, and demonstration (RD&D) in different technical focus areas. In addition, MDFs will enhance opportunities for U.S. manufacturers to develop, use, and demonstrate energy efficient, rapid, flexible manufacturing technologies. In operation, the MDFs will provide the manufacturing community, particularly small- to medium-size enterprises, with access to physical and virtual tools as well as expertise for prototyping new technologies and optimizing critical manufacturing processes.**

**Through the Innovative Manufacturing Initiative (IMI), another RD&D program, AMO is currently completing a competitive selection for industry-led cost-shared technology R&D**

and demonstration projects within broadly identified priority technology domains such as Reactions and Separations; High Temperature Processing; Waste Heat Minimization and Recovery; and Sustainable Manufacturing. Also included as possible research domains in this first IMI solicitation are Innovative Materials topic areas potentially including Thermal and Degradation Resistant Materials; Highly-Functional, High-Performance Materials; and Lower Cost Materials for Energy Systems. Industry response to the IMI solicitation was widespread and diverse. AMO received more than 1,400 total Letters of Intent through this solicitation. 78% of responses from industry were from small enterprises (fewer than 500 people). Only a small percentage of these Round One proposals will be funded. Awardees are expected to be announced publicly.

AMO also remains committed to combined heat and power and former Industrial Technologies Program demonstration projects currently in its portfolio so long as these projects continue to meet their technical milestones.

- b. Manufacturers have significant financial incentives to institute energy efficiency improvements that will save them money. Please describe the barriers to implementation that limit private industry from undertaking energy efficiency improvements that will be demonstrated by this program.

A17b. There are a number of barriers that can limit private industry from undertaking energy efficiency technology development and demonstration. Examples of barriers include: 1) taking on increased technical risk without guarantee of return on investment, 2) total cost/size of investment required, and 3) the ability to develop a new technology or process to a meaningful scale under production-pertinent environments.

AMO helps to address those barriers by: 1) providing the manufacturing community access to expertise for prototyping new technologies and optimizing critical manufacturing processes, 2) providing the data necessary to establish the manufacturing viability of innovations, and 3) facilitating the efficient use of capital resources (both public and private) so that one set of physical and virtual tools is made available to many potential innovators. The provision of these benefits is of particular use to small- and medium-sized enterprises that face larger hurdles for access to both physical resources and expertise.

**QUESTION FROM REPRESENTATIVE HALL**

**Q18. Section 1007 of the Energy Policy Act of 2005 (P.L. 109-58) gave the Secretary of Energy the ability to use "other transactions authority," and Section 3118 of the National Defense Authorization Act of 2011 (P.L. 111-383), extended this authority through September 30, 2015.**

**Q18 (a) Which offices of the Department has the Secretary delegated this authority?**

**A18 (a) The authority can only be delegated to a Presidentially appointed Senate confirmed position/person. The Secretary delegated the authority to the Under Secretary of Energy.**

**Q18(b) Provide a list all technology investment agreements (TIAs) DOE has entered into to date, beginning with the first TIA finalized in November 2007 with Range Fuels for funding to design, construct, and operate an integrated biorefinery to produce primary ethanol from lignocellulosic feedstock.**

**Q18(c) For each TIA identified above, please provide the following: amount of DOE funding; amount of cost-sharing; technical objectives; description of the extent to which the TIA contributed to broadening if the technology and industrial base available for meeting DOE's mission needs; and extent to which the TOIA has fostered new relationships an practices.**

**A18(b)&(c). Please refer to included table attached.**

## QUESTION FROM REPRESENTATIVE HALL

**Q19. Advanced materials are frequently identified as a challenge associated with developing the next-generation of nuclear power plants. What advanced materials research and development is DOE proposing in FY13?**

**A19. The Department of Energy (DOE) is proposing to perform advanced materials research and development to characterize and provide the required design bases for new materials that can withstand the harsher environments of advanced reactors for longer periods of operation. This research also aims to develop materials that have better performance in accident scenarios. These materials could be used in small modular reactors and high-temperature gas-cooled reactors, as well as liquid metal- and salt-cooled reactors.**

**Specifically, these efforts will include the assessment of modern graphites, high-temperature structural alloys, and structural composites needed for construction of critical components, such as reactor pressure vessels and piping, core supports and other reactor internals, heat exchangers, fuel cladding, and power conversion equipment. These more radiation-resistant, advanced materials will allow the reactors to operate at higher temperatures and pressures over longer timeframes, thereby increasing the efficiency of electricity production and the safety of the reactor. This research will also develop and validate the bases for improvements in the national codes and standards required for eventual regulatory approval of such materials usage in advanced reactors.**

#### **QUESTION FROM REPRESENTATIVE HALL**

- Q20. The Office of Nuclear Energy's budget for 2013 overall will see a 10 percent reduction from FY12 appropriated funds. One of the changes that mask this reduction is the \$95 million for Idaho Site-Wide Safeguards and Security Program that has been moved into the Office of Nuclear Energy. What was the reason for this proposed move?**
- A20. The request to transfer the Idaho National Laboratory (INL) Safeguards and Security (S&S) program from the Other Defense Activities (ODA) Appropriation to the Nuclear Energy (NE) Appropriation did not impact the overall NE funding request level. It is just a coincidence that the total cost of the transfer was similar to the overall reduction in the NE Appropriation.**

**The Department believes there is merit in transferring the INL S&S program into the NE Appropriation. This transfer is consistent with how the Department requests funds for other S&S programs. The request also aligns all NE programs within one appropriation, which will allow trade-offs among NE programs without impacting non-NE programs within the ODA Appropriation.**



#### QUESTION FROM REPRESENTATIVE HALL

**Q21. Please provide an update on the status of the Next Generation Nuclear Plant (NGNP) and the project's overall outlook and upcoming milestones.**

**A21. The Next Generation Nuclear Plant (NGNP) Demonstration Project continues to concentrate on high temperature reactor research and development (R&D) activities, interactions with the Nuclear Regulatory Commission (NRC) to develop a licensing framework, and activities related to establishment of a public-private partnership as discussed in the Department's letter to Congress on October 17, 2011. Ongoing R&D to support development of high temperature gas-cooled reactors (HTGR) is focused on qualification of TRISO coated particle fuel, qualification of graphite and high temperature materials to be used in HTGR construction, and on computational methods for ensuring the safety and performance of these advanced reactor designs. This year the project expects to complete compacting process qualification testing for the commercial fuel manufacturing. Post-irradiation examination of the first samples of new nuclear grades of graphite tested will be completed by June 30, 2012. Finally, the Department is preparing to release a solicitation to obtain analyses, data, and information on the long term commercial viability of NGNP technology. This contract is expected to be awarded by the end of this fiscal year.**

### **QUESTION FROM REPRESENTATIVE HALL**

- Q22.** During a Committee hearing on the Blue Ribbon Commission's Report to the Secretary of Energy, former NRC Chairman Richard Meserve stated that there are not any barriers to constructing a reprocessing facility in the United States. However, the Nuclear Regulatory Commission currently lacks the regulatory guidelines for such a facility. Please clarify whether or not there is an existing and workable framework at the NRC for licensing and building a reprocessing facility.
- a.** Is DOE supportive of creating a regulatory framework in which a reprocessing facility could be licensed and constructed? If so, how will DOE support moving forward with such a project?
- A22.** Questions about the NRC's regulatory framework for reprocessing should be directed to the NRC. The DOE and the NRC maintain an effective working relationship relative to advanced fuel cycle technology R&D.

## QUESTION FROM REPRESENTATIVE HALL

**Q23.** Abound Solar, a recipient of a \$400 million DOE loan guarantee, has laid off a substantial portion of its workforce and delayed plans to open a new manufacturing facility. Reportedly, Abound Solar has drawn down \$70 million of the total loan guarantee amount. Please provide the current status of the Abound Solar project, including its ability to meet performance milestones included in the contractual terms stipulated by the agreement.

**a.** How does DOE evaluate the performance of the individual loan guarantees and decide whether a recipient is meeting performance expectations?

**A23a.** DOE's LPO teams perform extensive due diligence of each applicant and its business case prior to loan closing, followed by continual monitoring, review and analysis until the loan is repaid in full. This due diligence and review is performed by multi-disciplinary teams of engineers, attorneys, accountants, industry consultants and financial analysts, with additional expertise called upon as required.

In some projects, the due diligence and analysis identifies a number of steps in the development of the business case considered critical to making and keeping the project financially viable, as well as performance indicators that will help DOE loan monitoring teams evaluate whether the approved plan remains on track. In some cases, the key steps are reflected in specific milestones that must be accomplished by a date certain (e.g., unit throughput, process yield, solar cell efficiency level, etc.), while in other cases, DOE staff requires regular reporting of performance information (e.g., EBITDA, quality level, sales per employee, cost per unit) that is indicative of project health.

Finally, DOE loan monitoring staff continually factor this information into project budgets and dynamic financial forecasting models to ascertain whether changes in the

project or business have affected projections of the borrower's ability to repay the loan when due.

Project milestones and financial covenants are typically highly negotiated and tightly specified prior to the closing of the loan. In the case of performance indicators and financial projections, staff analysts and consultants continually assess actual results and new assumptions using projection models to determine whether the approved forecast has materially changed. DOE recognizes and expects that business conditions and business plans will change during a multi-year project. If an analysis indicates that a previously approved business plan is no longer viable, DOE generally requires the borrower to revise the plan to DOE's satisfaction.

- b. Given the circumstances surrounding Abound Solar's performance, is DOE allowing it to draw down on the remaining \$330 million in funding? If so, why?

A23b. As is the case for all projects within DOE's portfolio, Abound's access to DOE funding was predicated on the project continuing to meet required conditions and milestones.

Among the conditions to DOE's approval of additional funding, Abound was required to provide an updated business plan that was acceptable to DOE in its sole discretion. As you are likely aware, Abound filed for bankruptcy on July 2, 2012 and funding disbursements on the loan had been halted in August 2011.

#### **QUESTION FROM REPRESENTATIVE NEUGEBAUER**

**Q1. I understand that the budget is proposing to spend \$170 million in funding left over from prior appropriations to issue new loan guarantees.**

**Q1a. Is that correct, and if so, how many new loan guarantees do you expect to issue, what will the total amount of those loans be, and what is the expected timing of these awards?**

**A1a. As you know, the §1703 loan program was adopted as part of Energy Policy Act of 2005 to provide financing support to advanced technologies on reasonable terms. The 2012 appropriations provided an additional \$170 million in appropriated credit subsidy to support §1703 loan guarantees for innovative renewable energy or efficient end-use energy technologies and brought the balance of guaranteed loan volume authority to \$1.5 billion for projects where the credit subsidy cost is funded by the project sponsor.**

**Authority to enter into new loan guarantees under §1705 loan program sunset September 30, 2011 -- a deadline by which projects had to not only complete due diligence and close on their loans, but also start construction. Faced with a large volume of projects, but a limited number able to meet this mandate, in May 2011 the Department sent letters to more than three dozen project sponsors, informing them that they would not qualify under §1705, but could be considered in the future for loan guarantees under the §1703 program. As the letter noted, this was not a statement of the quality or worthiness of those projects; it was simply a matter of timing.**

**Following the completion of the Independent Consultants Review by Mr. Herb Allison, the Department has developed a process for considering pending applications for the available §1703 funding. On April 5, 2012, the Department commenced this process by sending a letter to project sponsors with pending applications that may qualify for the**

§1703 funding referred to above, asking them if they still wanted to be considered for a loan guarantee.

The exact number of projects and the total dollar value of the loan guarantees in the §1703 renewable energy pipeline will depend on the government's assessment of the risk level of the projects selected and the sponsors willingness to continue to pursue a loan guarantee.

**Q1b.** I also understand that you recently stated you were receiving "mixed signals" from Capitol Hill regarding the future of the loan program. Given the troubled history of this program, why should Congress allow that \$170 million to be risked? Have you or others in the administration at any point considered that perhaps that \$170 million would be better spent if it went to deficit reduction or higher priority research programs?

**A1b.** From solar energy to wind to biofuels and more, the global market for clean energy technologies reached \$260 billion last year and is growing rapidly, according to one recent energy investment report. Recognizing the enormous economic opportunities ahead, countries like China, Germany, and others around the world have established programs to provide government-backed financing for innovative technologies and companies. Such support is crucial because private lenders are often unwilling or unable to absorb the risks associated with financing truly innovative or advanced technology projects at scale until such projects have been proven in the marketplace.

By any measure, the Energy Department's loan programs have helped the United States keep pace in the fierce global race for clean energy technologies. Over the past three years, the loan programs have invested in some of the world's biggest, most innovative, and most ambitious clean energy projects to date, supporting a balanced portfolio of

American clean energy projects that are creating tens of thousands of jobs nationwide and are expected to provide power to nearly three million U.S. households.

In part because of these cutting edge projects and the private sector investment enabled through the loan program, the United States has nearly doubled renewable energy generation since 2008, and last year U.S. solar installations grew by nearly 110 percent.

But given how intense the global competition is – China offered \$30 billion in government-backed financing to solar companies in 2010 alone – we cannot afford to stop moving forward.

Our historic investment in clean energy is paying off, and it will come back to us many times over – in jobs, in clean energy for our communities, and in leadership in the technologies of the 21st century.

## QUESTION FROM REPRESENTATIVE NEUGEBAUER

**Q2. The Administration has indicated openness to yet again tapping the Strategic Petroleum Reserve in an attempt to ease short-term gas prices. However, according to your Department's own reports, the Administration's release of 30 million barrels from the Strategic Petroleum Reserve from last June has yet to be replenished. In fact, while sales of the reserves last June brought in \$3.3 billion, higher prices could now result in us paying \$4 billion to replenish that oil, costing the American taxpayers an additional \$700 million.**

**a. Why has the oil not yet been replenished?**

**A2a. The 2013 Budget reflects plans to repurchase 27 million barrels of oil for the SPR over a five year period beginning in FY 2013 assuming market conditions are favorable.**

**b. What conversations have you had with the White House about tapping the SPR again?**

**A2b. The purpose of the Strategic Petroleum Reserve is to mitigate the impacts of supply interruptions. There have been increasing disruptions in the supply of oil to the global market over the past several months, which pose a substantial risk to global economic growth. In response, major producers have increased their output while drawing prudently on excess capacity. Looking ahead to the likelihood of further disruptions in oil sales and the expected increased demand over the coming months, we are monitoring the situation closely and will work with our partners in the International Energy Agency to take appropriate action to ensure that the market is fully and timely supplied.**

**c. Has the Administration considered the necessity of replenishing current balances in the SPR before hastily releasing more oil, putting us at an even greater risk to legitimate emergencies and severe shortages?**



**A2c. The 2013 Budget reflects plans to repurchase 27 million barrels of oil for the SPR over a five year period beginning in FY 2013 assuming market conditions are favorable. The SPR currently holds 696 million barrels of crude oil, which should be sufficient to mitigate any adverse impacts to the United States from a shortage or interruption of energy supplies or for the United States to meet its obligations under the international energy program. Based on EIA data for 2010, imported oil accounted for less than 50 percent of the oil consumed in the United States for the first time in 13 years.**

- d. Did your Department estimate price projections that would affect the replenishment of SPR supply following the drawdown? What role did that play in the President's decision?**

**A2d. The 2011 SPR drawdown was conducted to meet the obligations of the United States under the international energy program, pursuant to section 161(d) of the Energy Policy and Conservation Act.**

- e. Do you believe that current economic conditions and oil supply represent a true emergency or "severe supply interruption?"**

**A2e. Absent an actual or imminent supply interruption, there are no plans to release crude oil from the SPR. The purpose of the Strategic Petroleum Reserve is to mitigate the impacts of supply interruptions. There have been increasing disruptions in the supply of oil to the global market over the past several months, which pose a substantial risk to global economic growth. In response, major producers have increased their output while drawing prudently on excess capacity. Looking ahead to the likelihood of further disruptions in oil sales and the expected increased demand over the coming months, we are monitoring the**

situation closely and will work with our partners in the International Energy Agency to take appropriate action to ensure that the market is fully and timely supplied.

- f. How might a depleted SPR affect our ability to respond to potential future disruptions in supply?

A2f. The SPR sold approximately 30 million barrels in 2011, only 4 percent of the Reserve's total stocks. The current inventory of 696 million barrels is equivalent to roughly 82 days of US imports and provides adequate protection for any near-term oil situation. .

#### QUESTION FROM REPRESENTATIVE LIPINSKI

**Q1. The proposed reduction to the SMR Licensing Technical Support program is small – just \$2 million – but this program was originally conceived as a 5-year, \$450 million partnership with private companies. With the first two years significantly below the anticipated funding trajectory, I am concerned that these funding shortfalls could turn into significant overall cost increases – something we have seen in other complex engineering projects. Secretary Chu, do you anticipate being able to meet the expectations of SMR industry partners, and how are we coordinating with them to make sure the program stays on track?**

**A1. In the FY12 appropriation, DOE received \$67 million for the SMR Licensing Technical Support program and believes the program is on track. A Funding Opportunity Announcement will be released soon for the program and the Department will start executing the complex solicitation review process to establish the joint projects with industry.**

#### QUESTION FROM REPRESENTATIVE LIPINSKI

- Q2.** The cuts to the SMR Advance Concepts R&D program are even more substantial – over 30 percent. Secretary Chu, what impact will this cut have on research programs, especially at our national labs, and on the Department’s goal of deploying innovative technologies in 15-20 years?
- A2.** The impact of the reduced budget will be negligible on the long term scope and pace of progress for R&D supporting advanced SMR concepts that could be deployed in the next 15-20 years. The program conducts R&D in the areas of materials, safety and licensing issues, components and technology development and energy conversion, and is applicable to multiple technology options.

## QUESTION FROM REPRESENTATIVE LIPINSKI

Q3. Secretary Chu, I am concerned that the proposed budget cuts are leading to squandered opportunities with hydrogen fuel cells, including the H-Prize program. I realize that, by their nature, prize challenges won't always be met. However, I am concerned by the fact that the DOE did not appear to put as much effort in the H-Prize program as it did into the L-Prize program. Can you contrast these two programs, tell me what you learned from the failure of the first H-prize, and tell me why the \$1 M H-Prize purse wasn't re-used for a second competition?

A3. The Department values prize challenges including the H-Prize to help incentivize innovation and complement existing funding. In fact, significant efforts were made with the first H-Prize, including a competitive solicitation to select an administration entity and a competition to address one of the key challenges – hydrogen storage. Through stakeholder input, specific technical criteria were set, and an independent test facility was selected to perform the review and assessment of Prize finalists. One of the key lessons learned was the importance of designing a topic that is both innovative and achievable in a reasonable timeframe while generating broad interest across the research community. Before issuing another H-Prize competition, the Department is soliciting feedback from stakeholders through a request for information (RFI). The RFI was released on March 19, 2012 for a second H-Prize competition.

<https://www.fedconnect.net/FedConnect/?doc=DE-FOA-0000680&agency=DOE>,

The input from the RFI will be used to design the challenge topic and will allow a suitable and effective H-Prize challenge to be conducted in FY 2012 as planned. The funds remaining from the original \$1 million H-Prize (funded from FY 2008 and FY 2009 appropriations) will be used for this new competition.

## **QUESTION FROM REPRESENTATIVE LUJAN**

**In the Energy Policy Act of 2005 a Technology Commercialization Fund was created within the Dept. of Energy to promote promising energy technologies for commercial purposes.**

**Q1 (a): What is the status of this fund?**

**A1 (a): The Department is making the improvement of its innovation and commercialization ecosystem a top priority, and Technology Commercialization Fund (TCF) is part of the overall plan. The objective is to increase the number of technologies commercialized. This goal is consistent with Section 1001 of the Energy Policy Act (EPACT) of 2005 which requires that 0.9 percent of the annual amount made available for applied energy research, development, demonstration, and commercial application be used towards technology transfer and commercialization activities.**

**Q1 (b): Which offices are contributing their 0.9%?**

**A1 (b): Offices maintaining a technology commercialization fund are Energy Efficiency and Renewable Energy, Fossil Energy R&D, and Nuclear Energy.**

**Q1 (c): How is the fund is being managed and by whom?**

**A1 (c): Consistent with the Act, the Technology Transfer Coordinator works collaboratively with each program to assist with planning and discuss execution of technology transfer and commercialization activities that fulfill Congressional and Departmental objectives. Starting in FY 2012, the Coordinator will also work with the programs to develop consistent goals, strategies, and performance criteria to provide accountability for technology transfer and commercialization results. At the end of each fiscal year, the Coordinator collaborates with all applicable programs and DOE**

offices in order to complete the required annual report to Congress on progress in meeting the goals set forth in the technology transfer execution plan.

**Q1 (d):** How the funds are being utilized?

**A1 (d):** The Coordinator will propose improvements to existing activities, synergies with other Departmental initiatives, and new opportunities. Participating programs will maintain their focus on their technological priorities while benefiting from the Coordinator and inter-agency expertise..

## QUESTION FROM REPRESENTATIVE McNERNEY

Some members of the fusion community have concerns about cuts to domestic fusion research programs in favor of increased support for international programs.

**Q1 (a):** How will funding cuts affect students at the Massachusetts Institute of Technology and other facilities working on fusion?

**A1 (a):** At MIT, there are 29 graduate students currently involved in research on the Alcator C-Mod tokamak. Under the proposed budget, it is expected that up to 13 of these students will be able to complete their research using data from experiments conducted during FY 2012 and receive their Ph.D. degrees in 2013. An additional 5 students might be able to complete their research if additional running time on C-Mod is possible at the end of FY 2012 or in early FY 2013 within the Congressional Request. The remaining 11 students will not be able to complete their current research projects. Where appropriate, the Office of Fusion Energy Sciences will work with MIT to find research homes for those students who can best benefit from bridging their current research to other facilities.

Regarding the total impact within the program, we note that in FY2012 325 full time equivalent students (well over 400 individuals) are supported through the Office of Science to conduct research in the fusion and plasma sciences. The 29 full time MIT students represent a little less than 10% of that total student population. Overall, compared to FY 2012, we estimate there will be a reduction of about 62 full time equivalent students engaged in Office of Science supported fusion and plasma science.



**Q1 (b):** How will our long-term understanding of fusion science be affected by a decrease in research funding?

**A1 (b):** Although the proposed budget will present challenges, it will allow the United States (U.S.) to continue to have an impactful fusion program. The proposed budget will enable a U.S. program that makes significant contributions to resolving vital issues in fusion research thereby building the scientific foundation needed to develop a fusion energy source. It positions the program to obtain a high level of scientific return of our investment in ITER; address gaps in materials science required for harnessing fusion energy; continue to steward the broader plasma sciences, taking advantage of cross-agency synergies; and provide opportunities for U.S. scientists to do research on billion-dollar-class, new international superconducting facilities where technology investments will enable access to a new class of scientific questions not available within the U.S..

**Q1 (c):** How could cuts affect the ongoing research at Lawrence Livermore National Laboratory?

**A1 (c):** Total Fusion Energy Sciences funding to LLNL in FY 2012, spread over a number of research projects, amounted to \$11,129,000. In the FY 2013 Budget Request, LLNL funding for materials research and for NSTX collaborations are not affected. Research collaborations between LLNL and DIII-D will be reduced by 9.6%, and theory and computation research at LLNL by 14%. LLNL funding in the areas of diagnostics, high energy density laboratory plasmas, and laboratory general plasma science are scheduled for review in competitive solicitations in FY 2013.

## QUESTION FROM REPRESENTATIVE McNERNEY

**Q2. The Department's budget for wind energy technologies includes important objectives to increase "the number of certified small wind systems and reduce the cost of energy of small and midsize wind turbines used in community and distributed electricity systems to compete with the retail electricity rates." These distributed wind turbines contribute to the President's clean energy goals.**

**a. How does the Department plan to meet these objectives for small and distributed wind turbines?**

**A2a. While wind technology used in community and distributed applications remains a priority for DOE, the Department has recently increased its emphasis on less mature wind technologies used in offshore applications, as indicated by FY 2012 plans and the FY 2013 budget request. DOE does, however, plan to continue to support activities related to achieving its goal for small wind technology, which is to increase the number of small wind turbine models certified to performance and safety standards from a 2010 baseline of zero to 40 by 2020. The FY 2012 milestone associated with this goal is to certify five models. Planned activities towards meeting this goal are standards development and completing the establishment of the Small Wind Certification Council and four regional small wind turbine testing centers. Product certification is essential for providing consumers, policy makers, and lenders with transparent, third-party-verified small wind turbine performance and safety information. State renewable energy programs are establishing lists of 'qualified' small wind turbines for incentive programs based on the process for certification developed with support from DOE.**

The Department is also currently supporting research, analysis, and modeling to establish near-term cost of energy targets for midsize turbine technology and utility scale technology used in distributed applications, with the goal of being competitive with national average retail electricity rates. Work activities related to achieving this goal include economic analysis, next generation midsize turbine R&D, standards development, and technology transfer support.

## QUESTION FROM REPRESENTATIVE MILLER

**Q1.** ARPA-E has been described as covering unique “white spaces” in energy science and technology that neither industry nor other government programs are willing to fully undertake alone, and then accelerating advances to the marketplace as quickly as possible. In fact, this is what it was instructed to do by the COMPETES Act. Yet, there is some disagreement and confusion about how ARPA-E overlaps with, or builds upon, previous private or government efforts, and how it attracts follow-on funding. Some contend that any overlap is inappropriate as it “crowds out” private investment or duplicates other government programs, and that efforts to attract follow-on investment are similarly inappropriate. Yet, it would be difficult, and possibly unwise, for ARPA-E to limit its activities to funding only those ideas that have not had any other public or private interest, especially given the potential value of later-stage research that is necessarily built upon previous work. Furthermore, many important scientific breakthroughs and technological advances might be overlooked if ARPA-E and its performers are not proactive in promoting and demonstrating them to potential investors, technology developers and customers. Again, these concerns are specifically addressed in COMPETES.

**Q1a.** Does ARPA-E duplicate the efforts of other government programs or “crowd out” private investment? How are these “white spaces” identified?

**A1a.** ARPA-E coordinates and leverages each of its programs and ensures that ARPA-E provides unique value within the rest of DOE. For instance, to improve coordination within DOE, ARPA-E has formed a Panel of Senior Technical Advisors (PASTA). PASTA consists of Assistant Secretaries (or their Technical Appointees) of all the relevant applied energy offices as well as the heads of all the relevant offices in the Office of Science. In addition, the Director of ARPA-E actively coordinates with the Director of the Office of Science, offices and programs falling under the purview of the Office of the Under Secretary for Energy, as well as the Under Secretary for Science. The Department has now formed Integrated Technology Teams along techno-industrial lines (i.e. solar; storage; biofuels; carbon capture, utilization & storage; grid) that span the Office of Science, Applied Energy Offices and ARPA-E. These teams ensure that each of

these offices play unique roles, while ensuring that the work is coordinated and the whole is bigger than the sum of its parts.

Before announcing a new program, ARPA-E undertakes a comprehensive process to identify a technology “white space” that is not likely being addressed by the private sector or other Federal Agencies. ARPA-E technical staff begin by reviewing the scientific literature to identify potential program areas. Next, ARPA-E technical staff examine the current state of the art, the main players in this space, and the major technology challenges. If ARPA-E concludes that a technology white space exists, ARPA-E technical staff organize a workshop, bringing in relevant players from industry, academia, and government to further refine the concept for a potential program. If the workshop is successful, ARPA-E may issue a funding solicitation containing market-based cost and performance metrics that, if achieved, could displace the prevailing technology.

Applicants are required to disclose in their applications whether they submitted the same or similar concepts to ARPA-E, other Federal agencies, or private investors. In addition, applicants are required to disclose prior and current sources of funding for the proposed research project and related work. Finally, applicants are required to provide a detailed explanation for lack of support from existing sources of funding. For example, large businesses are required to explain why the proposed project is not being sponsored internally.

During the merit review process, ARPA-E utilizes expert reviewers from industry, academia, and government to rate and provide comments on applications. These

reviewers help ARPA-E to avoid any with projects funded by other Federal agencies and private investors.

Upon the execution of the funding agreement, ARPA-E invites industry representatives to participate in its meetings with recipients. These meetings enable a free exchange of ideas and encourage collaboration with potential commercialization partners.

ARPA-E recipients are required to disclose in their quarterly performance reports any new funding received from public or private sources. This ensures transparency and enables ARPA-E to make appropriate funding determinations.

**Q1b.** To be safe, should ARPA-E fund only concepts and performers that have not had any previous private sector or government investment, and therefore forego sponsoring potentially important research just because the concept or performer have had some form of previous investment at some stage of development? How does ARPA-E ensure that it is not merely funding what the private sector would otherwise do on its own?

**A1b.** ARPA-E supports its statutory mission to accelerate “transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty.” ARPA-E is careful to not fund any specific and discrete technical idea that had previously received money from industry. To be clear though, some ARPA-E performers have received funding from public or private sector sources for research projects that are distinctly different from their ARPA-E project. ARPA-E sets market-based cost and performance metrics in technology areas that if met could displace the prevailing technology. ARPA-E is technology agnostic and selects among competing new technologies based upon their potential to meet our cost and performance metrics. ARPA-E seeks to create competition between performers.

Applicants are required to disclose in their applications whether they submitted the same or similar concepts to ARPA-E, other Federal agencies, or private investors. In addition, applicants are required to disclose prior and current sources of funding for the proposed research project and related work. Finally, applicants are required to provide a detailed explanation for lack of support from existing sources of funding. For example, large businesses are required to explain why the proposed project is not being sponsored internally.

**Q1c. Should ARPA-E encourage or discourage follow-on investment in the successful projects it sponsors, or should it be passive in that regard and hope that interested investors or customers notice?**

**A1c. ARPA-E is always pleased when research projects it has funded succeed in securing follow-on funding and eventual success in the commercial marketplace. However, ARPA-E believes this is a result of the technical progress made by the recipient. ARPA-E provides aggressive market-based cost and performance metrics, dependable project funding, active program management, and technology-to-market assistance, such as the Technology Showcase at the annual ARPA-E Energy Innovation Summit.**

However, ARPA-E does not pick winners; rather, ARPA-E creates the competition. It funds multiple competitive and parallel approaches to reach the same performance and cost target of technology with very aggressive technical milestones and deliverables. After the technology is de-risked, ARPA-E then lets the private sector pick the ones that are best for business. A successful project is one that meets the technical milestones and deliverables over the course of the award period. ARPA-E sets the bar high and builds

into funding agreements milestones and deliverables that, if met, would not only overcome a specific technical barrier but also bring a technology closer to market deployment. We believe this makes the technology more attractive for future private investment.



## **QUESTION FROM REPRESENTATIVE MILLER**

- Q2. Please comment on the need for coordinated federal activity in the area of critical materials. Would legislation to support inter-agency cooperation help align and leverage the important work taking place at DOE and other agencies?**
- A2. DOE shares your interest in coordination across the federal government. Federal activity in critical materials is coordinated through the White House Office of Science and Technology Policy (OSTP). OSTP convenes a critical and strategic mineral supply chains workgroup with subgroups that focus on critical materials prioritization, R&D prioritization, and information availability and transparency. Each of these subgroups is building on relevant work across the government. For example representatives from DOE and DOD co-chair the group on critical materials prioritization. Thus, the prioritization methods being developed build on the assessment work done by both DOE and DOD. A representative from DOE chairs the R&D prioritization group. This group is crafting a cohesive R&D roadmap drawing on input from representatives from many agencies.**
- Q2a. What is in the FY2013 budget to address the country's critical material concerns? What type of federal support is necessary to support the development of a domestic critical materials industry?**
- A2a. DOE's role in supporting a domestic critical materials industry is primarily to support innovative research, development and demonstration (RD&D) of new technologies and processes. Supporting this research, particularly in a university setting, also can lead to the development of human capital. The FY2013 budget includes the second year of funding for the Critical Materials Hub, managed by the Energy Efficiency**

and Renewable Energy's (EERE) Advanced Manufacturing Office. The hub's FY2012 funding is \$20 million.

In addition, there are a number of other DOE research programs that incorporate critical materials research into their ongoing work. For example, the Materials Discovery, Design and Synthesis research supported by the Office of Basic Energy Sciences within the Office of Science builds the fundamental knowledge that is the basis for material substitutes and new manufacturing process development. Ongoing work by EERE's Vehicle Technologies and Wind Technologies Programs more directly support the development of substitutes for magnets, motors and generators. With FY2012 funding, ARPA-E initiated a new program called Rare Earth Alternatives in Critical Technologies (REACT) that seeks to fund early-stage technology alternatives that reduce or eliminate the dependence on rare earth materials by developing substitutes for electric vehicle motors and wind generators. In addition, ARPA-E's 2012 Open Funding Opportunity Announcement has critical materials as one of its subtopics of interest.

**Q2b.** While policy signals are essential, given the strategic interest in developing domestic capabilities, should the federal government also help support the financing of critical materials production facilities?

**A2b.** The Administration has moved forward on a number of general policies to support manufacturing in the past year, which can also support the domestic critical materials processing. For example, the Advanced Manufacturing Partnership (AMP) was recently established in response to recommendations by the President's Council of Advisors on Science and Technology. AMP is helping create a coherent national innovation policy for manufacturing. The AMP Steering Committee has developed a set of recommendations around three pillars: enabling innovation, securing the talent pipeline and improving the

business climate. This framework is also applicable to critical materials processing. In addition, the President's Framework for Business Tax Reform was issued jointly by the White House and the Department of the Treasury in February 2012. This Framework emphasizes the importance of strengthening manufacturing and innovation, stating "as we expand manufacturing in the United States, the tax code should encourage doing so in way that is sustainable and that puts the United States in the lead in manufacturing the clean energy technologies of the future." In many cases critical materials processing is an early stage of the supply chain for clean energy manufacturing, which could benefit from the support via the aforementioned activities conducted by the Federal government.

A2c. Many existing DOE programs do not reach far enough back in the supply chain to provide support for critical materials development and processing. For example, while lithium production is essential to electric vehicle battery production, lithium development and processing activities are not supported by the Department's vehicles or batteries programs. Is it appropriate for DOE program offices to support the development of a full supply chain, encompassing critical materials?

A2c. Materials processing and separations are among the priority research topics identified in the R&D plan in DOE's 2011 Critical Materials Strategy. Specifically, improving separation and processing of critical materials will support the diversification of the global supply chains. There are a number of R&D challenges that exist in the area. Many traditional separation processes are inefficient and environmentally unfriendly. These processes require the use of harsh solvents and reagents, have long processing times and are very capital intensive. Improving these processes or developing new, more efficient methods would cut costs, reduce energy use, and improve environmental performance across the full supply chain. The Office of Science supports some fundamental work that

**informs the development of new processes. In addition, these research topics are of interest to DOE's SBIR as well as the upcoming Critical Materials Innovation Hub.**

### Technology Investment Agreements

Effective Date	Title	Awardee	DOE Funding	Cost Share	Technical Objectives	Contribution to Technology and Industrial Base for DOE mission	Fostering New Partnerships
10/1/2007	Design, Construction, Building, and Operation of an Integrated Biorefinery	Range Fuels Sopoton Plant, LLC	\$76M	\$280M	To help facilitate the design, construction, and operation of a commercial scale biorefinery for production of ethanol and other products from a minimum of 700 dry metric tonnes per day of lignocellulosic feedstocks	A commercial entity will participate with DOE in a design-build of a first-of-its-kind facility, helping to commercialize a new biofuels process and technology by validating the design and operation at scale	By undertaking cost-shared development and deployment activity, the project could serve as model for future private-sector investments in biofuels, bioproducts, and energy production.
10/1/2008	Design, Construction, Building, and Operation of an Integrated Biorefinery	POET Project Liberty, LLC	\$76.2M	\$117.6M	To provide funding for final design, construction, requirement, start-up, commissioning, and operation reporting of plant capable of producing 700 Dry Metric Tonnes per day of lignocellulose feedstock	A commercial entity will participate with DOE in a design-build of a first-of-its-kind facility, helping to commercialize a new biofuels process and technology by validating the design and operation at scale	By undertaking cost-shared development and deployment activity, the project could serve as model for future private-sector investments in biofuels, bioproducts, and energy production.
1/15/2010	Low-Contract Drilling Technology to Enable Economic Engineered Geothermal Systems (EGS) Wells	Foro Energy, Incorporated	\$9.1M	\$9.1M	To develop a new hybrid thermal/mechanical drilling technology for much faster drilling with less wear and tear on a drill bit	Foro Energy will develop potentially transformational drilling technology that lowers drilling costs for geothermal wells by increasing drill rates up to 10-fold relative to conventional technology	Arrangement allows non-Federal participant in technology development that would not otherwise have participated and encourages future private-sector investment and deployment
2/22/2010	Breakthrough High Efficiency Shrouded Wind Turbine	FloDesign Wind Turbine Corporation	\$8.1M	\$8.1M	To develop a new high efficiency shrouded wind turbine able to deliver significantly more energy per unit of swept area	FloDesign Wind's Mixer Ejector Wind Turbine has the potential to be the next generation wind turbine by providing significantly lower first and life costs compared to traditional horizontal axis wind turbines	Arrangement allows non-Federal participant in technology development that would not otherwise have participated and encourages future private-sector investment and deployment
2/24/2010	Macroalgae Butanol	E. I. Dupont De Nemours and Company	\$8.9M	\$8.9M	To develop a commercially viable process for fermentative production of isobutanol from macroalgae	DuPont will develop a commercially viable process for isobutanol production from macroalgae offering potentially significant advantages over fossil fuels and ethanol currently made from corn, sugarcane, and second generation cellulosic biomass.	Arrangement allows non-Federal participant in technology development that would not otherwise have participated and encourages future private-sector investment and deployment
9/29/2011	U.S. Photovoltaic Manufacturing Initiative (PVMC)—Enabling America's Solar Revolution	The Research Foundation on behalf of the College of Nanoscale Science and Engineering at SUNY Albany and others	\$62.5M	\$180.4M	To establish the U.S. Photovoltaic Manufacturing Consortium, which will coordinate a multi-faceted industry-driven collaborative Research and Development (R&D) initiative	Through its potential consortium members and business experience in the semiconductor industry, PVMC seeks to stimulate U.S. PV manufacturing industry growth, accelerate commercialization of next generation PV technologies, and increase significantly the U.S. share of global PV market.	The project allows the creation of new relationships/partnerships among participants at the prime and sub-tier levels that will result in better PV manufacturing technology and enhance the competitiveness of the U.S. PV manufacturing industry

**Department of Energy**

Washington, DC 20585

August 30, 2012

The Honorable Ed Whitfield  
Chairman, Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U.S. House of Representatives  
Washington, D.C. 20515

Dear Congressman Whitfield:

Thank you for the opportunity to appear before the Subcommittee on July 17, 2012. The questions for the record received on August 10, 2012 from Rep. Pete Olson address policy matters. As the statistical and analytical agency within the U.S. Department of Energy (DOE), the Energy Information Administration does not offer views on merits of policy proposals. However, as the question was also sent to another DOE witness at the hearing, the Subcommittee can expect a response from elsewhere within the Department.

Sincerely,

A handwritten signature in black ink, appearing to read "Howard K. Gruenspecht".

Howard K. Gruenspecht  
Deputy Administrator  
U.S. Energy Information Administration

Enclosure

cc: The Honorable Bobby L. Rush  
Ranking Member



**The Honorable Pete Olson**

1. Given the abundance of viable fuel sources, has any consideration been given to moving away from the gallon mandate and moving toward an emission reduction level that would be at least equal and maybe even exceed that achieved if ethanol was the only fuel, but at the same time help reduce dependence on imported oil?
  - a. If no consideration has been given, do you think there is merit to do so?
  - b. If government's role is not to pick winners or losers, but to reach the 36 billion gallon mandate, shouldn't we also consider other fuels that are abundant - especially if these fuels, such as the conversion of natural gas into CNG/LNG, are as efficient and will reduce emissions as much as ethanol?

FRED UPTON, MICHIGAN  
CHAIRMAN

HENRY A. WAXMAN, CALIFORNIA  
RANKING MEMBER

ONE HUNDRED TWELFTH CONGRESS  
**Congress of the United States**  
**House of Representatives**  
COMMITTEE ON ENERGY AND COMMERCE  
2125 RAYBURN HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515-6115

Majority (202) 225-2927  
Minority (202) 225-3641

August 10, 2012

Dr. Howard K. Gruenspecht  
Deputy Administrator  
U.S. Energy Information Administration  
1000 Independence Avenue, S.W.  
Washington, D.C. 20585

Dear Dr. Gruenspecht:

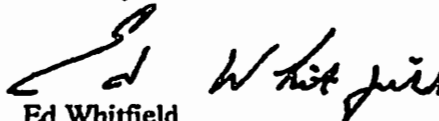
Thank you for appearing before the Subcommittee on Energy and Power on Tuesday, July 17, 2012, to testify at the hearing entitled "The American Energy Initiative." This day of the hearing focused on Federal government perspectives regarding alternative fuels and vehicles.

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for 10 business days to permit Members to submit additional questions to witnesses, which are attached. The format of your responses to these questions should be as follows: (1) the name of the Member whose question you are addressing, (2) the complete text of the question you are addressing in bold, and then (3) your answer to that question in plain text.

To facilitate the printing of the hearing record, please email your responses, in Word or PDF format, to [Allison.Busbee@mail.house.gov](mailto:Allison.Busbee@mail.house.gov) by the close of business on Friday, August 24, 2012.

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,



Ed Whitfield  
Chairman

Subcommittee on Energy and Power

cc: Bobby L. Rush Ranking Member, Subcommittee on Energy and Power

Attachment





**Department of Energy**  
Washington, DC 20585

September 11, 2012

The Honorable Ed Whitfield  
Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On March 8, 2012, Secretary Steven Chu testified regarding "The FY 2013 DOE Budget".

Enclosed are the answers to 40 questions that Representatives Shimkus, Barton, Dingell, Walden, Terry, Capps, Burgess, Rodgers, Bilbray, Murphy, and you submitted to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeff Lane", is written over a horizontal line.

Jeff Lane  
Assistant Secretary for Congressional  
and Intergovernmental Affairs

Enclosures

cc: The Honorable Bobby L. Rush, Ranking Member



**QUESTION FROM REPRESENTATIVE WHITFIELD**

**Q1a. What is DOE's role, if any, in opening up more onshore or offshore production?**

**If DOE has a role, is the Administration considering opening up more onshore or offshore production in the U.S. to lower gas prices?**

**A1a. DOE has no statutory or regulatory role in opening up more onshore or offshore oil and gas production. DOE works with other Federal agencies, e.g., the Department of the Interior, in support of their management and oversight responsibilities for development of offshore and onshore petroleum resources.**

**Q1b. If yes, please describe what areas and when would decisions be made?**

**A1b. DOE has no statutory or regulatory role in opening up more onshore or offshore oil and gas production. Please refer to A1a.**

## QUESTION FROM REPRESENTATIVE WHITFIELD

**Q2. In 2009, you testified before this Committee in support of cap-and-trade legislation and specifically in support of a “low carbon fuel standard.” Do you still support a low carbon fuel standard similar to that proposed in the cap-and-trade legislation advanced last Congress?**

**A2. A variety of policies have been advanced by this Administration to reduce U.S. petroleum dependency and the greenhouse gas intensity of the transportation sector. On the demand side, these include the first-ever fuel economy standards for heavy-duty vehicles, spanning model years 2014-2018, which were issued in September 2011, and new standards for light-duty vehicles for model years 2012-2016, which were issued in May 2010. On the supply side, continued implementation of the national renewable fuels standard (RFS) produced about 14 billion gallons of renewable fuels last year, or about 8 percent of total U.S. highway vehicle fuel. These actions, in turn, have supported a growing domestic renewable fuels industry. A number of other policy options, including a low carbon fuel standard, could be considered to reduce petroleum dependency and the overall carbon intensity of this sector, and the Administration would be pleased to discuss such issues with members of this Committee.**

**QUESTION FROM REPRESENTATIVE WHITFIELD**

**Q3a. The Environmental Protection Agency has been moving forward with new regulations under the Clean Air Act and other environmental statutes affecting power plants.**

**Have you been consulted by Administrator Jackson about any of those rules?**

**A3a. EPA and DOE consult on EPA regulations affecting power plants. DOE also participates in the interagency review of significant EPA regulations that affect power plants. These reviews are managed by the Office of Management and Budget (OMB).**

**Q3b. If so, when and which rules were you consulted about? In your response, please state for each rule when you were consulted.**

**A3b. The Final Cross-State Air Pollution Rule (CSAPR): The interagency review for CSAPR, also known as the Transport Rule, was held during the months of May and June 2011.**

**The Final Mercury and Air Toxics Standards (MATS) for Power Plants: The interagency review for MATS, was held from November 2011 through January 2012.**

**The Proposed New Source Performance Standards for Greenhouse Gas Emissions (GHG NSPS) for Electric Generating Units: The interagency review of GHG NSPS was held during November 2011 and again in March 2012.**

**The Reconsideration of the Final National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers and Process Heaters: This rule is relevant to the power industry, since certain environmental controls**

required under this rule and the compliance times are similar to those required by the regulations affecting power plants. The interagency review of this NESHAP rule was held during October through December 2011.

**Section 316(b) of the Clean Water Act:** The review for this section of the CWA, which details design and construction standards for cooling water intake structures, occurred in February - March 2011.

**The Proposed Regulation for Coal Combustion Byproducts:** The interagency review occurred in July 2010. This rule set forth two options for the regulation of coal combustion residue in the wake of the TVA Kingston coal ash spill.

## QUESTION FROM REPRESENTATIVE WHITFIELD

- Q4a.** For FY 2013, DOE proposes *reducing* the funding for development of carbon capture and storage or “CCS” technology.

Under DOE’s current planning, what is a realistic date by which CCS could be developed and deployed on a large commercial scale?

- A4a.** The Coal Research, Development, and Demonstration Program (Coal Program) involves maturing technologies that both improve base plant efficiency and reduce the cost and energy penalty associated with capturing, utilizing and storing CO<sub>2</sub>. The Program’s goal is to enable commercial baseload carbon capture, utilization, and storage deployment by 2020.

- Q4b.** In your view, is CCS a workable option on a large commercial scale in the near term?

- A4b.** The Coal Program funds research, development, and demonstration efforts on advanced carbon capture, utilization, and storage (CCUS) technologies required to overcome the technical and economic barriers to making CCUS a workable option for widespread, cost-effective baseload deployment by 2020. The FY 2013 funding request prioritizes research on key near-term CCUS technologies to reduce cost, reduce the energy penalty associated with carbon capture, improve power plant efficiency, and validate safe, permanent storage of CO<sub>2</sub>, with the goal of demonstrating these technologies in the 2016 timeframe.

**QUESTION FROM REPRESENTATIVE WHITFIELD**

**Q5. DOE budget documents state that under DOE's "innovative Technology Loan Guarantee Program" the agency has committed almost \$27 billion to support over 30 clean energy projects. DOE says these loan guarantees will create "22,000 permanent and construction jobs." What is the breakdown between permanent versus construction jobs? Can you provide the Committee an estimate?**

**A5. As of April 10, 2012, the Department expects the Title XVII projects to support 20,901 permanent and construction jobs. They represent estimates provided by the company and are subject to change when the project is underway. The breakout of these jobs by project is as follows:**

<b>Project</b>	<b>Construction Jobs</b>	<b>Permanent Jobs</b>
Georgia Power	3,500	800
Areva	1,000	310
Solyndra Inc.	3,000	N/A
Beacon Power Corporation	20	14
BrightSource Energy, Inc.	1,000	86
Kahuku Wind Power, LLC. (First Wind)	200	10
US Geothermal, Inc.	150	10
Nevada Geothermal Power Company, Inc. (Blue Mountain)	200	14
Abound Solar	400	0
Abengoa Solana	1,700	60
Caithness Shepherds Flat	400	35
Agua Caliente	400	10
LS Power Associates (ON Line) (SWIP)	400	15
SoloPower, Inc.	270	450
Record Hill Wind	200	8
California Valley Solar Ranch	350	15
Cogentrix Alamosa Solar	75	10
Solar Reserve Tonopah (Crescent Dunes)	600	45
Ormat (Nevada)	332	64
Abengoa Mojave	830	70
Genesis	800	47
Sempra Mesquite	300	7
1366	50	70
Granite Reliable	198	6
Amp/Photon	1,028	42
First Solar, Inc. (Antelope)	350	20
First Solar, Inc. (Desert Sunlight)	550	15
Abengoa Bioenergy Biomass of Kansas	300	65
<b>XVII Totals</b>	<b>18,603</b>	<b>2,298</b>



## QUESTION FROM REPRESENTATIVE WHITFIELD

- Q6. Why does DOE believe that its appliance efficiency standards process is the appropriate way to advance energy efficiency for highly innovative, rapidly changing products such as consumer electronics and IT equipment?
- A6. Consumer electronics and IT equipment are increasingly becoming significant portions of national energy use. According to the U.S. Energy Information Administration, in 1978, appliances and electronics accounted for 17% (1.77 quads) of total energy use in U.S. homes compared to 31% (3.25 quads) in 2005. As of 2009, 76% of U.S. homes had at least one computer, 45% have at least one television with a screen size 37 inches or larger, 79% have a DVD player, and 43% have at least four electronic devices, such as cell phones, at home.<sup>1</sup> DOE supports a range of approaches to increasing energy efficiency for these products.

DOE recognizes that appliance standards are not the only way to advance energy efficiency for these products and supports efforts through other programs, such as ENERGY STAR. Over the past year, DOE has worked with the Environmental Protection Agency (EPA) to develop robust test methods for computers, servers, small network equipment, imaging equipment, game consoles, and displays. However, DOE notes that ENERGY STAR is a voluntary program and, as such, manufacturer involvement is not required. In 2010, for example, 53% of desktop computers, 57% of LCD monitors, and 48% of set-top boxes were not ENERGY STAR qualified.<sup>2</sup> This means less efficient products still exist in the marketplace and consequently, there are opportunities for additional energy savings.

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<sup>1</sup> "Share of energy used by appliances and consumer electronics increases in U.S. homes", <http://www.eia.gov/consumption/residential/reports/electronics.cfm>

<sup>2</sup> ENERGY STAR® Unit Shipment and Market Penetration Report Calendar Year 2010 Summary

In order to respond to these types of rapidly changing products, DOE is investigating ways to be more flexible in its rulemaking analysis. The goal is to: 1) speed up the analytical process to adapt to changes in the marketplace, 2) encourage development of consensus standards recommendations among stakeholders for DOE's consideration under the Energy and Policy Conservation Act (EPCA), and 3) create an energy conservation standard(s) that is flexible enough for product innovation. DOE will be pursuing these goals in its current set-top box efficiency standards rulemaking.

## QUESTION FROM REPRESENTATIVE WHITFIELD

- Q7. Why is DOE spending significant resources in a current rulemaking to develop a standard for measuring TV power consumption when the private sector is already well underway in developing such a standard with input from industry, government and NGOs?
- A7. DOE has developed a proposed test procedure for measuring TV power consumption in response to a petition received by the California Energy Commission and the Consumer Electronics Association stating that the test procedure developed in 1979 was no longer capable of accurately measuring the energy consumption of modern TVs. The original DOE test procedure, which was appropriate for measuring the energy efficiency of analog television sets only, was made obsolete on June 13, 2009, when full-power stations stopped broadcasting in the analog television service. The Department's proposed test procedure (77 FR 2830) is more applicable to modern TVs and digital broadcasting, and will help standardize energy consumption measurements across ENERGYSTAR, FTC, other Federal agencies, and other State and local governments.

DOE is aware of industry test procedure development efforts and is taking advantage of the lessons learned from private sector efforts. The proposed test procedure incorporates definitions, measurement specifications, and the on-mode, standby-passive, and off mode tests from the International Electrochemical Commissions standard IEC 62087-2011<sup>3</sup> and the standby-active, high mode test from the Consumer Electronics Association standard CEA-2037-2009<sup>4</sup>, while clarifying the procedures to ensure repeatability. The proposed test procedure improves upon the existing ENERGYSTAR test procedure (which is also

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<sup>3</sup> International Electrochemical Commission's (IEC) test procedure IEC 62087-2008, "Methods of measurement for the power consumption of audio, video and related equipment."

<sup>4</sup> CEA-2037-2009 "Determination of Television Average Power Consumption".

used by FTC for product labeling) by providing a more accurate representation of the power consumption of TV's with Automatic Brightness Control technology.

## QUESTION FROM REPRESENTATIVE WHITFIELD

**Q8a.** DOE is expending significant time and resources developing standards for products with limited energy use impacts, such as non-compressor refrigerators, thermoelectric cooling of wine chillers, vacuums, and clothes irons.

Why is DOE giving greater priority to developing standards for such products, while appliance standards for other products have fallen behind the schedules agreed to by industry, energy efficiency advocates and environmental and consumer groups?

**A8a.** DOE prioritizes rulemakings that are bound by statutory or other legal deadlines. For products not subject to statutory deadlines, such as wine chillers, vacuums and other miscellaneous residential and commercial equipment, DOE explores additional programmatic activity consistent with its statutory purpose. While the energy use of some of these products may not have grown as aggressively compared to the rate of electronic devices, which have required increased power for computing and internet connections, their energy use remains high. Significant variation in the annual energy consumption of different basic models also exists for many of these types of products and equipment, which indicates that technologies likely exist to reduce their energy consumption. Accordingly, on January 24, 2012, DOE requested information from the public on the energy use of a variety of miscellaneous residential and commercial electrical equipment and is evaluating its next steps for these products. DOE is also aware of its other rulemaking obligations. For rulemakings that have fallen behind schedule, DOE is working towards completion of the final rules as expeditiously as possible and will prioritize them in the context of DOE's other rulemaking obligations.

**Q8b.** Please explain how DOE prioritizes its appliance standards work.

**A8b.** DOE prioritizes its appliance standards work primarily based on its statutory and other legal obligations including settlement agreements that resulted from past litigation. DOE

is committed to complying with all applicable appliance standards deadlines and uses them to build its schedule. DOE also conducts test procedure rulemakings in support of the voluntary ENERGY STAR program, in coordination with EPA. DOE explores additional programmatic activity consistent with its statutory purpose, which among other things is: to conserve energy supplies through energy conservation programs, and, where necessary, the regulation of certain energy uses; to provide for improved energy efficiency of consumer products and industrial equipment; to provide a means for verification of energy data to assure the reliability of energy data; and to conserve water by improving the water efficiency of certain plumbing products and appliances. Some of the factors that DOE considers when prioritizing work that is not bound by statutory or other legal obligations are: DOE's regulatory authority for the product, the national energy consumption of the product, the average efficiency of products on the market, the potential for efficiency improvements, and stakeholder petitions.

## QUESTION FROM REPRESENTATIVE WHITFIELD

- Q9.** A September 2011 GAO report on the Energy Star program stated that:  
*“EPA and DOE officials told us that they were aware of concerns about having two verification testing programs and that they are working closely to coordinate their efforts and minimize the potential for duplication between their respective testing programs.”*

Please explain why DOE is spending federal dollars to implement a duplicative testing program for the Energy Star program when EPA already has a program that requires independent, third party testing paid for by Energy Star partners.

- A9.** DOE and EPA work together to minimize duplicative verification testing for the ENERGY STAR program. The DOE verification program helps ensure that ENERGY STAR products deliver the efficient use of energy and water that consumers expect, while minimizing costs and inconvenience to product manufacturers. DOE understands that both certification bodies and DOE conduct verification testing on ENERGY STAR products; however, the two programs are complementary. The DOE program tests a subset of ENERGY STAR products that are covered by DOE's regulatory program and targets testing based on a variety of factors including, but not limited to, qualification date, proximity of rated value to the ENERGY STAR specification, and history of manufacturer not meeting ENERGY STAR specifications. DOE does not intend to duplicate EPA's testing, but rather supplement it by enabling targeted testing of a larger percentage of basic models on the market. DOE's ENERGY STAR verification testing program identified 10% of models tested in both 2010 and 2011 as not meeting ENERGY STAR specifications, demonstrating its value as a supplemental testing program. EPA's verification program is conducted through third-party certification bodies who test at least 10% of ENERGY STAR certified basic models. Half of these models are selected randomly and the other half nominated by EPA based on factors such as sales volume, referrals from utility partners and manufacturing partner compliance history. Both

**programs are sensitive to the testing burden and have developed testing policies accordingly.**



## QUESTION FROM REPRESENTATIVE WHITFIELD

**Q10a.** On February 10, 2012, DOE issued a notice of proposed rulemaking on efficiency standards for liquid-immersed, medium voltage electric distribution transformers.

Is DOE aware that the proposed efficiency standards, as they currently stand, are acceptable to numerous stakeholders, including electric utilities, transformer manufacturers, and manufacturers of electrical steel?

**A10a.** DOE published a Notice of Proposed Rulemaking (NOPR) on February 10, 2012, in which it proposed standards for distribution transformers and invited the public to comment on those standards. In addition, DOE supported a series of negotiation meetings prior to the NOPR during which stakeholders had the opportunity to comment on the proposed rulemaking and respond to one another in real time. These negotiations produced valuable comments from the spectrum of stakeholders on a number of issues related to liquid-immersed distribution transformers. On June 20, 2012, DOE held another public meeting to discuss additional information about the liquid-immersed distribution transformer product class. The comment period closed on June 29, 2012 and DOE is considering all comments received as part of the rulemaking. Stakeholder comments are a critical source of information and feedback in helping DOE meet its statutory obligation to set the highest standard that is technologically feasible and economically justified, and will result in significant energy savings. DOE is aware of the positions of all stakeholders who submitted comments, including electric utilities, transformer manufacturers, and manufacturers of electrical steel, as well as energy efficiency and consumer advocates and other interested parties.

**Q10b.** Is DOE aware that any increase in efficiency standards beyond those proposed would, in all likelihood, require the use of amorphous steel—a product that may impact the cost and availability of transformers, driving up electricity rates and impacting the domestic electrical steel manufacturing base?

**A10b. DOE is aware that there is a point, which varies by transformer type, beyond which amorphous steel is required. Because setting a standard at or beyond this point could reshape the market, DOE has sought to understand where this point lies for each transformer so that DOE has adequate and pertinent information upon which to base its standard. DOE received comments on this matter from several stakeholders. The issue has been discussed at great length during negotiations and public meetings. DOE will consider all stakeholder comments, including ones related to this issue, as part of the ongoing rulemaking.**

**Q10c. Does DOE intend to issue a final rule with efficiency levels greater than those in the proposed rule?**

**A10c. DOE published a Notice of Proposed Rulemaking (NPR) on February 10, 2012, in which it proposed standards for liquid-immersed, medium voltage electric distribution transformers and invited comment on those standards. Stakeholder comments are a critical source of information and feedback in helping DOE meet its statutory obligation to set the highest standard that is technologically feasible and economically justified. Based on comments received from a diverse set of stakeholders in response to the NPR and statements made at the February 23, 2012, public meeting, DOE chose to conduct supplemental analyses on additional efficiency levels for some liquid-immersed medium voltage electric distribution transformers. The analyses considered more stringent efficiency levels for some types of liquid-immersed, medium voltage electric distribution transformers and less stringent efficiency levels for other types of liquid-immersed-medium voltage electric distribution transformers. DOE conducted a public meeting on June 20, 2012 where stakeholders commented on the analyses presented. The comment**

period closed on June 29, 2012 and DOE is considering all comments received as part of the rulemaking. These comments will be addressed in the final rule.

## QUESTION FROM REPRESENTATIVE WHITFIELD

**Q11a.** Section 312 of the Energy Independence and Security Act of 2007 requires walk-in coolers and walk-in freezers to meet certain technical specifications and also requires DOE to establish performance-based energy efficiency standards for walk-in coolers and walk-in freezers.

Do you support innovative technologies that would allow walk-in coolers and walk-in freezers to meet or supersede efficiency standards?

**A11a.** As part of EISA 2007, Congress enacted a set of requirements that required walk-in coolers and walk-in freezers to be built using specific types of technologies and components in order to be eligible to be sold in the United States. Language inserted by DOE. In its current rulemaking, DOE is evaluating whether to establish a performance-based energy efficiency standard for this equipment beyond the design requirements that Congress has already required all manufacturers to meet. DOE is always interested in exploring the use of innovative technologies wherever possible, and seeks a regulatory approach that could encourage the development of more advanced methods of achieving those energy savings while minimizing costs to consumers and maintaining product utility and performance.

**Q11b.** Do you have the authority to waive the technical specifications of Section 312 so long as a walk-in cooler or walk-in freezer would nevertheless meet or exceed DOE energy efficiency standards?

**A11b.** No. The prescriptive-based standards were set by Congress in EISA 2007 and DOE does not have the authority to waive those standards.

**Q11c.** If not, would you be supportive of legislative efforts to amend Section 312 so that walk-in coolers and walk-in freezers that meet or exceed energy efficiency standards may be manufactured and utilized, even if they do not meet the Section 312 technical specifications?

**A11c. The Department of Energy's communications with Congress must be carried out within the guidelines set out in law and in OMB Circulars A-11. A-11 notes that "... (agency representatives) must be aware of the following limitation on communications: "...An officer or employee of an agency may submit to Congress or a committee of Congress an appropriations estimate or request, a request for an increase in that estimate or request, or a recommendation on meeting the financial needs of the Government only when requested by either House of Congress" (31 U.S.C. § 1108(e)).**

**The Administration will provide an official position, when deemed appropriate, through the formal Executive Branch process for reviewing proposed legislation.**

## QUESTION FROM REPRESENTATIVE SHIMKUS

- Q1a.** In your testimony before the Senate Energy & Water Appropriations on March 14<sup>th</sup>, 2012, you indicated that several states have expressed interest in hosting temporary storage of spent fuel.

Please provide a list of all states, counties, cities, tribes, or any other organizations who have met with DOE officials to discuss any aspect of siting or developing new spent fuel or high-level waste storage or disposal facilities. Please include the dates of those meetings and the names of DOE personnel in those meetings.

- A1a.** As the Secretary testified, several entities “are beginning to show interest” in a spent fuel or high-level waste storage or disposal facility. To ensure that nuclear power continues to be a safe, reliable resource for our nation’s long-term energy supply and security, the United States must put in place a sustainable fuel cycle and used fuel management strategy. To advise the Administration, Secretary Chu convened the Blue Ribbon Commission on America’s Nuclear Future (BRC). This expert panel completed their final report and recommendations in January of 2012. The Administration is giving full consideration to the BRC recommendations as we work to define a path forward. The Administration will be providing additional information later this year, and will work with Congress to implement a new strategy to manage our nation’s used nuclear fuel and nuclear waste. DOE has not engaged in any meeting with outside entities to discuss specific proposals for siting or developing a DOE spent fuel or high-level waste facility or entered into negotiations regarding such matters.

- Q1b.** In the Energy and Power Subcommittee hearing on March 8<sup>th</sup>, you indicated that you would need to set up a process before meeting with Nye County, Nevada, officials about their request to begin cooperative negotiations concerning hosting the proposed repository. Please provide a copy of the process developed prior to DOE meetings listed in the above question.

**A1b. As explained above, the Administration is giving full consideration to the BRC recommendations as we work to define a path forward. The Administration will be providing additional information later this year, and will work with Congress to implement a new strategy to manage our nation's used nuclear fuel and nuclear waste.**

**QUESTION FROM REPRESENTATIVE SHIMKUS**

**Q2. From the beginning of FY 2009 to present, has DOE provided to Members of Congress or their staff any draft legislative text or comments to draft legislative text pertaining to spent fuel management or storage? If so, describe the legislation and comments and please provide copies of all drafts and comments for the record.**

**A2. DOE has no documents that meet the request.**



### **QUESTION FROM REPRESENTATIVE SHIMKUS**

- Q3. Please provide the most recent analysis of the additional costs to the taxpayer for the continued storage of Defense spent fuel and high-level waste resulting from DOE's failure to begin disposing of waste in 1998?**
- A3. There is no near term impact to the DOE sites. Currently, the Department is working to treat and package the defense related HLW and SNF at its sites for continued safe interim storage and future disposal. These activities are expected to continue for several decades. While interim storage can continue safely onsite many years, permanent disposition is ultimately needed for the Department to complete site cleanup activities and fulfill regulatory commitments.**

**QUESTION FROM REPRESENTATIVE SHIMKUS**

**Q4. Please provide the current total of litigation costs, since 1998, of DOE's defense in lawsuits pertaining to the Nuclear Waste Policy Act.**

**A4. The Department of Justice (DOJ) litigates issues related to the Nuclear Waste Policy Act.**

**As such, DOJ would have information concerning litigation costs and questions would be best answered by that Department.**

## **QUESTION FROM REPRESENTATIVE SHIMKUS**

**Q5. In the President's 2013 budget for the DOE, \$10 million was requested from the Nuclear Waste Fund. Please provide a detailed summary of how and on what this money would be spent.**

**A5. Consistent with the Blue Ribbon Commission recommendation to promote the better integration of storage into the waste management system, including standardization of dry cask storage, DOE will develop standardized container specifications with industry and award contracts to vendors to design standardized containers. This is also consistent with direction in the FY 2012 appropriations for development and licensing of standardized transportation, aging, and disposition canisters and casks.**

**In the area of transportation, DOE will finalize transportation procedures for technical assistance to States and tribes consistent with section 180 (c) of the Nuclear Waste Policy Act, will initiate pilot training programs for emergency responders along those routes from decommissioned sites, and will expand interaction with Transportation Stakeholders.**

## QUESTION FROM REPRESENTATIVE BARTON

**Q1. Please describe each change that has been made to the policies, practices or procedures of the DOE Loan Programs Office since January 1, 2011, and the date the new policy, practice, or procedure was implemented.**

**A1. The Loan Programs Office follows the requirements of its authorizing statutes: Title XVII of the EAct of 2005, creating the 1703 program; the American Recovery and Reinvestment Act of 2009, creating the 1705 program; and the Energy Independence and Security Act (EISA) enacted, creating Section 136 of the ATVM Loan Program.**

**In addition, each of the policies and procedures implemented by the LPO to effectively underwrite and monitor energy projects is set forth in the Program's policies and procedures documentation which is regularly reviewed and updated as appropriate..**

**In addition, over the past two years, the Loan Programs Office has completed the following improvements:**

**1) Increased Efficiency and Effectiveness (date implemented: ongoing)**

**LPO increased our staff and are now able to process applications more efficiently and effectively.**

**2) Ramp up of Portfolio Management Division (date implemented: ongoing)**

**The Department monitors the health of its loan recipients in much the same way that commercial lenders and other federal project lenders do, with a dedicated portfolio management division staffed by asset monitoring and credit review professionals in conjunction with internal legal and engineering teams and assisted by third party collateral agents, outside counsel, and other third party specialists. The Department's**

Portfolio Management Division monitors all aspects of the business condition of DOE's borrowers and their key counterparties including industry developments, changes in the competitive landscape, and business performance of the project parties. The purpose of such a comprehensive monitoring effort is to enable the Department to be proactive in changing plans, seeking additional funding, or suspending disbursements if necessary, with the goal of keeping options open to minimize risk and maximize loan recovery while meeting policy objectives.

3) Standardized Term Sheet and Form Loan Agreement (date implemented: see below)

While the terms of a deal are different for every project, there are provisions that are required for most deals. LPO created a form term sheet and a form loan agreement that are used as the starting point for the term sheets and loan agreements for all transactions. These forms are modified, as necessary, for each particular transaction, but create a consistency that did not previously exist. LPO was using a form term sheet in the fall of 2009, which was substantially modified in the spring of 2010. The first version of the current form loan agreement began being used in the beginning of 2011.

4) Streamlined NEPA (date implemented: 9/09)

LPO worked with other federal agencies to avoid duplication of the NEPA review process and, for example, to take advantage of BLM "Fast Track" NEPA review process. We conducted webinars and included detailed information about the NEPA process on the website to better inform and educate potential applicants. We also increased NEPA

staff and implemented internal pre-briefings in order to reduce the time required for internal reviews and approvals of NEPA documents.

5) Targeted Solicitation Model (date implemented: 8/10)

LPO developed a model for issuing more targeted and understandable solicitations for applications, as exemplified by the Program's manufacturing solicitation. The Department designed and organized the manufacturing solicitation to provide greater transparency into application requirements, evaluation processes, schedules and fees. LPO expects simplified solicitations to result in better applications that will more directly address the critical issues and that can be reviewed more efficiently and effectively by our staff.

6) Online Application Portal (date implemented: 8/10)

LPO created a new online portal for completing and submitting applications, which has both improved the quality of applications and shortened the amount of time that it takes to complete and process them. In the past, project sponsors may have taken days, even weeks, preparing necessary documents by either sending them via mail or submitting them through an unreliable legacy system. These methods were often cumbersome, confusing for the applicant and time-consuming for DOE staff reviewing the applications. We were able to expedite the application process by replacing the old system, which comprised of a series of highly manual steps of data collection and review to a 100 percent Web-based, automated portal with front-end data collection and back-end review

automation. It used to take DOE up to 2-3 months to complete the initial review of an application. We can now complete that review in less than two weeks.

7) New Web Site (date implemented: 9/10)

LPO redesigned and launched a more user-friendly website with more detailed information, a glossary of terms, and frequently asked questions. The site also includes project-specific information, and a prominently displayed feedback function, which allows for anonymous comments on the program. This anonymous input supplements the other feedback that the program continuously solicits from a wide array of stakeholders and interested parties.

## QUESTION FROM REPRESENTATIVE DINGELL

Q1a. It has been a year since your Loan Programs Office approved a loan from the Advanced Technology Vehicles Manufacturing program. As you know, the ATVM program was created to provide the automotive industry incentives to build or expand manufacturing facilities here in the U.S. instead of taking those jobs overseas. Loan recipients such as Ford and Nissan have successfully built or expanded facilities in Michigan, Tennessee, Illinois, Kentucky and other states.

Is the Loan Programs Office working to streamline their approval process so applicants can be assured they will not be waiting for years to find out if their application will be approved?

A1a. The ATVM program seeks to provide loans to applicants that can produce products that meet or exceed the 125% of the 2005 base year standard, as outlined Section 136 of the Energy Independence and Security Act of 2007. The program continues to follow its mandate to increase manufacturing capacity for innovative, more fuel efficient vehicles and underlying components across the United States.

Every ATVM application is unique and its review process can include significant due diligence. That due diligence requires a full understanding of the design, development, manufacturing, and market plan, as well as an understanding of the quality of the management team and investors. ATVM loan negotiations must take into account the reasonable prospect of repayment and complex negotiations may result in applicants revising their initial application (e.g., updated business plans) which can extend the review process time period.

Each applicant must provide sufficient information and materials in accordance with ATVM rules and guidelines in order for an application to be deemed substantially complete. Once an application becomes substantially complete, it can then be considered



by ATVM staff for a loan. However, an application becoming substantially complete does not necessarily indicate that an applicant's business plan, technology, market strategy or financial position are fully viable, or that they will meet all criteria necessary to obtain a DOE loan. This issue is compounded by a noticeable lack of barriers to entry for applications to the program, with no application fees and the program's obligation to review all submissions without regard to the quantity or quality of the initial information submitted. First, reviewing applications with a low probability of successfully completing the loan process diverts ATVM resources from consideration of more viable projects. Secondly, despite clear communications to the contrary, many applicants whose applications are found to be substantially complete often feel a major hurdle has been overcome and a loan agreement cannot be far behind, not understanding the full scope and extent of the DOE's rigorous due diligence process.

DOE has made tremendous progress thus far, including the approval of nearly \$8.4 billion in loans for projects that are expected to retain or create nearly 40,000 jobs. The Department takes our responsibility to protect taxpayer interests very seriously and take every means necessary to identify and mitigate risks before a project receives final approval for a loan.

The ATVM Loan Program constantly looks for ways to improve the program. During the last two years, the program has implemented several changes to the program in order to better serve the applicants and tax payers. These improvements include, but are not limited to:

- Increased Staffing and Market Knowledge: We have increased both our federal and contractor support of the ATVM Loan Program, and with each deal we become more engaged in that ATV and ATV Component market and more efficient in evaluating the proposed projects.
- Deployed new ATVM Portal: We recently deployed an update to the ATVM LP portal to make it easier for potential applicants to learn about the program, find and access key documents, and submit their loan application online.
- Hosted ATVM Webinar: We recently hosted an ATVM Loan Program Webinar where we provided an overview of the ATVM Loan Program, information on the new portal deployment, and a breakdown of the Eligibility and Applicant requirements. The presentation was followed by a Question & Answer session where ATVM leadership provided responses to any questions which the audience had.

The ATVM Loan Program has also taken further steps to pave the way for both a smooth application and due diligence process, including the publication of a *Guidance for Applicants* document on the program website; the early and proactive involvement of the program's credit, legal and technical teams in all ATVM evaluations; and the structuring of basic terms as early as possible during the preliminary due diligence phase to offer applicants an opportunity to make a go/no-go decision on their pursuit of a loan, sooner.

These processes are the result of well over three years of experience in processing loan applications for the program. The ATVM team has also taken steps since early 2012 to

reach out to the automotive industry via public forums in an attempt to inform and encourage financially viable and technically meritorious applicants to submit new, comprehensive applications. In addition, proactive pre-application communication will help facilitate shorter loan application processing times allowing applicants access to ATVM staff to answer questions on targeting application materials. These ongoing efforts have led to initial interest by a number of major automotive OEMs who are currently considering applying to ATVM.

The program will continue to work with remaining applicants, with an aim to communicate application status and moving the process forward in a timely manner. The ATVM Loan Program continues to be an attractive source of funding for automotive manufacturers of vehicles and components.

Q1b. Has the Loan Programs Office implemented any of the Allison Report recommendations to protect taxpayer dollars and provide a uniform system for evaluating loan applications?

A1b. Former Assistant Secretary of the Treasury for Financial Stability Herbert Allison reviewed DOE's Loan Guarantee Program and provided a report, dated January 31, 2012, on the current status, credit characteristics, and risk of loss of DOE's portfolio of loans. While the report confirms that DOE's overall portfolio of loans is expected to perform well, it also includes a number of recommendations on how to improve the management of the loan program and ongoing monitoring of the loan portfolio. DOE is reviewing those recommendations to determine the best way to use them to further strengthen the program.

The Alison report also noted that DOE is not a “passive bystander;” that is, DOE currently has the ability to reduce or mitigate risk in the portfolio over time and has “robust tools” for protecting itself from elective risk. These tools include strong covenants in all loan commitments issued after mid-2010 that allow DOE to control the amount of additional risk it assumes.

## QUESTION FROM REPRESENTATIVE DINGELL

Q2a. I'm concerned about lack of funding directed at the Facility for Rare Isotope Beams, or FRIB, within the Nuclear Physics Program. I'm told that the funds allocated to FRIB in the Fiscal Year 2013 budget are not enough for them to start construction this year. As of now the project is on-time and under-budget. Furthermore, the facility will generate five thousand construction jobs, four hundred permanent scientific positions, and have a \$1 billion economic impact.

I notice that in other programs within the Office of Science that the President is proposing to increase funding for scientific projects overseas. I believe that we should first ensure that we're meeting our project obligations here before sending our money and scientists abroad. Do you believe that as well?

A2a.

The FY 2013 request for the Office of Science continues its support of U.S.-based scientific projects. At the same time, the scale and cost of many scientific research projects has reached a point where international collaboration is essential.

International collaboration will help us maintain core competencies in key areas while providing our scientists with access to some of the best facilities in the world.

The potential payoff of modest investment is great, and any international efforts will leverage U.S. capability in a manner that amplifies U.S. leadership in areas of world-wide interest.

Q2b. Your Department has already invested \$50 million in the FRIB project. I am very concerned about the progress at FRIB, what is your commitment to FRIB in the future?

A2b. In the President's FY 2013 Budget, the Administration proposes funding for the Facility for Rare Isotope Beams equal to the FY 2012 enacted level of \$22 million. This request will keep this important and worthy project moving forward and reflects the priority the President places on FRIB, even in these tight budget times. We are hopeful that Congress will fund FRIB in FY 2013.

**Q2c. FRIB will have national security applications such as studying the detection of a nuclear weapon or dirty bomb detonation. I do not believe we can pursue these types of national N\V' security applications at overseas facilities. Can you briefly describe how you propose to balance these national security research needs versus commitments you believe we have with other countries?**

**A2c. It is expected that research at FRIB will have a national security role with aspects that touch on nuclear stewardship, forensics, and nuclear proliferation.. Support for FRIB is balanced within the FY 2013 budget request.**

## QUESTION FROM REPRESENTATIVE WALDEN

Q1a. Given your support for investing in programs that advance deployment of energy technologies of the future, I want to bring your attention a couple of companies in Oregon that are producing renewable energy from woody biomass – HM3 Energy and Bear Mountain Forest Products. Both companies are in the forefront of utilizing clean renewable biomass energy.

Do you believe Biomass is Carbon Neutral?

A1a. The combustion of biomass results in biogenic carbon emissions. The use of biomass for energy also usually results in the release of non-biogenic carbon emissions from the use of fossil fuels in the production, transport, and conversion of biomass. For this reason, and for other reasons where sequestered carbon may not be completely replaced in the carbon cycle, there may not be absolute zero carbon emissions when using biomass for energy. However, the use of cellulosic-based or other advanced biofuels can greatly reduce lifecycle carbon emissions compared to conventional, fossil-based transportation fuels.

The Department of Energy (DOE) fully supports a comprehensive and acceptable lifecycle accounting of both biogenic and fossil-fuel carbon emissions when comparing energy alternatives. A known difference is that the carbon from biomass fuels is from organic pools that will be more quickly replenished as part of the natural carbon cycle, as compared to fossil fuels. The Department views biomass as a viable source for energy because of the many inherent advantages with a portfolio of clean energy alternatives.

Q1b. Do you believe biomass is renewable?

A1b. All biomass is renewable and has the potential to be grown over and over again through natural, agronomic, and silvicultural cycles. More specifically, a focus of the Department

of Energy (DOE) is in ensuring a sustainable biomass feedstock supply from our Nation's many renewable resources. Efforts are ongoing to develop, demonstrate, and deploy technologies to overcome the barriers to the economic and sustainable use of biomass as a renewable, domestic energy source.

Q1c. What is DOE's policy on biomass?

A1c. Biomass can be a clean, renewable energy source that can help to significantly diversify transportation fuels and may also be used to produce high-value bioproducts (e.g., chemicals, etc.), power and home heating fuel, and its development is a high priority for the Department of Energy (DOE). The Department seeks to fund research, development, and demonstration (RD&D) projects to produce cost competitive biofuels from non-food, sustainable feedstocks. Under its loan guarantee authority<sup>5</sup>, DOE can enable deployment of first-of-a-kind commercial-scale biorefineries. This deployment policy helps de-risk future investment by the private sector in the build-out of subsequent plants.

Q1d. Is it not DOE's policy that the combustion of biomass fuel is considered carbon neutral?

A1d. Prior to funding any new concepts to produce biofuels, the Department carefully evaluates the lifecycle carbon emissions and the mass and energy balances associated with the production processes. DOE's policy is to ensure that any biomass fuel funded by DOE has long-term prospects for any biomass fuel of being produced domestically and resulting in a net reduction of lifecycle carbon emissions and fossil fuel consumption, considering the production, transport and conversion of the biomass feedstock to fuel.

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<sup>5</sup> Energy Policy Act of 2005, Title 17, Section 1703.



## QUESTION FROM REPRESENTATIVE WALDEN

### Biomass

Q2. Your opening statement reiterates the President's support for passing a Clean Energy Standard. Senator Jeff Bingaman on March 1, 2012 released his new Clean Energy Standard Act of 2012 (S. 2146).

Q2a. Do you support Senator Bingaman's CES bill?

A2a. The Administration has put forward several principles for the design of a Clean Energy Standard (CES). These include doubling clean electricity over the next 25 years, crediting a broad range of clean energy sources, protecting consumers from rising energy bills, ensuring fairness among regions, and promoting new and emerging clean energy technologies. Of course, there are many ways to design a CES to meet the President's goal. The Administration looks forward to working with the Chairman and with Congress on the critical work of ensuring American leadership in the clean energy economy.

Q2b. Do you believe that DOE would be able to manage a CES that has such a complex definition for biomass – given that the only biomass that could get credit is biomass that meets all of the elements of the definition, not just one or more of them?

A2b. The Administration is reviewing the legislation and will provide comments as the legislative process develops.

Q2c. Do you think biomass should be considered a "renewable energy" in the CES program?

A2c. The methodology for implementing the crediting of biomass in S. 2146 is contingent on a National Academy of Sciences (NAS) study. Without knowing the NAS implementation recommendations, we are unable to comment.

## QUESTION FROM REPRESENTATIVE WALDEN

### BPA Wind Integration “Environmental Redispatch”

- Q3. Nineteen bipartisan Members from the Pacific Northwest sent you a letter on January 24, 2012 describing our view that the environmental re-dispatch policy issues should be resolved in the region where we have along tradition of working together to resolve difficult challenges. These regional solutions would have to take into consideration the requirements of all statutes that are jurisdictional to BPA and would need to be both short term and long term in nature and make sense operationally and economically.

Do you support regional solutions to intermittent renewable integration issues as described above?

- A3. Yes. The Northwest Power and Conservation Council, BPA, and other regional parties have been working together on a process called the Oversupply Technical Oversight Committee (OTOC) since August 2011 as requested by the Wind Integration Steering Committee. The OTOC was tasked with developing physical long-term solutions to the region's oversupply conditions. The group is currently preparing to issue a final report, define next steps, and begin working on evaluating solutions where appropriate. BPA is implementing its Oversupply Management Protocol to displace energy on a least cost basis for spring 2012. This is a one year policy and BPA has committed to working with interested regional parties to find a durable long-term solution. Similarly, BPA is participating in the Northwest Power Pool's new Market Assessment and Coordination Committee (NWPP-MC). The NWPP-MC's objectives include generating long-term regionally supported commercial solutions to variable resource integration challenges. The Market Assessment and Coordination effort began on March 19 and utility participants have contributed financially to the support of this effort. A business case recommendation for executive review is expected by the end of 2012.

## QUESTION FROM REPRESENTATIVE WALDEN

### Rapid Response Team for Transmission (RRTT)

Q4. I would like to talk to you about the Rapid Response Transmission Teams that are set up to expedite the siting of transmission lines on federal lands in the west. About half of my district is owned by the Federal Government. I appreciate the fact that two proposed transmission lines in my district have qualified for consideration of the Transmission Team. The lines are Boardman to Hemingway and Cascade Crossing. The construction of these lines would create jobs. Their construction is critical to addressing reliability concerns, moving renewable energy to the load centers and creating jobs and economic growth. Also, the siting of these lines on Federal lands would avoid having to site them on productive private crop lands such as wheat and onion fields. It is important that where possible that transmission lines are sited on federal lands to avoid taking of private property. Since transmission lines serve the public good the public lands of the west should be used where practical to site such lines. It is important that these lines get sited as quickly as possible. Can you explain how this process is progressing?

A4. The Rapid Response Team for Transmission (RRTT) has completed site visits for five of its seven pilot projects . Specifically, the site visit for Boardman to Hemingway was completed on December 6-7, 2011, and Cascade Crossing on November 28-30, 2011.

Site visit participants have included Federal, state, and local agencies; Tribal representatives; and project proponents. During the site visits, the RRTT's goal has been to identify key issues and challenges and lessons learned in order to improve efficiencies in siting and permitting of transmission lines. From the results of these five site visits, the RRTT is currently delineating a number of goals; the nine agencies of the RRTT will then identify systemic changes within their agencies to accomplish these goals.

The RRTT published a Request for Information (RFI) to obtain public input on challenges due to incongruent development times between remote generation and attendant transmission facilities, and potential efficiencies that might be achieved in

federal regulatory processes to decrease the time agencies require to evaluate permits for transmission facilities. Comments on the RFI were received on March 28, 2012, and are currently being analyzed by the RRTT. Public comments are available here:

<http://energy.gov/oe/articles/comments-rfi-permitting-transmission-lines-available>

As systemic changes do not happen overnight, the accomplishments of the RRTT will take time. However, to date, the RRTT has continued with incremental improvements in the pilot projects and is at the threshold of identifying specific systemic changes that each agency will be undertaking.

## QUESTION FROM REPRESENTATIVE WALDEN

### Manufactured Housing

Q5a. A draft DOE rule to establish energy efficiency standards for manufactured homes is pending at OMB. It has been proposed in response to provisions in The Energy Independence and Security Act of 2007 (EISA; P.L. 110-140) to move HUD's statutory responsibility for manufactured home energy standards to DOE. This rule will result in two agencies – HUD and the DOE regulating manufactured housing.

Please provide the committee with an estimate of the cost to implement, enforce and update energy efficiency standards for manufactured homes as required by the EISA Act?

A5a. DOE currently is in the process of preparing a Notice of Proposed Rulemaking to implement section 413 of the Energy Independence and Security Act of 2007. If promulgated, this rulemaking would establish energy efficiency standards based on the energy efficiency provisions contained in the most recent version of the International Energy Conservation Code (IECC) and any supplements to that document, except where DOE finds that the IECC is not cost-effective or where a more stringent standard would be more cost-effective, based on the impact of the IECC on the purchase price of manufactured housing and on total life-cycle construction and operating costs. DOE issued an Advance Notice of Proposed Rulemaking on February 10, 2010, in which the agency sought public input on specific cost data applicable to the rulemaking. Because this rulemaking is still in the process of internal agency development, however, it is premature at this time to provide estimates on the implementation and enforcement costs associated with the proposed rulemaking.

Q5b. Please provide an estimate of the cost of coordinating DOE Standards with HUD's Manufactured Home Construction and Safety Standards, which also contain requirements for energy efficiency?

A5b. DOE is currently in the process of preparing a Notice of Proposed Rulemaking to implement section 413 of the Energy Independence and Security Act (EISA) of 2007. If promulgated, this rulemaking would establish energy efficiency standards based on the energy efficiency provisions contained in the most recent version of the International Energy Conservation Code (IECC) and any supplements to that document, except where DOE finds that the IECC is not cost-effective or where a more stringent standard would be more cost-effective, based on the impact of the IECC on the purchase price of manufactured housing and on total life-cycle construction and operating costs. DOE issued an Advance Notice of Proposed Rulemaking on February 10, 2010, in which the agency sought public input on the relationship between the U.S. Department of Housing and Urban Development (HUD) manufactured housing regulations and the DOE manufactured housing standards. Because this rulemaking is still in the process of internal agency development, however, it is premature at this time to provide estimates on any potential costs of coordinating the proposed standards with the energy standards contained in the HUD manufactured housing regulations.

## QUESTION FROM REPRESENTATIVE TERRY

Q1. In February 2011, just one month before this new final rule was published, the Administration issued Executive Order 13563 instructing agencies to adopt regulations upon a reasoned determination that the benefits justify the costs; that the regulations impose the least burden consistent with obtaining the regulatory objectives; and that agencies consider low-cost approaches that reduce burdens and maintain flexibility. How do the certification, compliance and enforcement rules issued by DOE comply with the spirit of E.O. 13563? What evidence does DOE have that creating a new verification program would be the most affordable and least intrusive means to achieving these policy goals?

A1. DOE's March 2011 final rule adopted revisions to its existing certification, compliance, and enforcement regulations for certain consumer products and commercial and industrial equipment covered under the Energy Policy and Conservation Act of 1975, as amended. This rule finalized a process started in 2010 to help provide a level playing field for manufacturers. DOE provided clarification and some minor modifications to the manufacturer submission of compliance statements and certification reports, maintenance of compliance records by manufacturers, and the availability of enforcement actions for improper certification or noncompliance with an applicable standard. Ultimately, the provisions allow DOE to systematically enforce the applicable energy and water conservation standards for covered products and covered equipment and provide for more accurate, comprehensive information about the energy and water use characteristics of products sold in the United States. DOE expects the impact of this rule on manufacturers to be minimal, as the rule does not impose any product specific requirements that would require manufacturers to make changes to existing plants, facilities, product specifications or test procedures.

DOE believes the certification requirements adopted in the March 2011 final rule are a

necessary implementation tool to help realize the energy savings associated with the energy conservation standards. The March 2011 final rule adopted electronic reporting in a streamlined process to ensure the least burden possible.

DOE does not have its own verification testing program. DOE conducts selective testing based on information it receives about potentially noncompliant products. Should DOE consider adopting provisions for a DOE-run verification program, it would investigate the cost and benefits of such a program at that time.



## QUESTION FROM REPRESENTATIVE TERRY

- Q2. Congress has already directed DOE to use third party certification for certain products. Both the Energy and Independence and Security Act of 2007 and the Energy Policy Act of 2005 clearly instruct the DOE to rely on third party certification programs for commercial refrigerators, furnaces, central air conditioners, and heat pumps when available. Despite this clear direction from Congress, why hasn't DOE relied on third-party certification programs for verification purposes? Does DOE believe it can be more effective than third party certification programs?
- A2. DOE's regulations allow manufacturers to use third-party programs to certify compliance to the Department on their behalf. DOE has specifically worked with certain third-party programs to develop a complementary submittal process for large-volume filers. While DOE's regulations provide the agency with the flexibility to test a product at any time, DOE does not have a formal verification testing program and welcomes verification information from third-party programs. Additionally, DOE routinely relies on the information shared from third-party verification programs as a tool for enforcing its standards.

## QUESTION FROM REPRESENTATIVE TERRY

Q3a. What is the cost to the government for implementing the March 7, 2011 rule? What is the estimated cost to industry and/or the consumer? If DOE moves forward with creating a duplicative verification program, what is the estimated cost for running this program? What, if any, is the incremental benefit of having the government run its own verification program?

A3a. The March 2011 final rule adopted revisions to DOE's existing certification, compliance, and enforcement regulations for certain consumer products and commercial and industrial equipment covered under DOE's appliance standards program. While many of these regulations existed prior to the effective date of the rule, DOE provided clarification of and minor modifications to the regulatory requirements regarding manufacturer submission of compliance statements and certification reports to DOE, maintenance of compliance records by manufacturers, and DOE's use of enforcement actions to address improper certification and noncompliance with applicable energy efficiency standard(s). The provisions adopted in this final rule allow DOE to enforce the applicable energy and water conservation standards for covered products and covered equipment more efficiently and effectively, and help provide the Department with more accurate, comprehensive information about the energy and water use characteristics of products sold in the United States.

DOE has not estimated the cost of implementing the March 2011 final rule, but it believes that the costs to industry and government were minimized as much as possible. In particular, the rule streamlined the process for manufacturer certification of compliance to the Department by implementing an electronic-only recordkeeping system that allows manufacturers to submit information online. Use of the on-line system has

reduced the burden on the government for processing certifications and has mitigated the cost of compliance for industry.

At this time, DOE does not have its own verification testing program. DOE conducts selective testing based on information it receives about potentially non-compliant products. Should the Department ever consider formally adopting provisions outlining a DOE-run verification program, it would investigate the cost and benefits that such a program could deliver.

- Q3b. Mr. Secretary, the President's Science Advisor recently stated his and the President's support for the Experimental Program to Stimulate Competitive Research (EPSCoR), which ensures that all states, including the state of Nebraska, participate in and benefit from federal science and engineering (S&E) research activities. At DOE, EPSCoR serves 28 states and three territories which collectively have about one-fourth of US research universities and which confer about 20 percent of the nation's higher education S&E degrees. In a year where you have proposed a substantial increase to the Basic Energy Science budget, why does the Department not correspondingly grow the EPSCoR program? In this year's budget request, why is the DOE EPSCoR budget only approximately one-fifth of one percent of the Office of Science budget despite the fact that the number of eligible jurisdictions continues to grow?
- A3b. Of the Office of Science projected university funding in FY 2013, EPSCoR states are projected to receive nearly 10% of the budget. Most of this funding is the result of EPSCoR states successfully competing for funding through regular DOE funding opportunities. The amount designated for the EPSCoR program is 1.2% of the total university grant budget, which is comparable to that allocated for other agencies with special programs for EPSCoR states. The FY 2013 proposed research increases in the Basic Energy Sciences budget, if appropriated, will be openly competed, and everyone in the EPSCoR states will be eligible to apply.

- Q3c. DOE draws upon the advice and expertise of academic leaders as it charts its future science and technology policies. It seems that very few if any of these advisors are drawn from the 28 EPSCoR states. Could you give some indication about this imbalance and would you pledge to work with the EPSCoR community to achieve some balance for future DOE advisory roles?
- A3c. The DOE Office of Science advisory committees are made up of representatives from scientific leaders from academia, industry, and national laboratories. Currently, all of the advisory committees in the Office of Science include representatives from EPSCoR states. The Office of Science also use the scientific community to help guide our strategic planning activities. For recent workshops held by the Basic Energy Sciences (BES) program, EPSCoR state representatives made up more than 15% of the participants. We will continue to utilize participation of scientific leaders from the EPSCoR states for these activities.
- Q3d. I would be interested in seeing a breakdown of Office of Science funding. Could you provide, by state, figures for the allocation of Office of Science funding for the three most recent years for which such funding is available. It would also be helpful if you could give us some indication of the main areas of science which were funded.
- A3d. The Office of Science university research portfolio delivers scientific discoveries to transform our understanding of nature and to advance the energy, economic, and national security of the United States. The research supports:
- ***Science for Discovery***, focused on unraveling nature’s mysteries—from the study of subatomic particles, atoms, and molecules that make up the materials of our everyday world to DNA, proteins, cells, and entire biological systems.
  - ***Science for National Need***, focused on advancing a clean energy agenda through basic research on energy production, storage, transmission, and use; and advancing our understanding of the Earth’s climate through basic research in atmospheric and environmental sciences and climate change.

The total Office of Science funding by state is also provided in the table below. This breakdown includes national laboratory funding as well as non-research funding for various operational purposes. Approximately 20% of the total funding supports activities in EPSCoR states. This breakdown includes the support for national scientific user facilities, which are largely located at the DOE national laboratories. Under District of Columbia, we include a statement saying the number reflects unallocated balances.

These facilities host over 26,000 users annually from academia, research laboratories, and industry.

- *National Scientific User Facilities*, the 21st century tools of science, engineering, and technology—providing the Nation’s researchers with the most advanced tools of modern science including accelerators, colliders, supercomputers, light sources and neutron sources, and facilities for studying the nanoworld.

Office of Science  
FY 2013 President’s Request  
Funding by State

(dollars in thousands)			
	FY 2011	FY 2012	FY 2013
Science			
Alaska			
Basic Energy Sciences	15	1	447
Biological and Environmental Research	892	.....	408
Fusion Energy Sciences Program	171	171	.....
Total, Alaska	1,078	172	855

(dollars in thousands)			
	FY 2011	FY 2012	FY 2013
<b>Alabama</b>			
Basic Energy Sciences	1,539	827	827
Biological and Environmental Research	671	344	347
Fusion Energy Sciences Program	1,389	989	640
High Energy Physics	503	440	275
Nuclear Physics	300	132	132
Total, Alabama	4,402	2,732	2,221
<b>Arkansas</b>			
Basic Energy Sciences	315	166	166
Biological and Environmental Research	230	.....	.....
Total, Arkansas	545	166	166
<b>Arizona</b>			
Advanced Scientific Computing Research	171	209	.....
Basic Energy Sciences	2,251	1,491	1,491
Biological and Environmental Research	759	1,281	576
High Energy Physics	1,561	1,237	1,278
Nuclear Physics	458	399	399
Total, Arizona	5,200	4,617	3,744
<b>California</b>			
Advanced Scientific Computing Research	142,958	118,999	111,070
Basic Energy Sciences	427,505	412,420	472,842
Biological and Environmental Research	188,474	163,750	164,168
Fusion Energy Sciences Program	96,331	89,075	67,134
High Energy Physics	174,976	155,393	151,801
Nuclear Physics	30,389	26,821	21,694
Program Direction	7,200	6,519	6,713
Safeguards and Security	9,737	7,803	7,474
Science Laboratories Infrastructure	60,757	37,085	58,011
Workforce Development for Teachers and Scientists	1,584	.....	.....
Total, California	1,139,911	1,017,865	1,060,907

	(dollars in thousands)		
	FY 2011	FY 2012	FY 2013
<b>Colorado</b>			
Advanced Scientific Computing Research	1,755	1,029	348
Basic Energy Sciences	18,101	15,888	15,888
Biological and Environmental Research	14,190	9,011	9,210
Fusion Energy Sciences Program	2,245	1,696	1,420
High Energy Physics	3,466	2,814	2,937
Nuclear Physics	693	344	344
Workforce Development for Teachers and Scientists	540	75	.....
<b>Total, Colorado</b>	<b>40,990</b>	<b>30,857</b>	<b>30,147</b>
<b>Connecticut</b>			
Basic Energy Sciences	4,141	2,620	2,620
Biological and Environmental Research	508	532	258
High Energy Physics	3,059	2,779	2,957
Nuclear Physics	3,547	3,493	3,493
<b>Total, Connecticut</b>	<b>11,255</b>	<b>9,424</b>	<b>9,328</b>
<b>District of Columbia (includes unallocated amounts in FY 2012 and FY 2013)</b>			
Advanced Scientific Computing Research	1,041	101,435	169,983
Basic Energy Sciences	15,198	101,506	148,268
Biological and Environmental Research	2,023	39,389	79,515
Fusion Energy Sciences Program	1,234	45,891	56,656
High Energy Physics	3,043	67,199	93,514
Nuclear Physics	22,295	52,890	56,504
Program Direction	69,562	76,711	85,691
Safeguards and Security	896	2,518	8,120
Science Laboratories Infrastructure	.....	.....	900
Workforce Development for Teachers and Scientists	355	12,574	14,500
<b>Total, District of Columbia</b>	<b>115,647</b>	<b>500,113</b>	<b>713,651</b>
<b>Delaware</b>			
Advanced Scientific Computing Research	338	79	.....
Basic Energy Sciences	2,997	1,620	971
Biological and Environmental Research	1,194	1,057	748
High Energy Physics	455	367	446
<b>Total, Delaware</b>	<b>4,984</b>	<b>3,123</b>	<b>2,165</b>

(dollars in thousands)			
	FY 2011	FY 2012	FY 2013
<b>Florida</b>			
Advanced Scientific Computing Research	187	150	100
Basic Energy Sciences	5,061	2,784	2,784
Biological and Environmental Research	1,757	1,835	1,007
Fusion Energy Sciences Program	456	347	.....
High Energy Physics	4,493	3,696	3,681
Nuclear Physics	1,320	1,320	1,320
<b>Total, Florida</b>	<b>13,274</b>	<b>10,132</b>	<b>8,892</b>
<b>Georgia</b>			
Advanced Scientific Computing Research	832	324	144
Basic Energy Sciences	7,123	4,442	4,442
Biological and Environmental Research	1,846	1,332	810
Fusion Energy Sciences Program	452	320	242
Nuclear Physics	590	291	291
Program Direction	1,895	.....	.....
<b>Total, Georgia</b>	<b>12,738</b>	<b>6,709</b>	<b>5,929</b>
<b>Hawaii</b>			
Basic Energy Sciences	656	344	344
Biological and Environmental Research	77	153	80
High Energy Physics	1,600	1,610	1,483
<b>Total, Hawaii</b>	<b>2,333</b>	<b>2,107</b>	<b>1,907</b>
<b>Iowa</b>			
Advanced Scientific Computing Research	6,546	6,000	6,000
Basic Energy Sciences	24,257	19,090	21,865
Biological and Environmental Research	1,755	715	858
Fusion Energy Sciences Program	360	205	207
High Energy Physics	1,988	1,842	1,639
Nuclear Physics	1,135	1,124	1,124
Program Direction	546	545	561
Safeguards and Security	1,007	993	910
Workforce Development for Teachers and Scientists	146	.....	.....
<b>Total, Iowa</b>	<b>37,740</b>	<b>30,514</b>	<b>33,164</b>



	(dollars in thousands)		
	FY 2011	FY 2012	FY 2013
<b>Idaho</b>			
Basic Energy Sciences	2,399	1,867	1,867
Biological and Environmental Research	1,449	1,190	.....
Fusion Energy Sciences Program	2,387	2,222	2,173
Nuclear Physics	110	95	95
Workforce Development for Teachers and Scientists	251	.....	.....
<b>Total, Idaho</b>	<b>6,596</b>	<b>5,374</b>	<b>4,135</b>
<b>Illinois</b>			
Advanced Scientific Computing Research	85,500	77,066	68,796
Basic Energy Sciences	248,587	328,742	386,910
Biological and Environmental Research	47,173	85,918	74,680
Fusion Energy Sciences Program	941	834	4,113
High Energy Physics	435,076	434,829	392,464
Nuclear Physics	32,351	50,747	55,125
Program Direction	44,089	41,053	44,524
Safeguards and Security	12,969	12,524	12,091
Science Laboratories Infrastructure	16,352	41,385	35,915
Small Business Innovative Research	163,036	.....	.....
Workforce Development for Teachers and Scientists	1,673	.....	.....
<b>Total, Illinois</b>	<b>1,087,747</b>	<b>1,073,098</b>	<b>1,074,618</b>
<b>Indiana</b>			
Advanced Scientific Computing Research	518	218	.....
Basic Energy Sciences	11,128	8,204	8,204
Biological and Environmental Research	1,298	659	796
Fusion Energy Sciences Program	1,394	1,240	1,240
High Energy Physics	3,915	3,168	3,715
Nuclear Physics	2,206	2,206	2,206
<b>Total, Indiana</b>	<b>20,459</b>	<b>15,695</b>	<b>16,161</b>
<b>Kansas</b>			
Basic Energy Sciences	3,467	3,072	3,072
Biological and Environmental Research	133	432	100
Fusion Energy Sciences Program	150	150	150
High Energy Physics	895	880	837
Nuclear Physics	340	340	340
<b>Total, Kansas</b>	<b>4,985</b>	<b>4,874</b>	<b>4,499</b>

(dollars in thousands)			
	FY 2011	FY 2012	FY 2013
<b>Kentucky</b>			
Basic Energy Sciences	863	761	761
High Energy Physics	105	105	96
Nuclear Physics	643	643	643
Total, Kentucky	1,611	1,509	1,500
<b>Louisiana</b>			
Advanced Scientific Computing Research	43	.....	.....
Basic Energy Sciences	3,621	2,860	2,860
Biological and Environmental Research	185	160	150
High Energy Physics	454	619	568
Nuclear Physics	232	232	232
Total, Louisiana	4,535	3,871	3,810
<b>Massachusetts</b>			
Advanced Scientific Computing Research	1,966	1,562	385
Basic Energy Sciences	17,762	14,546	14,546
Biological and Environmental Research	13,918	7,673	8,428
Fusion Energy Sciences Program	28,945	28,945	17,325
High Energy Physics	16,270	11,903	14,276
Nuclear Physics	9,348	3,132	3,132
Total, Massachusetts	88,209	67,761	58,092
<b>Maryland</b>			
Advanced Scientific Computing Research	2,350	494	365
Basic Energy Sciences	6,814	5,758	5,758
Biological and Environmental Research	3,070	2,260	2,195
Fusion Energy Sciences Program	3,036	1,947	753
High Energy Physics	2,977	2,899	2,790
Nuclear Physics	1,645	1,507	1,500
Program Direction	619	.....	.....
Total, Maryland	20,511	14,865	13,361
<b>Maine</b>			
Basic Energy Sciences	620	620	620

(dollars in thousands)			
	FY 2011	FY 2012	FY 2013
<b>Michigan</b>			
Basic Energy Sciences	13,619	6,377	6,377
Biological and Environmental Research	2,999	1,495	1,331
Fusion Energy Sciences Program	1,818	1,600	1,600
High Energy Physics	4,535	3,579	4,352
Nuclear Physics	11,849	8,830	1,830
<b>Total, Michigan</b>	<b>34,820</b>	<b>21,881</b>	<b>15,490</b>
<b>Minnesota</b>			
Advanced Scientific Computing Research	766	.....	.....
Basic Energy Sciences	2,120	1,609	1,609
Biological and Environmental Research	1,321	978	1,118
Fusion Energy Sciences Program	67	.....	.....
High Energy Physics	3,945	3,001	2,505
Nuclear Physics	470	470	470
<b>Total, Minnesota</b>	<b>8,689</b>	<b>6,058</b>	<b>5,702</b>
<b>Missouri</b>			
Basic Energy Sciences	8,545	8,035	8,035
Biological and Environmental Research	5,197	1,415	1,913
High Energy Physics	825	825	818
Nuclear Physics	888	888	888
<b>Total, Missouri</b>	<b>15,455</b>	<b>11,163</b>	<b>11,654</b>
<b>Mississippi</b>			
Basic Energy Sciences	275	2	2
Biological and Environmental Research	150	.....	.....
High Energy Physics	361	349	308
Nuclear Physics	598	594	594
<b>Total, Mississippi</b>	<b>1,384</b>	<b>945</b>	<b>904</b>
<b>Montana</b>			
Basic Energy Sciences	943	564	579
Biological and Environmental Research	131	.....	.....
Fusion Energy Sciences Program	65	65	.....
<b>Total, Montana</b>	<b>1,139</b>	<b>629</b>	<b>579</b>

(dollars in thousands)			
	FY 2011	FY 2012	FY 2013
<b>North Carolina</b>			
Advanced Scientific Computing Research	1,325	725	215
Basic Energy Sciences	2,977	1,260	1,260
Biological and Environmental Research	4,623	3,116	1,814
Fusion Energy Sciences Program	74	.....	.....
High Energy Physics	1,531	1,431	1,450
Nuclear Physics	7,489	7,267	5,937
<b>Total, North Carolina</b>	<b>18,019</b>	<b>13,799</b>	<b>10,676</b>
<b>North Dakota</b>			
Basic Energy Sciences	705	91	91
<b>Nebraska</b>			
Advanced Scientific Computing Research	15	.....	.....
Basic Energy Sciences	1,250	1,240	1,240
Biological and Environmental Research	130	.....	.....
High Energy Physics	.....	.....	14
Nuclear Physics	229	229	229
<b>Total, Nebraska</b>	<b>1,624</b>	<b>1,469</b>	<b>1,483</b>
<b>New Hampshire</b>			
Basic Energy Sciences	1,184	852	152
Fusion Energy Sciences Program	323	328	189
Nuclear Physics	415	394	394
<b>Total, New Hampshire</b>	<b>1,922</b>	<b>1,574</b>	<b>735</b>
<b>New Jersey</b>			
Advanced Scientific Computing Research	1,857	350	.....
Basic Energy Sciences	9,584	7,235	7,235
Biological and Environmental Research	4,938	2,115	2,984
Fusion Energy Sciences Program	78,187	71,859	59,673
High Energy Physics	4,640	3,085	4,178
Nuclear Physics	62	62	62
Program Direction	1,661	1,763	1,816
Safeguards and Security	2,397	2,232	2,128
Workforce Development for Teachers and Scientists	127	.....	.....
<b>Total, New Jersey</b>	<b>103,453</b>	<b>88,701</b>	<b>78,076</b>

(dollars in thousands)			
	FY 2011	FY 2012	FY 2013
<b>New Mexico</b>			
Advanced Scientific Computing Research	21,683	17,482	6,499
Basic Energy Sciences	74,226	65,967	68,167
Biological and Environmental Research	16,563	26,820	33,887
Fusion Energy Sciences Program	10,034	5,792	4,301
High Energy Physics	2,529	2,071	1,971
Nuclear Physics	12,692	10,586	9,622
Workforce Development for Teachers and Scientists	63	.....	.....
<b>Total, New Mexico</b>	<b>137,790</b>	<b>128,718</b>	<b>124,447</b>
<b>Nevada</b>			
Basic Energy Sciences	1,046	767	767
Biological and Environmental Research	542	375	.....
Fusion Energy Sciences Program	530	150	.....
High Energy Physics	200	200	.....
<b>Total, Nevada</b>	<b>2,318</b>	<b>1,492</b>	<b>767</b>
<b>New York</b>			
Advanced Scientific Computing Research	5,792	3,089	1,928
Basic Energy Sciences	277,787	277,916	216,469
Biological and Environmental Research	28,796	19,709	21,758
Fusion Energy Sciences Program	6,482	4,325	3,571
High Energy Physics	65,782	55,144	52,332
Nuclear Physics	190,198	185,182	182,668
Program Direction	4,876	4,870	5,027
Safeguards and Security	12,228	12,582	12,312
Science Laboratories Infrastructure	14,970	15,500	14,530
Workforce Development for Teachers and Scientists	2,182	202	.....
<b>Total, New York</b>	<b>609,093</b>	<b>578,519</b>	<b>510,595</b>
<b>Ohio</b>			
Advanced Scientific Computing Research	1,097	213	.....
Basic Energy Sciences	5,065	3,957	3,957
Biological and Environmental Research	757	691	347
High Energy Physics	3,142	3,182	3,010
Nuclear Physics	1,683	1,672	1,672
<b>Total, Ohio</b>	<b>11,744</b>	<b>9,715</b>	<b>8,986</b>

	(dollars in thousands)		
	FY 2011	FY 2012	FY 2013
<b>Oklahoma</b>			
Basic Energy Sciences	814	816	1,238
Biological and Environmental Research	1,238	1,629	657
Fusion Energy Sciences Program	242	242	.....
High Energy Physics	1,451	1,205	1,233
<b>Total, Oklahoma</b>	<b>3,745</b>	<b>3,892</b>	<b>3,128</b>
<b>Oregon</b>			
Advanced Scientific Computing Research	1,393	401	215
Basic Energy Sciences	1,223	1,133	1,133
Biological and Environmental Research	2,768	2,140	346
High Energy Physics	2,078	1,136	819
Nuclear Physics	260	260	260
<b>Total, Oregon</b>	<b>7,722</b>	<b>5,070</b>	<b>2,773</b>
<b>Pennsylvania</b>			
Advanced Scientific Computing Research	1,992	1,073	555
Basic Energy Sciences	17,114	8,486	8,486
Biological and Environmental Research	1,898	700	857
Fusion Energy Sciences Program	467	438	222
High Energy Physics	5,978	4,365	5,559
Nuclear Physics	2,369	2,296	2,296
Workforce Development for Teachers and Scientists	445	120	.....
<b>Total, Pennsylvania</b>	<b>30,263</b>	<b>17,478</b>	<b>17,975</b>
<b>Puerto Rico</b>			
Basic Energy Sciences	810	810	810
High Energy Physics	235	225	215
<b>Total, Puerto Rico</b>	<b>1,045</b>	<b>1,035</b>	<b>1,025</b>
<b>Rhode Island</b>			
Advanced Scientific Computing Research	627	266	172
Basic Energy Sciences	4,120	2,673	5,028
Biological and Environmental Research	188	25	.....
High Energy Physics	1,888	1,757	1,675
<b>Total, Rhode Island</b>	<b>6,823</b>	<b>4,721</b>	<b>6,875</b>

	(dollars in thousands)		
	FY 2011	FY 2012	FY 2013
<b>South Carolina</b>			
Basic Energy Sciences	3,509	3,346	3,346
Biological and Environmental Research	761	380	368
High Energy Physics	690	610	731
Nuclear Physics	102	102	102
<b>Total, South Carolina</b>	<b>5,062</b>	<b>4,438</b>	<b>4,547</b>
<b>South Dakota</b>			
Basic Energy Sciences	.....	.....	496
High Energy Physics	25	25	.....
Nuclear Physics	96	96	96
<b>Total, South Dakota</b>	<b>121</b>	<b>121</b>	<b>592</b>
<b>Tennessee</b>			
Advanced Scientific Computing Research	112,855	102,045	85,879
Basic Energy Sciences	341,383	319,172	317,998
Biological and Environmental Research	86,797	76,782	77,124
Fusion Energy Sciences Program	102,738	121,115	161,583
High Energy Physics	2,480	1,091	1,002
Nuclear Physics	41,453	26,436	23,483
Program Direction	54,167	46,458	50,920
Safeguards and Security	31,369	29,158	28,549
Science Laboratories Infrastructure	5,250	5,493	5,934
Workforce Development for Teachers and Scientists	14,077	5,295	.....
<b>Total, Tennessee</b>	<b>792,569</b>	<b>733,045</b>	<b>752,472</b>
<b>Texas</b>			
Advanced Scientific Computing Research	4,228	876	623
Basic Energy Sciences	11,776	8,342	8,342
Biological and Environmental Research	3,032	445	952
Fusion Energy Sciences Program	5,602	4,830	1,559
High Energy Physics	6,810	5,599	6,871
Nuclear Physics	5,877	5,603	5,603
<b>Total, Texas</b>	<b>37,325</b>	<b>25,695</b>	<b>23,950</b>

(dollars in thousands)			
	FY 2011	FY 2012	FY 2013
<b>Utah</b>			
Advanced Scientific Computing Research	1,717	215	215
Basic Energy Sciences	4,035	1,538	1,538
Biological and Environmental Research	1,235	1,042	283
Fusion Energy Sciences Program	241	227	138
High Energy Physics	61	.....	.....
Total, Utah	7,289	3,022	2,174
<b>Virginia</b>			
Advanced Scientific Computing Research	1,198	859	351
Basic Energy Sciences	10,710	6,724	6,724
Biological and Environmental Research	3,786	3,670	2,957
Fusion Energy Sciences Program	1,454	232	.....
High Energy Physics	3,709	3,641	1,478
Nuclear Physics	135,491	143,393	135,736
Program Direction	12,434	1,911	1,969
Safeguards and Security	1,668	1,446	1,386
Science Laboratories Infrastructure	28,419	12,337	2,500
Workforce Development for Teachers and Scientists	233	119	.....
Total, Virginia	199,102	174,332	153,101
<b>Vermont</b>			
Basic Energy Sciences	183	183	183
Biological and Environmental Research	158	141	146
Fusion Energy Sciences Program	33	33	33
Total, Vermont	374	357	362
<b>Washington</b>			
Advanced Scientific Computing Research	7,661	4,969	1,750
Basic Energy Sciences	32,005	24,453	25,754
Biological and Environmental Research	118,883	121,912	105,848
Fusion Energy Sciences Program	5,103	3,128	3,046
High Energy Physics	3,609	3,092	7,579
Nuclear Physics	7,536	6,981	6,092
Program Direction	5,471	5,170	5,330
Safeguards and Security	11,515	11,317	11,030
Workforce Development for Teachers and Scientists	924	115	.....
Total, Washington	192,707	181,137	166,429



(dollars in thousands)

	FY 2011	FY 2012	FY 2013
Wisconsin			
Advanced Scientific Computing Research	1,260	486	.....
Basic Energy Sciences	6,178	4,021	4,021
Biological and Environmental Research	26,229	25,756	25,795
Fusion Energy Sciences Program	14,107	12,600	10,356
High Energy Physics	4,238	3,467	3,664
Nuclear Physics	325	330	330
Total, Wisconsin	52,337	46,660	44,166
West Virginia			
Basic Energy Sciences	346	415	115
Fusion Energy Sciences Program	199	.....	.....
Total, West Virginia	545	415	115
Wyoming			
Advanced Scientific Computing Research	24	24	.....
Basic Energy Sciences	424	345	752
Biological and Environmental Research	524	530	528
Total, Wyoming	972	899	1,280
All Other (including foreign)			
Advanced Scientific Computing Research	622	230	.....
Basic Energy Sciences	135	135	135
Total, All Other	757	230	135
Subtotal, Science	4,912,283	4,873,634	5,001,156
Use of Prior Year Balances	-15,000	.....	-9,104
Total, Science	4,897,283	4,873,634	4,992,052

## QUESTION FROM REPRESENTATIVE CAPPS

- Q1. The United Kingdom is considerably outspending the U.S. in marine hydro kinetic technology development, deployment, testing, and particularly in supporting demonstration projects.

While I understand that the UK has a much greater tidal resource and that they are supporting this industry more than us over the years, the U.S. in-stream and wave resource is much greater and we do have a number of demonstration ready projects.

I appreciate the Department has used some of its funding from the Recovery Act and the Water program to support U.S.-based companies, including Ecomerit, in my congressional district.

But I'm concerned the U.S. may be ceding this technology to other nations if we fail to provide appropriate R&D funds and advance specific demonstration projects.

Can you share your thoughts on this growing industry with us? And perhaps also talk about the Department's commitment to support higher requests from the Administration in the budget out years for the water power program?

- A1. Subsequent to the authorities provided in the Energy Independence and Security Act of 2007, the Department developed a robust marine and hydrokinetic (MHK) portfolio through its Water Power Program. In an effort to be competitive in this emerging global market, we have actively supported a wide range of developers in these emerging renewable energy technologies, including several California-based companies and others across the United States. For example, the Department has provided funding for several tidal energy projects, including \$10 million for a project that is the first commercial tidal energy deployment in the nation, launching in the summer of 2012. The Department has provided over \$1 million to another company to improve its turbine blade design, which recently received a FERC Pilot License for a Tidal Energy Project. The Department has also provided \$2.4 million to a company that plans to deploy a 10-buoy wave energy project off the Pacific coast. As a final example, the Department has awarded over \$2

million in funding to support demonstration and array benchmarking for wave energy converter.

In addition to providing competitively-selected grants to a number of companies and universities that have advanced the technology readiness of MHK energy technologies over the past few years, the Department also supports testing and demonstration of these technologies. Over the past several years, the Department has supported competitively-selected National Marine Renewable Energy Centers (NMRECs) in the Pacific Northwest, Florida, and Hawaii with over \$17 million, including \$10 million for infrastructure at NMREC testing sites in FY 2012. Also in FY 2012, the Department announced that it will support in-water testing of a wave energy device in collaboration with the U.S. Navy at the Navy's Wave Energy Test Site in Hawaii.

The Energy Department's MHK activities planned for FY 2013 include developing a suite of wave, tidal, and current technologies, developing advanced open water test infrastructure for these devices, and research into the costs and performance of innovative MHK systems and components. The Department also anticipates completing resource assessments in FY 2012 and FY 2013 to accurately characterize all opportunities for water power development, including wave and in-stream hydrokinetic resource assessments conducted by the California-based Electric Power Research Institute. DOE intends to use data from ongoing techno-economic MHK assessments to establish baseline levelized energy costs for these new devices, which DOE will use along with resource assessments to establish priorities for future investments in innovative water power research and development.

## QUESTION FROM REPRESENTATIVE CAPPS

Q2. Your budget continues to support the energy frontier research centers, including UC Santa Barbara's Institute for Energy Efficiency in my congressional district.

We've already seen some spin off clean tech companies, like Transsphorm, gain support from this Research Center. I'm sure there are others around the country.

Can you please tell us how these mostly university-led teams are working to solve specific scientific problems that are blocking clean energy development and how they are helping to create jobs?

A2. Since their initiation late in FY 2009, the EFRCs have demonstrated scientific productivity as shown by publications, invention disclosures, patents and reported transfer of research results to companies and applied research efforts. As of May 2012, the EFRCs had authored over 2,400 peer-reviewed publications, including more than 60 in *Science* and *Nature*. There have also been 55 invention disclosures and 124 patents/applications, with at least 22 associated licenses.

More than 30 companies are benefiting from the results of EFRC research, including those from the Center for Energy Efficient Materials led by the University of California at Santa Barbara. Unlike smaller research awards, the EFRCs also typically have multi-institutional teams, bringing together leading researchers in diverse fields to work together on complex, use-inspired research challenges. We believe the centers provide a bridge between basic research and energy technologies and complement other research activities funded by the Department. Of the 46 EFRCs, 31 are led by universities, 12 by DOE National Laboratories, two by nonprofit organizations, and one by a corporate

research laboratory. The EFRCs are directly supporting over 2,000 researchers, including postdoctoral associates, graduate students, undergraduate students, and technical staff.

## QUESTION FROM REPRESENTATIVE CAPPS

Q3. Can you also tell us how these Frontier Research Centers complement ARPA-E and Energy Innovation Hubs?

A3. The Energy Frontier Research Centers (EFRCs), the Advanced Research Projects Agency – Energy (ARPA-E), and the Energy Innovation Hubs comprise a portfolio of energy R&D modalities that aim to maximize the Nation's ability to achieve energy breakthroughs as quickly as possible.

The following are synopses of the unique characteristics and roles of the Frontier Research Centers, ARPA-E, and the Energy Innovation Hubs and how they complement each other:

1. *Energy Frontier Research Centers* advance fundamental science relevant to real-world energy systems. Each focuses on the long term basic research needed to overcome roadblocks to revolutionary energy technologies in a particular area. They are mostly multi-institutional centers composed of a self-assembled group of investigators, often spanning several science and engineering disciplines. This research is both "grand challenge" and "use inspired" basic science motivated by the need to solve a specific problem, such as energy storage, photoconversion, CO<sub>2</sub> sequestration, etc. The choice of topics is at the discretion of the applicants in response to a FOA solicited broadly across grand challenge and use inspired science. The funding range is \$2-5 million per year per project.

2. *ARPA-E* supports research that is potentially high impact but is unlikely to attract private sector investment due to high technical and financial risk. ARPA-E follows the Defense Advanced Research Projects Agency's (DARPA) entrepreneurial approach to mission-oriented research by funding scientists and technologists to accelerate an

immature energy technology with exceptional potential beyond the risk barriers that make it unlikely to attract private investment. ARPA-E does not fund discovery science nor does it support incremental improvements to current technologies. Its federal Program Directors take a "hands on" approach to managing the activities of research teams. The funding range per project may be as low as \$500,000 or as high as \$10 million. Projects are selected on their potential to make rapid progress toward commercialization.

3. *Energy Innovation Hubs* each comprise a large set of investigators spanning science, engineering, and policy disciplines focused on a single critical national need identified by the Department. Talent drawn from the full spectrum of R&D performers—universities, private industry, non-profits, and government laboratories—drive each Hub to become a world-leading R&D center in its topical area. Each Hub's management structure allows empowered scientist-managers to execute quick decisions to shape the course of research. With robust links to industry, the Hubs aim to bridge the gap between basic scientific breakthroughs and industrial commercialization. Awards are openly competed among R&D performers and are for up to \$22 million in the first year and up to \$25 million in years two through five, for a maximum of up to \$122 million over the five year term, subject to Congressional appropriations.

The following table compares some of the characteristics and roles of each new energy R&D modality.

<b>Energy Innovation Hubs</b>	<b>Energy Frontier Research Centers</b>	<b>ARPA-E Projects</b>
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	<b>Energy Innovation Hubs</b>	<b>Energy Frontier Research Centers</b>	<b>ARPA-E Projects</b>
<i>Investigators and their institutions</i>	Large set of investigators spanning multiple science and engineering disciplines and possibly including other non-science areas such as energy policy, economics, and market analysis. May be led by Labs or universities, nonprofit organizations, or private firms. The model is the three existing Office of Science Bio-energy Research Centers.	Self-assembled group of ~12-20 senior investigators. May be led by DOE laboratories or universities. About two thirds of 46 EFRCs are led by universities.	Single investigator, small group, or small teams. May be led by Labs or universities, nonprofit organizations, or private firms.
<i>Central location?</i>	Lead institution must provide a central location and strong scientific leadership. There must be a culture of empowered central research management.	Mostly multi-institutional centers, but with a clearly defined lead institution responsible for management.	Variable depending on project
<i>Diversity of disciplines per award</i>	Many	Several	Few
<i>Period of award and management</i>	5 years. Managed by Offices across DOE. Program coordinated by a working group of senior program staff.	5 years. Managed by the Basic Energy Sciences program in the DOE Office of Science.	1-3 years. Managed by ARPA-E, whose Director reports to the Secretary of Energy
<i>Award Amount</i>	~\$22 million in the first year with up to \$10 million for infrastructure start-up; ~\$25 million per year in subsequent years.	\$ 2-5 million per year	\$ 0.5-10 million per award



	<b>Energy Innovation Hubs</b>	<b>Energy Frontier Research Centers</b>	<b>ARPA-E Projects</b>
<i>Core motivation</i>	Integrate from fundamental research through potential commercialization. The breadth and emphasis of activities will be influenced by the nature of the Hub. Some Hubs may place a greater emphasis on basic and applied research, while others may focus more on technology development. DOE determines the topical areas of the Hubs and FOAs are topic-specific.	Fundamental research with a link to new energy technologies or technology roadblocks. The investigators proposed the subject matter from among a large set of scientific grand challenges and energy-relevant topics identified in and the FOA.	High impact translational research driven by the potential for significant commercial impact in the near-term. In general, DOE determines the topics of interest, with the exception of occasional broad-based “open FOA’s” which were issued in 2009 and 2012.

## QUESTION FROM REPRESENTATIVE CAPPS

- Q4. What is your Department doing to coordinate with other federal agencies, particularly the Defense Department, that are either investing in clean energy technology development, deployment and testing or have a vested interest in purchasing clean power in the future.
- A4. The Department of Energy (DOE) and the Department of Defense (DOD) signed a Memorandum of Understanding (MOU) on July 22, 2010 entitled “Concerning Cooperation in a Strategic Partnership to Enhance Energy Security.” Also known as the “DOE - DOD Energy Security MOU”, the MOU establishes an Executive Committee to create an overarching, strategic process between the departments and allow their sub-components to “strengthen and broaden” existing efforts.

The Energy Security MOU Governance Charter is intended to provide a mechanism for the Parties to engage in interagency long-term strategic planning for capabilities that are unique to DOE and its National Laboratories. This will ensure that certain national security priorities can be supported by these unique capabilities in a coordinated, effective, and efficient manner.

The objectives of the Energy Security MOU are to:

- Provide a forum for the DOE’s and DOD’s leadership to identify and plan strategic collaboration of common interest in the area of energy security;
- Enable DOE and its National Laboratories to research, develop, test, or evaluate sustainable energy technologies relevant to DOD operational and installation functions;

- Create a framework for DOE and DOD to consider making collaborative energy security investment decisions;
- Facilitate communication between DOE and DOD to accelerate technical progress by avoiding duplication of effort and leveraging agency investments;
- Develop a mechanism for DOE and DOD to undertake long-term strategic planning of common interest to develop and sustain strategic capabilities of interest.

DOE and DOD agreed to appoint three senior executives to serve as Co-Chairs of the Executive Committee, including the Assistant Secretary of Defense for Operational Energy Plans and Programs Operational Energy Plans & Programs, the Deputy Under Secretary of Defense for Installations and Environment, and the DOE Assistant Secretary for Electricity Delivery & Energy Reliability.

#### **Key Project Areas:**

- **Alternative Fuels – *DOE-Navy-USDA Biofuels Commercialization:*** DOE, Navy and USDA are co-supporting several U.S. biorefineries capable of producing renewable diesel and jet fuel for commercial and military applications. This co-support leverages Title III of the Defense Production Act and the Commodity Credit Corporation. Collectively, the Agencies have agreed to contribute \$510 million to this effort with at least equal cost share from private industry for the duration of the initiative.

- DOE provided \$5 million to the Defense Production Act (DPA) Integrated Product Team (IPT)
  - Phase I: DOD/Navy \$30 million put into DPA fund in FY12 to support necessary engineering design and feasibility studies for this initiative.
  - Phase II: Funding used to build plants that are accepted through the Phase I process.
  - Navy has requested \$70 million in FY13 for DPA. DOE has requested \$40M in FY13. USDA will contribute \$171M in FY12-13.
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- **Vehicles R&D – *Advanced Vehicle Power Technology Alliance (AVPTA)*:** On July 18, 2011, DOE Deputy Secretary Poneman and DOD Under Secretary Westphal signed a charter to form the Alliance, run by DOE's Vehicle Technologies Program (VTP) and the Army's Tank Automotive Research Development Engineering Center (TARDEC). Subsequently, the joint partnership team developed a list of seven specific projects to be jointly funded and managed. Projects ranging from vehicle light weighting to computer-aided engineering of advanced batteries are already underway.
  - TARDEC has stationed a staff member at DOE Headquarters Vehicle Technologies Program to assist in coordination between TARDEC and DOE.
  - In addition to jointly participating and expanding existing projects, DOE and TARDEC are planning to jointly sponsor competitive solicitations on topics of mutual interest. In March of this year, DOE and TARDEC held

a contracting meeting to begin the planning for this inter-agency contracting process.

- DOE and TARDEC are conducting joint quarterly reviews of the Alliance progress and individual project progress, with the next review scheduled for late April.
  
- **Grid Security – *Smart Power Infrastructure Demonstration for Energy Reliability and Security (SPIDERS)***: DOE, Labs, DOD, Combat Commands (COCOMs) and Services collaboration with the private sector to design and deploy microgrid demonstrations at three DOD installations with a big focus on cyber security. This builds off of previous DOE and DOD investments.
  - Phase I: Joint Base Pearl Hickam-Harbor (HI), Fall FY12
  - Phase II: Fort Carson (CO), Spring FY13
  - Phase III: Camp Smith (HI), Spring FY14
  
- **Energy Storage – *Advanced Management and Protection of Energy-storage Devices (AMPED)***: ARPA-E will fund \$30 million in research projects under the AMPED program, which aims to develop advanced sensing and control technologies that could dramatically improve and provide new innovations in safety, performance, and lifetime for grid-scale and vehicle batteries. ARPA-E's AMPED program was announced in April, 2012 and is being closely coordinated with DOD's Hybrid Energy Storage Module Program (HESM), which is in the final stages of being formulated. ARPA-E's AMPED and DOD's HESM

programs seek to create future energy storage systems that combine endurance and rapid charge/discharge needs with reliable, reconfigurable solutions for a wide range of applications.

- **Building Energy Efficiency Technologies:** DOE's Building Technologies Program (BTP) and Federal Energy Management Program (FEMP) are working with the Office of Secretary of Defense on: 1) integrating building technologies in the smart grid alongside storage and demand response technologies; 2) technology screening, identifying technologies which will be tested by an independent lab to produce reports for consistent, educated procurement decisions; and 3) technology pilots and demonstrations.
- **Renewable Energy – *SunShot Technology Demonstrations*:** DOE's Solar Energy Technologies Program (SETP) will work with Office of the Secretary of Defense (OSD's) Energy Test Bed Program on testing and validating next generation solar energy technologies by installing two 1 MW solar test beds on military installations by 2014.
- **Advanced Manufacturing – *Pilot Manufacturing Institute*:** On March 9, 2012 President Obama announced the impending creation of a \$45 million an collaborative interagency effort. In April, an interagency team announced that the collaborative effort would focus on additive manufacturing. pilot Manufacturing Institute cosponsored by DOE (\$10M), DOD (\$15M) and Commerce (\$5M).

DOE is contributing contributed \$10 million to this effort. The joint agency team is reviewing applications for an institute focused on additive manufacturing. Each of the funding agencies will independently manage and administer their own elements of the pilot. This effort e Pilot Institute was initiated in response to the President's challenge to work together within existing resources and within existing authorities to demonstrate the concept behind the National Network for Manufacturing Innovation (NNMI). is part of Tthe NNMI is an Administration proposed mandatory \$1 billion program, the National Network for Manufacturing Innovation (NNMI), which that will support up to 15 institutes around the country. The NNMI is subject to Congressional authorization.plans to build 15 manufacturing institutes around the country as part of the FY13 budget. The joint agency team is discussing the development of an additive manufacturing institute.

- **Tactical Renewables:** DOE's SETP and Geothermal Technologies Program have engaged OSD to explore options for tactical geothermal in the field as well as deploying more cost- and mission-effective solar projects.
- **ARPA-E and Naval Facilities Command:** ARPA-E has executed a Collaborative Interagency Agreement with the Naval Facilities Engineering Command. The Navy is evaluating several projects in ARPA-E's Building Energy Efficiency through Innovative Thermodevices (BEETIT) Program. The Navy expects to select three to four BEETIT projects for a total of \$7.5 to \$9 million in follow-up research funding later in 2012. This collaboration aims to

adapt BEETIT technologies to the rigors and constraints of the expeditionary environment. This could reduce fuel consumption for heating and cooling in the expeditionary setting by 20% to 50%, thus reducing the number of fuel convoys and risks to DOD personnel.



## QUESTION FROM REPRESENTATIVE BURGESS

**Q1.** During the hearing on March 8 Chairman Emeritus Barton and I asked you to identify the names of the companies that are currently on the Loan Programs Office “Watch List.” You did not provide these names at the hearing, but you explained that your advisor, Mr. Richard Kauffman, would be briefing Committee staff the following week on the Loan Programs portfolio. During that briefing, Mr. Kauffman would not identify the companies on that list. Please identify each company that is currently on the Loan Programs Office “Watch List,” and explain why the company is listed.

**A1.** Public disclosure of companies currently on LPO’s Watch List would involve the release of proprietary and business-sensitive information that could adversely affect a company’s financial position. However, as background information, companies are placed on the Watch List when one or more of the following factors are present:

- Changes in the macro-economic environment, including regulatory changes;
- Changes in the business sector;
- Internal or market driven event that significantly alters the financial profile of the project company or increases cost of capital;
- Deteriorating financial profile and/or persistent operations inefficiencies;
- Significant construction delays;
- Significant issues with a major counterparty;
- Material changes in volume or quality of feedstock or production resources;
- Persistent technical difficulties with adverse cash flow impact;
- Major lawsuit judged by legal counsel to have the potential of adversely impacting cash flow;
- Loss of key management or frequent management turnover;
- Loss of material collateral or security;
- Termination/Loss of material contract;
- Significant environmental event;
- Management issues;
- Material (financially significant) product/recall or safety recall; and/or
- Occurrence of a force majeure event.

## QUESTION FROM REPRESENTATIVE RODGERS

Q1. Back in 2008, the President touted his commitment to increasing the use of hydropower. Yet, it appears that this Administration's commitment to renewable energy only includes intermittent sources and not the low cost, clean power that hydropower can provide. Would you comment?

A1. Hydropower is a clean, low-cost energy source that not only has a significant role in the renewable energy portfolio, but also plays an important role in electricity operation and the electrical power grid. Hydropower's quick response time has been critical to ensuring power grid reliability and security. Pumped-storage hydropower is the only reliable and cost-effective utility-scale energy storage available today.

The Department has supported water power for a number of years and plans to continue and complete a number of important hydropower research and development projects in the coming years. For example, DOE selected 16 new innovative hydropower technology development projects for funding in FY 2011, and that work will continue through FY 2013. DOE will also continue efforts under the Hydropower Advancement Project, which is developing standardized assessment guidelines for upgrades at existing hydropower facilities—one of the most cost-effective ways to add new renewable energy generation capacity in the United States. The Department is also continuing to support the development of clean, reliable, cost-effective and sustainable hydropower generation in the United States under a Memorandum of Understanding with the U.S. Department of the Army and the Department of the Interior. Additionally, the Department will continue analyses to quantify the benefits that conventional and pumped-storage hydropower provide to the electric grid, which can also support the integration of variable renewable resources like wind and solar. Finally, resource assessments are to be concluded in FY

2012 and FY 2013 to accurately characterize all opportunities for water power development, and these assessments will help to guide future investments.

## QUESTION FROM REPRESENTATIVE BILBRAY

Q1. With the independent consultant's work completed, when does DOE anticipate processing the outstanding loan applications? If there is no anticipated resumption date, please explain why?

A1. As you know, the §1703 loan program was adopted as part of the Energy Policy Act of 2005 to provide support financing to advanced technologies on reasonable terms. The 2011 appropriations provided an additional \$170 million in credit subsidy cost funding to support §1703 loan guarantees, and brought the balance of guaranteed loan volume authority to \$1.5 billion for projects where the credit subsidy cost is funded by the project sponsor.

Authority to enter into new loan guarantees under the §1705 loan program sunset September 30, 2011 – a deadline by which projects had to commence construction and close on their loans. Faced with a large volume of projects, but a limited number able to meet this deadline the Department sent letters in May 2011, to more than three dozen project sponsors, informing them that they would not meet the required deadline under §1705, but could be considered in the future for loan guarantees under the §1703 program. As the letter noted, this was not a statement of the quality or worthiness of those projects; it was simply a matter of timing.

Following the completion of the Independent Consultant Review by Mr. Herb Allison, the Department has developed a process for considering pending applications for the available §1703 funding. On April 5, 2012, the Department commenced this process by sending a letter to project sponsors with pending applications that may qualify for the

§1703 funding referred to above, asking them if they still wanted to be considered for a loan guarantee.

## QUESTION FROM REPRESENTATIVE BILBRAY

**Q2.** With limited funds available, does DOE anticipate prioritizing applicants who are willing to forego credit subsidies in order to maximize the total amount of loan subsidies?

**A2.** DOE's paramount responsibility remains its role as a steward of taxpayer funds. As such, once the applicant pool has been evaluated against the criteria outlined in the letter to applicants sent on April 5, 2012, it will use initial screening criteria consistent with Congress's mandate for the Section 1703 program and its governing documents.

Under the Consolidated Appropriations Act of 2012, Congress provided that the Department may combine an appropriation of credit subsidy with a direct payment from the borrower to cover the total cost of a loan guarantee, allowing DOE to distribute the appropriated credit subsidy across a broader array of projects and technologies. Any required credit subsidy costs that are not funded by appropriated credit subsidy must be paid by the borrower in full at closing.

### QUESTION FROM REPRESENTATIVE BILBRAY

Q3. In the independent consultant's report, he identified a category of loans which were inherently low risk, will the Department use category risk (e.g. projects backed with a PPA) level as a criteria to help expedite applications? What other criteria will be considered?

A3. While we are not limiting the funding to just those projects with guaranteed offtake agreements, the existence of an offtake agreement clearly strengthens an application and is one important factor that the Department considers as part of its underwriting process.

DOE's paramount responsibility remains its role as a steward of taxpayer funds. As such, it will use initial screening criteria consistent with Congress's mandate for the Section 1703 program and other governing documents.

Projects that are selected to move forward will undergo rigorous due diligence and loan underwriting review prior to issuance of any loan guarantee.

#### QUESTION FROM REPRESENTATIVE BILBRAY

Q4. Can you shed light as to the remaining appropriations available and as to the number and general nature of those applications?

A4. The exact number of projects and the total dollar value of the loan guarantees in this §1703 pipeline will depend on the government's assessment of the risk level of the projects selected.

Congress appropriated \$170 million in credit subsidy cost funding to support §1703 loan guarantees for renewable energy and energy efficiency projects . The Department estimates that these funds would support approximately \$1.1 billion to \$1.7 billion in loan guarantees. In addition, Congress has provided separate loan guarantee authority of \$1.5 billion for innovative renewable energy and energy efficiency projects, provided the project sponsor pays the associated credit subsidy cost.

More than three dozen applicants who were eligible for the 1705 program, but placed on hold because of our determination that they could not meet the September 30, 2011, deadlines, were sent letters on April 5, 2012, asking if they were interested in pursuing a loan guarantee under the 1703 program. The pipeline includes energy efficiency projects, as well as generation and manufacturing projects from a variety of renewable energy sectors, including solar, wind, geothermal, biofuels, and biomass.



## QUESTION FROM REPRESENTATIVE MURPHY

Q1. The Natural Gas Subcommittee of the Secretary of Energy Advisory Board expressed a desire for additional research related to shale gas. Please explain why you have ignored this recommendation from your own advisors and sought to seek to cancel the Natural Gas Technologies Program and other R&D programs established by the Energy Policy Act of 2005?

A1. The Natural Gas Technologies Program is not proposed for cancellation. The Administration is reprioritizing the Natural Gas Technologies Program and seeking \$12 million (for DOE) to launch a collaborative research and development (R&D) initiative together with the Environmental Protection Agency (EPA) and the Department of the Interior's U.S. Geological Survey to understand and minimize the potential environmental, and safety impacts of natural gas development through hydraulic fracturing consistent with high priority recommendations of the Secretary of Energy Advisory Board's (SEAB) August 2011 "Shale Gas Production Subcommittee Ninety-Day Report." Regarding mandatory R&D under the Energy Policy Act of 2005 (EPA 2005), the Administration believes that Section 999 of EPA 2005 is too inflexible a mechanism to adequately address environmental and safety concerns in the dynamic and rapidly evolving hydraulic fracturing space.

## QUESTION FROM REPRESENTATIVE MURPHY

Q2. Methane hydrates may possibly represent a unique and promising energy resource if they can be technically and economically produced. The Energy Department has been researching hydrates for a number of years and, as I understand, there is a hydrate related field test underway in Alaska at the present time. Hydrates are present in offshore areas and in the Arctic regions – both relatively extreme and costly settings to operate in. If, however, methane hydrates can instead become part of the nation's energy mix, the benefits could be significant. With such potential in methane hydrates, please elaborate on whether the Department believes a \$5 million for hydrate research in FY 13 is sufficient.

A2. Significant scientific work must be completed before methane hydrate can be considered a producible natural gas resource. The present challenge is to determine whether methane hydrate deposits can yield methane gas at the rates necessary to make high-cost Arctic or deep-water production commercially viable.

The \$5 million request in FY 2013 will support the next critical step in methane hydrate development in the U.S. Arctic region - the facilitation of a production test. Additional funding for this test is expected through international collaboration.

### QUESTION FROM REPRESENTATIVE MURPHY

Q3. The Department has historically supported technology development to solve problems facing smaller independent oil and gas producers through the Stripper Well Consortium at Pennsylvania State University. There are hundreds of thousands of wells in the U.S. that produce at marginal rates. With gasoline prices above \$4 a gallon, and the United States still running a trade deficit with OPEC nations in excess of \$120 billion, please explain why the Department's FY 13 request seeks no specific funding support for this program.

A3. The Administration's request focuses on collaborative research and development (R&D) with the Environmental Protection Agency (EPA) and the Department of the Interior's U.S. Geological Survey to understand and minimize the potential environmental, and safety impacts of natural gas development through hydraulic fracturing consistent with high priority recommendations of the Secretary of Energy Advisory Board's (SEAB) August 2011 "Shale Gas Production Subcommittee Ninety-Day Report."



**Department of Energy**  
Washington, DC 20585

September 13, 2012

The Honorable Paul Broun, M.D.  
Chairman  
Subcommittee on Investigations and Oversight  
Committee on Science, Space, and Technology  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On May 8, 2012, Dr. Kathleen Hogan, Deputy Assistant Secretary for Energy Efficiency, Office of Energy Efficiency and Renewable Energy, testified regarding "The Science Behind Green Building Rating Systems."

Enclosed are the answers to three questions that you submitted to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis", is positioned above the printed name.

Christopher E. Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Paul Tonko, Ranking Member



**QUESTION FROM CHAIRMAN BROWN**

**Q1. DOE issued a proposed rule on design standards for new federal buildings in May 2010. No final rule was ever issued. What is the status of this work and when do you expect the final rule to be issued?**

**A1. DOE issued the Notice of Proposed Rulemaking on May 28, 2010 in the Federal Register with a 60-day comment period. 75 FR 29933. DOE received substantial comments from 62 entities, including Federal agencies and private organizations. The draft final rule is currently under Executive Order 12866 review. Additional information can be found at [www.reginfo.gov](http://www.reginfo.gov).**

## QUESTION FROM CHAIRMAN BROWN

- Q2. Does the Department have the ability to develop its own standard for federal green buildings and would it support or oppose the developments of such standards?**
- A2. DOE is required under the Energy Conservation and Production Act, as amended, to establish sustainable design standards for new Federal buildings and certain major renovations of Federal buildings. (42 USC 6834(a)(3)(D)(i)(II) and (III)).**

**Also, pursuant to the Energy Conservation and Production Act, as amended, DOE also is required, following consultation with the General Services Administration and the Department of Defense, to identify a certification system and level for green buildings that DOE determines to be the most likely to encourage a comprehensive and environmentally-sound approach to certification of green buildings. DOE issued a Notice of Proposed Rulemaking on May 28, 2010 in the Federal Register with a 60-day comment period. 75 FR 29933. DOE received substantial comments from 62 entities, including Federal agencies and private organizations. The draft final rule is currently under Executive Order 12866 review. Additional information can be found at [www.reginfo.gov](http://www.reginfo.gov).**

### **QUESTION FROM CHAIRMAN BROWN**

**Q3. What comments does the Department have regarding Professor Oberlin's study on the cost effectiveness of LEED?**

**A3. We believe Chairman Brown is referring to Professor John Scofield of Oberlin College's recent testimony regarding his analysis of a study on the effectiveness of LEED by the New Buildings Institute (NBI). The Department of Energy (DOE) does not have specific comments on Dr. Scofield's analysis of NBI study, nor on the NBI study itself. DOE is aware of the NBI study, associated criticism, and of Dr. Scofield's analysis.**

**DOE notes that the study concerned a fraction of buildings and the application of a past version of LEED-NC. DOE considers these analyses highly relevant to our deliberations on the identification of a green building rating system as directed by Congress in §433 of the Energy Independence and Security Act (EISA) of 2007, and as advised by the General Services Administration under §436(h) of EISA.**

**DOE also notes that the National Research Council (NRC) on behalf of the Department of Defense is in the process of conducting an analysis on the cost effectiveness of LEED as applied to military installations, which Congress mandated in the National Defense Authorization Act for Fiscal Year 2012. Pub. L. No. 112-81., §2830 (a)(2). Upon its release, DOE will review and consider the NRC analysis, along with other available analyses and studies.**



**Department of Energy**  
Washington, DC 20585

November 6, 2012

The Honorable Ralph Hall  
Chairman  
Committee on Science, Space, and Technology  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On February 8, 2012, Peter Lyons, Assistant Secretary for Nuclear Energy, testified at a hearing entitled: *Assessing America's Nuclear Future – A Review of the Blue Ribbon Commission's Report to the Secretary of Energy*.

Enclosed are the answers to eight questions that were submitted by Representative Judy Biggert and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis", is positioned above the printed name.

Christopher E. Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Eddie Bernice Johnson, Ranking Member





## **QUESTION FROM REPRESENTATIVE JUDY BIGGERT**

**Q1. How does DOE plan to prioritize its nuclear energy research activities in light of the BRC findings? What nuclear energy research and development programs will receive lesser emphasis in order to provide sufficient resources to BRC-recommended activities, such as the Used Nuclear Fuel Disposition Campaign?**

**A1. To ensure that nuclear power continues to be a safe, reliable resource for our nation's long-term energy supply and security, the United States must put in place a sustainable fuel cycle and used fuel management strategy. To advise the Administration, Secretary Chu convened the Blue Ribbon Commission on America's Nuclear Future (BRC). This expert panel completed their final report and recommendations in January of 2012. The Administration is giving full consideration to the BRC recommendations as we work to define a path forward. The Administration anticipates providing some additional information on that work later this year, and will work with Congress to implement a new strategy to manage our nation's used nuclear fuel and nuclear waste. Decisions about future prioritization of funding will be made through the standard planning and budgeting processes.**

**Funding for the Used Nuclear Fuel Disposition subprogram increased from \$32.5 million in FY 2011 to \$59.7 million in both FY 2012 Enacted and the FY 2013 Request. This increase was offset in FY 2012 in the Fuel Cycle Research and Development program by reducing or eliminating funding for activities that could be combined and/or streamlined, such as the Modeling and Simulation subprogram and the Transmutation Research and Development subprogram. Modeling and Simulation activities were consolidated in NE's Nuclear Energy Enabling Technologies program and focused on activities related to fuels**

development. Transmutation Research and Development was consolidated in FCR&D's Advanced Fuels subprogram and focused on activities supporting nuclear data development for fuels design.

The mission of FCR&D continues to be both: (1) develop used nuclear fuel management strategies and technologies to support meeting federal government responsibility to manage and dispose of the nation's commercial used nuclear fuel and high-level waste, and (2) develop sustainable fuel cycle technologies and options that could economically improve resource utilization and energy generation, reduce waste generation, enhance safety, while limiting proliferation risk.

FCR&D funding in FY 2012 Enacted and the FY 2013 Budget Request continue to support both parts of the mission. Near-term program objectives outside the Used Nuclear Fuel Disposition subprogram that continue to be supported are:

- Identify and test options to potentially increase accident tolerance of light water reactor fuel.
- Select preferred sustainable fuel cycle options for further development.

Some long-term research and development on advanced fuel cycles is being refocused to the high-priority issue areas of used nuclear fuel disposition activities and research and development into accident tolerant fuels in response to Fukushima. This includes separate effects testing and advanced characterization of nitride and mixed oxide ceramic fuel. In addition, feasibility studies of fast reactor fuel will be delayed.

**QUESTION FROM REPRESENTATIVE JUDY BIGGERT**

- 2. What research activities do you think the Nuclear Waste Fund could be used for? For example, could the Fund be used to build the suggested co-located R&D lab?**

**A2: The Nuclear Waste Fund could be used to fund any research activities under titles I and II of the Nuclear Waste Policy Act that are needed to support DOE's commitment to meeting its obligation to dispose of used fuel and high-level radioactive waste. Examples of such activities include certain storage and transportation activities as laid out in the FY13 Budget.**

#### QUESTION FROM CHAIRMAN RALPH HALL

- Q1. What would the impact on DOE sites that are currently storing radioactive waste, such as Hanford, the Savannah River Site, and Idaho National Laboratory, be if an entirely new search for a nuclear waste repository is initiated? Can you estimate how long these communities would have to continue storing radioactive waste, and how long they would have to wait for more permanent solutions?**
- A1. There is no near term impact to the DOE sites. Currently, the Department is working to treat and package the defense related HLW and SNF at its sites for continued safe interim storage and future disposal. These activities are expected to continue for several decades. While interim storage can continue safely onsite for 50 years or longer, permanent disposition is ultimately needed for the Department to complete site cleanup activities and fulfill regulatory commitments.**

## QUESTION FROM CHAIRMAN RALPH HALL

- Q2. Nuclear waste is produced as a result of a commercial activity. The private sector is responsible for fueling and operating reactors, which has been very successful. The federal government is responsible for the disposal and storage of nuclear waste, but has encountered major challenges. Further, federal responsibility for waste creates billions of dollars in taxpayer liability when the government does not meet its legal obligations.**

**Given the track record of the current system, would shifting the responsibility for nuclear waste management to the commercial sector and providing a strong and predictable regulatory framework serve as a more functional structure to address this issue?**

- A2. To ensure that nuclear power continues to be a safe, reliable resource for our nation's long-term energy supply and security, the United States must put in place a sustainable fuel cycle and used fuel management strategy. To advise the Administration, Secretary Chu convened the Blue Ribbon Commission on America's Nuclear Future (BRC). This expert panel completed their final report and recommendations in January of 2012. The Administration is giving full consideration to the BRC recommendations as we work to define a path forward. The Administration anticipated providing some additional information later this year, and will work with Congress to implement a new strategy to manage our nation's used nuclear fuel and nuclear waste.**

**QUESTION FROM CHAIRMAN RALPH HALL**

**Q3. Could a consolidated interim storage facility be developed as a private, NRC licensed facility? If so, how should DOE be directed to work with such a facility to assure its viability?**

**A3. Yes, under current law it could. The Private Fuel Storage facility in Utah was licensed by the Nuclear Regulatory Commission. In that case, the owner/applicant did not request assistance from DOE to assure its viability. It is not clear that there would need to be any involvement by DOE to ensure the viability of any private facility.**

## QUESTION FROM CHAIRMAN RALPH HALL

**Q4. Please describe the primary advantages and disadvantages associated with mined geological repositories compared to the deep borehole method of disposal.**

- a. Please provide a detailed description of research, development, and demonstration needs associated with deep boreholes, and a list of corresponding activities that DOE intends to pursue in the current and next two fiscal years.**
- b. The Nuclear Waste Policy Act requires that high-level waste be retrievable after storage. Does the deep borehole method of disposal for nuclear waste meet that requirement? If not, do you think the Nuclear Waste Policy Act should be amended to permit permanent non-retrievable disposal.**

**A4. The main difference between mined geological repositories and deep borehole disposal is that in a mined geological repository, waste is emplaced in a series of excavated drifts or rooms, characteristically a few hundred meters below the earth's surface. In the deep borehole disposal method, waste is emplaced in individual boreholes deep within the crystalline basement rock, typically between 3000 and 5000 meters below the earth's surface. There are potential advantages and disadvantages to both designs. Some of the primary advantages and disadvantages include:**

**The technology readiness level of mined geological repositories is currently much further advanced than the technology readiness level for deep borehole disposal. Disposal in deep boreholes has never been demonstrated, and there is no licensing experience with deep borehole disposal. Whereas, in the United States, the Waste Isolation Pilot Plant a geological repository in salt for defense transuranic waste has been in operation for years.**

Internationally, most countries with radioactive waste disposal programs are pursuing some form of mined geological repository for disposal.

Mined geological repositories are more flexible than deep borehole disposal. Depending on the specific geologic media and repository design, mined repositories can accommodate a wider variety of waste types and larger size of waste packages. Due to current drilling technologies, waste packages disposed of in deep boreholes would be limited to about two feet in diameter. This would restrict the types of waste that could be disposed of in deep boreholes, or require some type of waste consolidation or waste processing to accommodate additional waste types. Mined repositories also lend themselves much better to retrievability of the wastes than deep borehole disposal.

Some potential advantages of deep borehole disposal are that the waste disposal depth provides a larger separation and potentially less interaction between the disposal zone and the surface environment and shallow groundwater. The deep borehole disposal concept is modular and could be deployed at multiple locations. Crystalline basement rock is relatively common at depths of 2 to 5 kilometers which could allow for geographical distribution of disposal sites if desired. Multiple disposal locations could reduce the distance of shipments and costs of transportation of wastes to the disposal sites. The difficulty of retrievability could also be considered a potential advantage for those wastes which have no possible future use, but could be a disadvantage if retrieval was warranted for protection of public health and safety, or the environment. Overall, the anticipated cost of deep borehole disposal is potentially less than that of a mined repository.



More detailed information on deep borehole disposal can be found in the *Reference Design and Operations for Deep Borehole Disposal of High-Level Radioactive Waste*, SANDIA REPORT SAND2011-6749, Arnold, B. W., P. V. Brady, et al. (2011).

- A4a. Deep borehole disposal is still in the conceptual stage. In FY12, the Department is preparing a Deep Borehole Research, Development & Demonstration Plan. Activities to be undertaken will be determined on an annual basis as part of the standard planning and budget development processes, the types of activities that could potentially be examined include:

Research activities designed to better understand the hydrogeochemical and geophysical state of deep crystalline rocks. Collaboration with industry partners on engineering analyses for site/surface operations, emplacement, seal design and the potential and cost of retrievability. Identification and development of characterization activities that are necessary to demonstrate the safety and meet regulatory requirements for the deep borehole disposal concept demonstration.

- A4b. Retrieval of waste disposed of in deep boreholes, although possible, would likely be very difficult. Although disposal in deep boreholes would likely be better suited to wastes that are not expected to have any potential value or use in the future, the option for retrieval would still need to be considered if necessary to protect public health and safety, or the environment. As to whether the NWPA should be amended to allow permanent non-retrievable disposal, that issue among many others would have to be considered as the

**Administration develops its strategy and works with Congress to implement a new strategy to manage our nation's used nuclear fuel and nuclear waste. The Department is committed to collaborating with Congress and stakeholders to find a safe and long-term solution to managing our nation's used nuclear fuel.**

## **QUESTION FROM CHAIRMAN RALPH HALL**

- Q5. The transportation recommendations include several R&D components. How much funding does DOE anticipate will be needed to address R&D associated with transportation issues?**
- a. Please provide a detailed description of research, development, and demonstration needs associated with transporting high-level radioactive waste, and a list of corresponding activities that DOE intends to pursue in the current and next two fiscal years.**
- A5. The Department of Energy considers the activities related to transportation and storage to be closely related. Therefore the funding for these activities is grouped together. The R&D funding at national laboratories associated with the storage and transportation activities in FY12 is approximately \$8 million. This bundle of activities is funded at \$9 million in the FY13 Budget. Future activities and funding requirements will be determined through the standard program planning and budget development processes.**

**Some of the specific FY12 and FY13 activities at the national laboratories include:**

- Initiate system analyses for including initial consolidated interim storage, use of standardized canisters, and improving efficiency of transportation.**
- Conduct R&D on extended storage of used fuel including assessing issues related to the aging and safety of dry and wet storage and materials testing in support of modeling and simulation.**
- Conduct R&D on transportation of used fuel following extended storage, particularly related to high burn up fuel.**

**In FY2012, in addition to the work at the national laboratories, the DOE is beginning work with private industry on issues related to transporting and storing used nuclear fuel.**

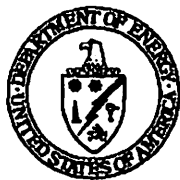
**Approximately \$12 million dollars is allocated, and includes the following activities:**

- **Materials Degradation - Work with the utilities to instrument storage casks to monitor and understand their behavior with time.**
- **Standardized Cask Systems – Analyses to examine tradeoffs associated with future implementation of standardized storage systems.**

#### QUESTION FROM CHAIRMAN RALPH HALL

- Q6. The Department of Energy's FY 13 budget proposal requests \$10 million from the Nuclear Waste Fund to "support recommended activities, consistent with the Nuclear Waste Policy Act." Please provide a detailed description of how DOE intends to spend this requested funding.**
- A6. Consistent with the Blue Ribbon Commission recommendation to promote the better integration of storage into the waste management system, including standardization of dry cask storage, DOE intends to utilize some of the requested \$10 million funding from the Nuclear Waste Fund to develop standardized container specifications with industry and award contracts to vendors to design standardized containers. The Nuclear Waste Fund could be used to fund any activities under titles I and II of the Nuclear Waste Policy Act that are needed to support DOE's commitment to meeting its obligation to dispose of used fuel and high-level radioactive waste.**

**DOE intends to utilize the remainder of the requested \$10 million from the Nuclear Waste Fund to finalize transportation procedures for technical assistance consistent with NWPA section 180 (c), will initiate pilot training programs for emergency responders along those routes from decommissioned sites if appropriate, and to expand interaction with Transportation Stakeholders consistent with Blue Ribbon Commission recommendations.**



**Department of Energy**  
Washington, DC 20585

November 26, 2012

The Honorable Andy Harris, M.D.  
Chairman  
Subcommittee on Energy and Environment  
Committee on Science, Space, and Technology  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On July 26, 2012, Dr. Kathleen Hogan, Deputy Assistant Secretary for Energy Efficiency, Office of Energy Efficiency and Renewable Energy, testified to examine the Department of Energy's (DOE) Vehicle Technologies Program, specifically management and oversight of DOE's alternative vehicle research, development, demonstration, and commercialization activities.

Enclosed are the answers to six questions that were submitted by Congressman Neugebauer and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in cursive script, reading "Christopher E. Davis", is positioned above the printed name.

Christopher E. Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Brad Miller, Ranking Member



# **QUESTION FROM CONGRESSMAN ANDY HARRIS**

**Q1. Please give a detailed description of DOE's cost-sharing arrangement for both The EV Project and ChargePoint America Project. Include as part of this relevant paperwork or documents that guide cost-sharing decision-making and approval processes.**

**A1. Cost share is required for most financial assistance awards under 10 CFR 600.30 (Cost Sharing) and EPCAct 2005 section 988 (Cost Sharing). The minimum cost share required for the EV Project and ChargePoint America Project is 50 percent and comes in the form of cash from third parties and a variety of in-kind sources as shown in the table below.**

In both cases, the awardee is using funds (cash) from grants at the state level. Third-party in-kind cost share comes in the form of hardware to support project activities, labor and expertise, and fixed costs for equipment usage related to data collection. The Department carefully reviews cost share to ensure compliance with cost share principles established in 10 CFR 600.313 (Cost Sharing or Matching) and 10 CFR 600.317 (Allowable Costs). Initial cost share commitment letters for both ETEC/ECOTality will be provided under separate cover.

<b>Cost Share</b>	<b>Source</b>	<b>Type</b>	<b>Amount of Cost Share</b>
<b>ETEC/ECOTality</b>			
Cash	Recipient: ETEC	Recipient funds	\$14,306,636
Cash	Third Party: Bay Area AQMD Grant	Grant	\$1,050,000
Cash	Third Party: California Energy Commission (CEC) Grant	Grant	\$8,000,000
In-kind	Third Party: Qualcomm	Hardware (modems) for charge stations	\$103,500
In-kind	Third Party: Underwriter's Laboratories (UL)	Labor and testing	\$169,000
In-kind	Third Party: University of California, Davis	Labor (data analysis)	\$200,000

In-kind	Third Party: Residence Owner	Installation costs for charge stations paid by host	\$968,326
In-kind	Third Party: Vehicle owner	Fixed vehicle usage cost for the deployed vehicles for the course of the project	\$67,063,692
In-kind	Third Party: Residence Owner	Internet connection cost (fixed) for residential locations to transmit data	\$1,949,130
In-kind	Third Party: Commercial Host	Internet connection cost (fixed) for commercial locations to transmit data	\$130,836
In-kind	Third Party: Commercial Host	Cost for parking space per commercial charge station (fixed cost)	\$15,408,686
In-kind	Third Party: Commercial Host	Cost for parking space per DC fast charge station (fixed)	\$1,153,902
Cash	Third Party: Partners on the Oak Ridge National Laboratory component of the project	Cash	\$2,750,000
In-kind	Third Party: Partners on the Oak Ridge National Laboratory component of the project	Labor and hardware	\$1,700,000
<b>Coulomb</b>			
Cash	Recipient: Coulomb	Recipient funds	\$3,114,934
Cash	Third Party: California Energy Commission (CEC) Grant	Grant	\$800,000
In-kind	Third Party: Residence Owner	Installation costs for charge stations paid by host	\$6,478,751
In-kind	Third Party: Vehicle owner	Fixed vehicle usage cost for the deployed vehicles during the project	\$4,708,700



### QUESTION FROM CONGRESSMAN ANDY HARRIS

**Q1.** Please give a detailed description of DOE's cost-sharing arrangement for both The EV Project and ChargePoint America Project. Include as part of this relevant paperwork or documents that guide cost-sharing decision-making and approval processes. Additionally, please answer the following questions:

**a.** What is the project's overall non-Federal cost-share, and how much of the cost-share is met through in-kind vs. cash contributions? Please describe the type and source of these contributions.

**A1a.** As shown in the table provided in the response to question 1, the total non-Federal cost share for The EV Project (ETEC/ECotality North America, project DE-EE0002194) is \$114,803,708; \$91,447,072 of the cost share comes from in-kind sources, as allowable.

As shown in the table below, the total non-Federal cost share for the Coulomb Technologies project (DE-EE0003391) is \$15,102,385; \$11,187,451 of the cost share comes from in-kind sources, as allowable.

<b>Nature/Description of Cost Share</b>	<b>Source</b>	<b>Type</b>	<b>Amount of Cost Share</b>
Cash	Recipient: Coulomb	Recipient funds	\$3,114,934
Cash	Third Party: California Energy Commission (CEC) Grant	Grant	\$800,000
In-kind	Third Party: Residence Owner	Installation costs for charge stations paid by host	\$6,478,751
In-kind	Third Party: Vehicle owner	Fixed vehicle usage cost for the deployed vehicles during the project	\$4,708,700

## QUESTION FROM CONGRESSMAN ANDY HARRIS

**Q1. Please give a detailed description of DOE's cost-sharing arrangement for both The EV Project and ChargePoint America Project. Include as part of this relevant paperwork or documents that guide cost-sharing decision-making and approval processes. Additionally, please answer the following questions:**

**b. What percentage of the project's cost-share is accounted for by the third-party vehicle purchases by individual consumers? How much revenue is generated by project-deployed commercial chargers, and what percentage of this revenue is included in project cost-sharing contributions?**

**A1b. The Department does not count vehicle purchase prices as cost-share for either the ETEC/ECotality or Coulomb projects. All cash and in-kind contributions meet the criteria set forth in 10 CFR 600.313 (Cost Sharing or Matching). These costs are allowable in accordance with 10 CFR 600.317 (Allowable Costs) and the Federal Acquisition Regulation (FAR), 48 CFR part 31 for for-profit organizations.**

**The majority of installed chargers are residential and do not generate revenue. The amount of revenue to be generated by the use of commercial chargers is unknown at this time. Currently, revenue generated from commercial charge stations is not counted as cost share and is considered ancillary to the project. However, there is a request pending from ECotality and under Department review to use this revenue as cost share. Revenue generated by project-deployed commercial charge stations is handled according to the Program Income clause in the award terms and conditions, as authorized in 10 CFR 600.314.**

## QUESTION FROM CONGRESSMAN ANDY HARRIS

- Q1. Please give a detailed description of DOE's cost-sharing arrangement for both The EV Project and ChargePoint America Project. Include as part of this relevant paperwork or documents that guide cost-sharing decision-making and approval processes. Additionally, please answer the following questions:
- c. The Transportation Electrification FOA stated that "If a third party, (i.e., a party other than the organization submitting the application) proposes to provide all or part of the required cost sharing, the applicant must include a letter from the third party stating that it is committed to providing a specific minimum dollar amount of cost sharing. The letter should also identify the proposed cost sharing along with the justification for proposing less than 50% cost share (e.g., cash, services, and/or property) to be contributed." Please provide a detailed description of all third-party cost sharing in each project, and how DOE has implemented the above FOA requirement with respect to such cost sharing.
- A1c. As shown in the table provided in the response to question 1, both projects are using a combination of cash and in-kind contributions from third parties to meet cost-share requirements.

Both ETEC/ECOtality and Coulomb provided the appropriate cost share commitment letters with their applications to the Transportation Electrification funding opportunity, in accordance with the requirements stated in the funding opportunity announcement.

Letters will be provided to the Committee under separate cover. In addition, as these projects progress, DOE carefully reviews all invoices, which include cost share, to ensure it is documented properly and meets project cost share requirements.

QUESTION FROM CONGRESSMAN ANDY HARRIS

- Q2. According to SEC filings, in January 2012, DOE notified ECotality that it was “proceeding with the definitization process and advised the Company verbally that a change will be made to disallow reimbursement of certain in-kind costs.”<sup>1</sup> The change in policy required ECotality to adjust its methodology to allocate cost share, and “exclude the in-kind costs no longer allowed for reimbursement.” What specific in-kind costs were no longer allowed as part of this change by DOE? Please provide a copy of the notification DOE provided to ECotality regarding this change.
- A2. The Department disallowed in-kind costs for vehicle operating costs per mile and vehicle insurance and licensing costs. The notification provided to ECotality will be provided to the Committee under separate cover.

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<sup>1</sup> SEC ECotality Form 10-K, April 16-2012.

### QUESTION FROM CONGRESSMAN ANDY HARRIS

**Q3.** A letter contract award for The EV Project was signed on September 30, 2009, which was to be followed by project “definitization,” which would detail allowable spending, cost-sharing, and other award implementation details. As of the date of the June 26, 2012 hearing, DOE had still not finalized (i.e. “definitized”) The EV Project, even though amendment nine of the project has now authorized spending of up to \$70 million on the project, compared to the \$500, 000 originally provided to be spent in advance of project definitization.

**a.** What is the reason for this delay? How common is this problem? How many other current multi-million grants within EERE have proceeded more than two years without definitization? What guides spending decisions in the absence of project definitization?

**A3a.** The timeline for definitization of this particular award is not typical. Delays in Defense Contract Audit Agency audits, 10 CFR 600.316 Audits, and evolving cost share scenarios affected the timeline for this particular project. In order to proceed with the project, DOE worked with ECOtality to determine incremental tasks for near-term completion that would enable the project to proceed, minimizing the risk to taxpayer dollars while the project was completing definitization. The award to ECOtality completed definitization on August 31, 2012.

## QUESTION FROM CONGRESSMAN ANDY HARRIS

- Q4. A 2011 SEC filing by ECotality noted that The EV Project was supporting R&D expenditures to develop EV charging infrastructure hardware and software, stating:

We devoted a large percentage of our 2011 R&D expenditures to the creation of the Blink Level 2 Chargers, Blink DC Fast Chargers and supporting internal software platforms and network. These expenditures were accomplished primarily in house with some hardware and other features undertaken by supplier companies and *was supported in large part through The EV Project.*"<sup>2</sup>(Emphasis Added).

In correspondence to the Subcommittee, ECotality state the "[t]he 2011 filing refers to development work that ECotality undertook specifically to accommodate the unique data collection requirements of The EV Project objectives." However, the Project's award agreement documents – which include a detailed project scope and description of specific tasks to be performed – do not discuss the creation of new chargers and their supporting platforms as part of the project.

EV project sub-award information available on Recovery.gov provides further detail on Project spending on new product development, with at least 15 sub-awards totaling several million dollars described as going toward product "design," "development," and "engineering." (See Appendix A.)

- a. How much EV Project spending has gone toward the development of new charging products? How much of this spending was for chargers and charging systems already commercially available in the marketplace?

- A4a. At the time of the award, there was no commercially-available electric vehicle supply equipment that met the project requirements. The Department approved some research and development (R&D) activity as part of the ECotality project in order to ensure the availability of hardware and software that met project needs. The R&D portion of the total budget is \$10.7 million.

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<sup>2</sup> SEC, "ECotality, Inc, Form 10-K," April 16, 2012.

## QUESTION FROM CONGRESSMAN ANDY HARRIS

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- b. Why wasn't development of new charging products such as DC fast chargers described in the EV Project Assistance Agreement scope or tasks to be performed?
- A4b. Development of a Level 3 charger (i.e. DC Fast Charger) is authorized in the Statement of Project Objectives, Subtask 3.3.3.

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<sup>3</sup> SEC, "ECOTality, Inc, Form 10-K," April 16, 2012.

## QUESTION FROM CONGRESSMAN ANDY HARRIS

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- c. Was a change in scope regarding new product development proposed and agreed to by DOE's contracting officer, as required in the assistance agreement reporting requirements?
- A4c. A change in scope was not required—development of the charger was part of ECotality's original budget submission as well as the original Statement of Project Objectives that was approved by the Department's contracting officer at the time of award.

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<sup>4</sup> SEC, "ECotality, Inc, Form 10-K," April 16, 2012.



## QUESTION FROM CONGRESSMAN ANDY HARRIS

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In correspondence to the Subcommittee, ECOtality state the “[t]he 2011 filing refers to development work that ECOtality undertook specifically to accommodate the unique data collection requirements of The EV Project objectives.” However, the Project’s award agreement documents – which include a detailed project scope and description of specific tasks to be performed – do not discuss the creation of new chargers and their supporting platforms as part of the project.

EV project sub-award information available on Recovery.gov provides further detail on Project spending on new product development, with at least 15 sub-awards totaling several million dollars described as going toward product “design,” “development,” and “engineering.” (See Appendix A.)

- d. What is DOE’s response to concerns that taxpayer spending on the creation of EV charging systems advantages certain companies over others given the highly competitive nature of the EV charging marketplace?

- A4d. It is important to recognize that this project is primarily a demonstration and evaluation activity and is not intended as a comprehensive deployment of charging infrastructure. The primary purpose of the project is a data collection effort to provide an extensive, publicly-available data set with information about electric vehicle (EV) charging. Data gathered from the project is and will continue to be available to communities planning for future infrastructure investments as well as the industry and other entities. Like all applicants for grant funding, the Department selected the project on the merits through an open and competitive process after applying the rigorous review procedures conducted by the Department’s professional staff and outside consultants.

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<sup>5</sup> SEC, “ECOtality, Inc, Form 10-K,” April 16, 2012.

**QUESTION FROM CONGRESSMAN ANDY HARRIS**

- Q5. Amendment 007 to The EV Project's assistance agreement changed the sponsoring DOE office for the Project from the National Energy Technology Laboratory (NETL) to DOE's Office of Energy Efficiency and Renewable Energy (EERE). Please explain why the sponsoring office changed from NETL to EERE.**
- A5. The change was performed as part of overall policy guidance from the Department's Office of Energy Efficiency and Renewable Energy (EERE) to the National Energy Technology Laboratory (NETL). The change clarified that NETL is the agreement manager and not the sponsor; EERE has always been the sponsor.**

## QUESTION FROM CONGRESSMAN NEUGEBAUER

- Q1.** I would like to better understand the business models for the EV charging companies. Recently, the House Committee on Administration passed legislation directing the Architect of the Capitol to install charging stations in our garage parking lots. The legislation would incur no cost to the taxpayer – the cost of charger installation would be paid for by fees billed to those who use the chargers.

Are any charging companies using this business model anywhere in the country, where they pay for initial installation and then recoup costs through charging fees? Why won't this business model work across the country, and wouldn't it be preferable to massive taxpayer subsidization of these charging stations?

- A1.** As plug-in vehicles continue to enter the market and the need for charging infrastructure increases, a variety of business models are emerging in the EV charging sector. The goal of the Department of Energy's Transportation Electrification demonstration projects is not intended to deploy electric charging infrastructure but rather to provide a first-of-a-kind comprehensive data set with information about electric vehicle (EV) charging. This data set is and will be available to help communities and industry plan for future infrastructure rollouts and inform business model development. Aside from this demonstration activity, there is no Federal subsidy for electric charging infrastructure.



## Department of Energy

Washington, DC 20585

November 29, 2012

The Honorable Ed Whitfield  
Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On November 9, 2012, we sent you the edited transcript of the July 17, 2012, testimony given by Dr. Kathleen Hogan, Deputy Assistant Secretary for Energy Efficiency, Office of Energy Efficiency and Renewable Energy, regarding "The American Energy Initiative."

Enclosed are 3 inserts that were requested by Representatives Barton and Burgess for the hearing record.

Also enclosed is the answer to a question that was submitted by Representative Olson to complete the hearing record for Dr. Hogan.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink that reads "Christopher Davis".

Christopher Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental  
Affairs

Enclosures

cc: The Honorable Bobby L. Rush, Ranking Member



of the RFS, which is over some period of time. And if you do look at the fuels that the RFS is promoting, clearly one of the things you are looking to do is to address carbon.

There has certainly been a number of studies that have been brought forward on the carbon profile of ethanol. I think the most recent set of studies actually show about a 20 percent benefit from ethanol. And then what I mostly talked about in my statement was not corn-based ethanol but really cellulosic based ethanol which really gets you a very, very, very substantial carbon benefit. And certainly we can have a conversation of the multiple objectives we are trying to advance in this country. But as I understand the RFS, it was mostly, it was for carbon as well as oil imports and it is delivering on that. And as we look at the growing, I guess, requirements for cellulosic based ethanol we would see even greater benefits going forward.

Mr. Barton. Well, my time is about to expire, but the statistic that I have in front of me is that ethanol contains only 61 percent of the energy of gasoline. It takes 1.64 gallons of ethanol to do the same amount of work as a gallon of gasoline. That 1.64 gallons of ethanol emits 20.5 pounds of CO<sub>2</sub>. Ethanol emits 1 pound more of CO<sub>2</sub> in the air than using a gallon of gasoline. Now, I don't know if that is a correct statement, but that is what my staff has prepared. Do you agree with that?

Ms. Hogan. We can certainly share with you our calculations. I do know that the studies that we are engaged with take into account the energy value of ethanol versus the energy value of a gallon of gasoline, and we are happy to share our numbers with you.

COMMITTEE: HOUSE ENERGY AND COMMERCE  
SUBCOMMITTEE ON ENERGY & POWER  
HEARING DATE: JULY 17, 2012  
WITNESS: KATHLEEN HOGAN  
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INSERT FOR THE RECORD

The greenhouse gas (GHG) emissions of biofuels relative to conventional fuels are most appropriately compared on a full lifecycle basis, accounting for all stages of the fuel production process. Biofuels must be credited with all of the carbon dioxide captured and stored as the biomass grows—as well as any emissions during harvest, conversion, distribution, and use. The GREET (Greenhouse gases, Regulated Emissions, and Energy use in Transportation) model developed at Argonne National Laboratory has been used extensively to examine GHG emissions of vehicle technologies and transportation fuels on a consistent basis. Published GREET results estimate that today's U.S. corn ethanol, on average, results in a lifecycle reduction in GHG emissions of 24% relative to the emissions associated with gasoline.<sup>1</sup> Cellulosic ethanol has the potential to reduce GHG emissions significantly further, up to 80-100%.<sup>2,3</sup> These analyses calculate GHG emissions per unit of energy produced, rather than per gallon, to account for the different energy content of fuels.

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<sup>1</sup> Wang MQ, Han J, Haq Z, Tyner WE, Wu M, Elgowainy A. Energy and greenhouse gas emission effects of corn and cellulosic ethanol with technology improvements and land use changes. *Biomass and Bioenergy* 2011; 35:1885–1896.

<sup>2</sup> Wang MQ, Han J, Haq Z, Tyner WE, Wu M, Elgowainy A. Energy and greenhouse gas emission effects of corn and cellulosic ethanol with technology improvements and land use changes. *Biomass and Bioenergy* 2011; 35:1885–1896.

<sup>3</sup> Scown C D, Nazaroof W W, Mishra U, Stroger B, Lobscheld A B, Masanet E, Santero N J, Horvath A and McKone T E 2012 Lifecycle greenhouse gas implications of US national scenarios for cellulosic ethanol production *Environ. Res. Lett.* 7 1–9.

of where we have gone, which is why, and I think, you know we have heard reference from Mr. Rush. This a tough summer. Grain production is way off. Why are we continuing to follow this foolhardy policy?

I mean, it was done under President Bush and I acknowledge that, but I think it is time to recognize the limitations of this and move away from what really is a, it is not, it is not a policy that follows commonsense.

Ms. Hogan, I just wanted to ask you a question. On your bio on the Web site, it talks that you were the, one of the principle overseers of \$16 billion in stimulus funding at EERE, is that correct?

Ms. Hogan. That is correct.

Dr. Burgess. And I know you wouldn't have it with you today, but can we ask you to provide the committee with some detail on how that money has been spent, how much is left, what it was spent for? You referenced in your testimony the new law with new batteries that are going to be produced. I am having difficulty trying to calculate the cost per battery. It looked high, but I want to be fair about it. So could you provide us the line item budgetary detail on that \$16.4 billion that your agency administered?

Ms. Hogan. We absolutely can provide you with that detail.

[The information follows:]

\*\*\*\*\* COMMITTEE INSERT \*\*\*\*\*

COMMITTEE: HOUSE ENERGY AND COMMERCE  
SUBCOMMITTEE ON ENERGY & POWER  
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Approximately \$1.5 billion of EERE-administered Recovery Act funds support the establishment of battery manufacturing plants, including pack assembly facilities, battery cell production plants, and battery materials production plants. As of November 5, 2012, \$1.02 billion has been spent supporting those projects. These facilities will be capable of supporting the production of up to 500,000 vehicle batteries each year once fully equipped. However, a one-to-one match of dollars per battery produced is not possible, as the cost to build the facilities will amortize over many years of plant operation. In addition, the cost to manufacture a battery is a combination of capital, labor, material, utilities, and other expenditures. As in businesses of all kinds, manufacturers consider the cost of manufacturing a technology or component to be highly proprietary. Since Recovery Act-funded battery manufacturing facilities are producing battery packs and cells of varying sizes for different vehicles, the Department's metrics for battery manufacturing capacity are based on an average 10 kWh plug-in hybrid battery.

The Department does have detailed, industry peer-reviewed cost models with which we evaluate technology status and progress toward cost-reduction targets. These models show that DOE-funded research has reduced the cost of lithium-ion batteries from \$1,000/kWh in 2008 to \$500/kWh today, and that we are on track to achieve our 2015 cost-reduction target of \$300/kWh, or about \$3,000 per 10 kWhr plug-in hybrid battery.



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**EERE ARRA Funding**  
As of July 17, 2012.

DOE Program Office Name	DOE Project Name	Total Awarded (in dollars)	Total Outlaid (in dollars)
Energy Efficiency and Renewable Energy	Advanced Building Systems	67,032,755	47,193,468
	Advanced Materials RD&D in Support of EERE Needs to Advance Clean Energy Technologies and Energy-Intensive Process R&D	46,694,635	40,971,279
	Battery and Electric Drive Component Manufacturing	1,989,972,847	1,271,801,517
	BetterBuildings: Buildings	62,000,000	45,072,491
	BetterBuildings: BECBG	390,040,000	224,960,084
	Buildings and Appliance Market Transformation	51,751,812	46,755,210
	Clean Cities AFV Grant Program	298,500,000	207,703,717
	Combined Heat and Power (CHP), District Energy Systems, Waste Heat Recovery Implementation and Deployment of Efficient Industrial Equipment	150,480,040	94,420,972
	Commercial Scale Biorefinery Projects	81,975,766	3,690,424
	Commercial Vehicle Integration (SuperTruck) and Advanced Combustion Engine R&D	106,055,410	51,358,127
	Community Renewable Energy Deployment	21,227,468	4,070,349
	Concentrating Solar Power	24,131,229	21,390,535
	EE Appliance Rebate Programs	296,588,437	296,158,171
	EE Conservation Block Grant Program	2,802,553,302	2,248,791,008
	EGS Technology R&D	111,882,191	87,901,734
	Enabling Fuel Cell Market Transformation	41,554,259	36,938,549
	Energy, Water & Emissions Reporting and Tracking System	5,472,389	5,467,973
	Enhance and Accelerate FEMP Service Functions to the Federal Government	16,142,768	16,076,572
	Fundamental Research in Key Program Areas	106,861,310	68,911,909
	Geothermal Demonstrations	58,079,566	9,364,633
	Ground Source Heat Pumps	62,448,081	36,260,843
	High-Penetration Solar Deployment	37,609,765	34,895,646
	Hydroelectric Facility Modernization Program	30,625,643	26,790,409
	Improved Energy Efficiency for Information and Communication Technology	47,017,414	44,906,791
	Industrial Assessment Centers and Plant Best Practices	9,530,613	9,412,086
	Integrated Biorefinery Research Expansion	13,432,500	13,295,010
	Investigation of intermediate ethanol blends, optimization of E-85 engines, and development of transportation infrastructure	19,793,138	19,358,039
	Lab Call for Facilities and Equipment	93,239,851	59,856,231
	Large Wind Turbine Blade Testing Facility	24,752,779	24,752,779

	Management and Oversight (EE Program Direction)	117,363,939	109,544,168
	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	509,154,294	315,420,118
	NREL Ingress/Egress Project	24,594,117	14,593,625
	NWTC Upgrades	33,650,313	15,291,298
	National Accounts Acceleration in Support of the Commercial Buildings Initiative	44,000,000	41,737,883
	National Geothermal Database, Resource Assessment and Classification System	9,950,000	9,451,663
	PV Systems Development	50,660,501	43,604,621
	Renewable Energy and Supporting Site Infrastructure	86,764,000	83,913,179
	Residential Buildings (Building America, Builders' Challenge, and Existing Home Retrofits)	23,633,230	22,579,323
	Solid State Lighting	46,168,404	38,890,632
	State Energy Program	3,084,474,000	2,797,189,287
	Transportation Electrification	386,232,871	207,967,299
	Validation of Innovative Exploration Technologies	84,469,202	36,096,380
	Weatherization Assistance Program	4,974,632,161	4,675,612,668
	Wind Energy Consortia between Institutions of Higher Learning and Industry	22,981,677	21,965,868
	Wind Energy Technology R&D and Testing	16,193,124	15,863,361
	Wind Turbine Drivetrain Testing Facility	44,555,002	38,238,558
<b>Energy Efficiency and Renewable Energy Total</b>		<b>\$16,626,922,803</b>	<b>\$13,586,486,487</b>

## QUESTION FROM CONGRESSMAN PETE OLSON

Q1. Given the abundance of viable fuel sources, has any consideration been given to moving away from the gallon mandate and moving toward an emission reduction level that would be would at least equal and maybe even exceed that achieved if ethanol was the only fuel, but at the same time help reduce dependence on imported oil?

a. If no consideration has been given, do you think there is merit to do so?

A1a. The Renewable Fuel Standard (RFS), established under the Energy Policy Act of 2005 (EPACT) and amended under the Energy Independence and Security Act of 2007 (EISA), sets aggressive goals for the use of renewable fuels. The RFS sets a goal for the use of 36 billion gallons of renewable fuels by 2022, of which 21 billion gallons will be advanced biofuels. Advanced biofuels are defined in the statute as renewable fuels, other than ethanol derived from corn starch, that reduce life-cycle GHG emissions by at least 50% compared to petroleum-based fuels. It is important to point out that the RFS does not set specific volume requirements for the use of ethanol; rather, it sets volume requirements for the use of qualifying renewable fuels, which in addition to ethanol, also include biodiesel, renewable diesel, and other hydrocarbon fuels that can be produced from algae, oil crops, and lignocellulosic material derived from agricultural waste, energy crops, and other types of biomass.

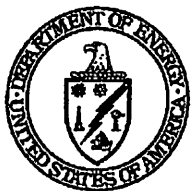
The EERE Biomass Program has not undertaken a specific analysis of an alternative fuel standard based solely on GHG emission reductions, rather than on the source of the biofuel, nor taken a policy position on the merits of such an approach.

## QUESTION FROM CONGRESSMAN PETE OLSON

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- b. If government's role is not to pick winners and losers, but to reach the 36 billion gallon mandate, shouldn't we also consider other fuels that are abundant – especially if these fuels, such as the conversion of natural gas into CNG/LNG, are as efficient and will reduce emissions as much as ethanol?

A1b. The Department agrees that a portfolio approach is important to reducing our dependence on oil and reducing carbon and other pollutant emissions. In addition to biofuels, it is investing in a wide variety of alternative fuel and advanced technologies to improve efficiency, including advanced combustion, electric drive, light-weight materials, hydrogen and fuel cells, and natural gas. The Department is also investing in the development of advanced lubricants and energy efficient tires, as well as idle reduction and other petroleum reduction strategies.



## Department of Energy

Washington, DC 20585

December 5, 2012

The Honorable Jeff Bingaman  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On May 17, 2012, Dr. Howard Gruenspecht, Deputy Administrator, Energy Information Administration, testified regarding "S 2146 The Clean Energy Standard Act of 2012."

Enclosed are eighteen answers to questions that were submitted by Ranking Member Murkowski, Senators Cantwell, Sanders, Manchin, and you for the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Brad Crowell", is written over a horizontal line.

Brad Crowell  
Principal Deputy Assistant Secretary  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Lisa Murkowski, Ranking Member



**SENR Hearing on CES, May 17, 2012**

**QUESTIONS FROM SENATOR BINGAMAN**

**Q1.** One notable change between the analysis EIA conducted for me during the development of this policy and the analysis of the introduced bill, is that CCS deployment dropped significantly between the two analyses, to the point that almost no CCS was projected to be deployed under S. 2146. CCS is a key clean technology that I would expect a policy like this to drive, so could you please comment on what changed between the analyses, and if it was driven by policy choices or changes in the modeling assumptions? Were there particular policy options in the first set of analyses that led to greater deployment of CCS?

**A1.** The initial cost assumptions for carbon capture and sequestration technologies were essentially unchanged from EIA's November 2011 CES analysis to our analysis of S. 2146. Differences among the various scenarios analyzed in the two reports are largely attributable to the differences in policy specification among these scenarios and changes in the reference cases used in the two reports. In general, scenarios with higher overall credit prices and more stringent targets tended to get more CCS built than scenarios, including S. 2146, with credit price caps, exemptions for small utilities, and other factors that reduced the effective compliance targets and have lower credit prices.

In addition, a number of relevant factors have changed in the Reference case of the November 2011 study relative to the Reference case of the S. 2146, including coal prices (up from 2011) and planned additions of demonstration CCS plants (down from 2011). In NEMS, the decrease in the number of demonstration plants results in higher ultimate costs for CCS due to foregone learning-by-doing.

In addition, the current analysis adopts and modifies various provisions examined in the 2011 analysis, such as alternative compliance payments, exclusion of existing nuclear and hydro generation, and small utility exemptions. For example, in the previous analysis, the impact on CCS builds and retrofits ranged from zero builds in the case with a small utility exemption case to almost 100 GW of new and retrofitted capacity in the case where existing nuclear and hydro generation was excluded from the sales baseline. The current proposal also adopts a significantly different trajectory for the targeted clean energy. Because these provisions may affect CCS builds in opposite directions, it is not clear that the CCS builds in the current results would necessarily match any particular case from the 2011 analysis.

- Q2.** DOE's testimony indicated that in 2035 under the CES, per-household electricity bills would still be about 5 dollars per month lower than they are currently. Is that projection consistent with your analysis of S. 2146?
- A2.** In the written testimony of Assistant Secretary Sandalow, the five dollar per household per month figure – actually \$5.45 per household per month – is correctly attributed to residential energy expenditures, not just residential electricity expenditures. For just electricity, households would pay an additional \$1.40 per month more than they did in 2011.

Total residential energy expenditures are projected to be less than 2011 residential expenditures estimated by EIA for several reasons. EIA projects continued improvement in the efficiency of household appliances over time, which causes per household residential energy expenditures to decline even in the reference case; in response to higher energy prices, adoption of efficient appliances is projected to increase, and

consumers will consume less energy overall; and average U.S. household size is projected to decline through 2035.



## QUESTIONS FROM SENATOR MURKOWSKI

**Q1.** In conducting your analysis of the Bingaman CES bill, EIA assumes that biomass generation is carbon-neutral and thus awards biomass a full credit. Consequently, biomass appears to do very well under a CES program, exceeding the reference case by 39 percent in 2025 and by 44 percent in 2035 and is needed to contain near-term prices. However, doesn't the bill direct the National Academy of Sciences (NAS) to undertake a study to determine the carbon intensity of biomass? The NAS study then, and the Department's dependent regulations, may result in some biomass facilities earning a less-than-full CES credit for their generation correct? What impact would a partial CES credit for biomass have on EIA's estimated resource mix and on consumer prices?

**A1.** Yes, as noted in EIA's report, the actual crediting of biomass generation will depend on the results of the NAS study and the subsequent rulemaking by the Secretary of Energy. Absent a ruling from the Secretary or the results of the NAS study, EIA assumed that biomass would earn a full credit for each MWh of generation. This assumption is consistent with prior EIA reports and analysis that assumes biomass to be a net-zero carbon resource. Sensitivity analysis of scenarios with a half or zero credit for biomass indicate that biomass-based compliance would shift to natural gas and other renewable resources, with little impact on credit prices. Residential electricity prices would rise by less than five percent in 2035 compared to the reported scenario with full crediting of biomass.

Although many agree that the use of sustainable biomass fuels should result in net zero carbon emissions over a long period of time, there is disagreement about the impact and importance of near-term carbon emissions from these resources. Differences in potential accounting may depend on the specific source of the biomass, the system implemented for harvesting and replanting the biomass, and the technology used to convert the

biomass to useful energy. Currently, EIA assumes that biomass used for electricity generation will come from urban wood wastes, mill residues, forestry residue, agricultural residues, and from short-rotation crops planted specifically for energy use.

From a carbon cycle perspective, it is important to note that the sources modeled by EIA in this analysis are largely waste products from other activities that are expected to continue harvesting biomass irrespective of the use of their waste or residue products for energy. The carbon cycle for short-rotation energy crops implies a “carbon recovery” period substantially within the time horizon of the analysis.

- Q2.** The EIA analysis of S. 2146 projects average regional delivered electricity prices to increase dramatically in several regions. According to EIA, the following five regions will experience a price jump of over 40 percent: (Midwest Reliability Organization / East (MROE), Midwest Reliability Organization / West (MROW), SERC / Gateway (SRGW), Southwest Power Pool / South (SPSO), WECC / Rockies (RMPA)). How does this 40 percent increase pass through to a family’s electric bill?
- A2.** EIA’s published BCES12 analysis includes electric power price projections by year, by sector, and by sensitivity analysis, for 22 regions in the continental United States. The price differences described in this Question refer to a percentage difference in projected 2035 prices, between the Reference case results and an offline estimate based on BCES12 policy case results. EIA performed this secondary analysis to estimate the range of price effects *within* a region, based on whether the power provider was covered by the BCES12 policy, or exempt from complying with the BCES12 requirements. Covered power providers will have compliance costs and therefore their customers will pay higher prices than customers of exempt power providers.

Relative to the Reference case, 2035 estimated average electricity prices for *covered* power providers in the BCES12 range from a low of 4% in WECC / California (CAMX) to a high of 49% in the SERC-Gateway (SRGW) region. For *exempt* power providers, estimated average 2035 electricity prices are lower than 2035 Reference case prices, with the exception of the New York – Upstate (NYUP) region.

Increases in electricity prices flow through to a household's electric bill. An average residential electricity expenditure number can be calculated by multiplying the average price times the average consumption. Under the BCES12 scenario, increases in the estimated national average 2035 household electricity expenditure is moderated by a decrease in projected consumption, by about 10% from 2010, at the household level. EIA projects continued improvement in the efficiency of household appliances over time, which causes the per-household residential electricity consumption to decrease even in the AEO2012 Reference case. In response to higher electricity prices in the BCES12 scenario, the adoption of efficient equipment is projected to increase leading to additional reductions in electricity use. Finally, the average U.S. household size is projected to decline through 2035.

- Q3.** Dr. Gruenspecht, under EIA's analysis of the CES, you determined that only 4 GW of additional hydropower capacity would be realized by 2035. What costs and resource information went into these particular National Energy Modeling System runs? Does your analysis include new resource assessments out of the DOE Energy Efficiency and Renewable Energy program, Federal Energy Regulatory Commission licensing and permitting applications, and other recent hydropower industry reports – all of which indicate a much higher potential than the EIA analysis.

A3. EIA has developed its database of hydropower potential from the 2003 report from Idaho National Engineering and Environmental Laboratory (INEEL) Estimation of Economic Parameters of U.S. Hydropower Resources (see [http://hydropower.inel.gov/resourceassessment/pdfs/project\\_report-final\\_with\\_disclaimer-3jul03.pdf](http://hydropower.inel.gov/resourceassessment/pdfs/project_report-final_with_disclaimer-3jul03.pdf)). Data from this report was further refined to better represent potential plant performance and to eliminate plants that fall outside of acceptable economic performance criteria. EIA is currently exploring options for updating hydro supply data based on more recent work from DOE and INEEL. The INEEL data that EIA currently uses to estimate hydropower capacity potential includes over 2,000 sites representing over 43,000 MW of potential capacity. This includes sites with existing powered dams that can add new generating units, existing dams without generating units that were built to accommodate them, existing dams without power and with no existing accommodation for generation, and sites without dams or other diversionary structures. While some of these sites are found to be economical to develop in our analysis of S. 2146, many of these sites are not found to be economical for various reasons, including high per-unit costs due to small size, difficult siting or environmental restrictions, or location in areas with limited economic opportunity for additional generation capacity.

A recent study by DOE looked at the more narrow potential provided by non-powered dams. It found some 12,000 MW of potential capacity in this category, but did not evaluate the *economic* characteristics of this capacity. As part of an expanded research program, it would be useful to apply the same approach used in the 2003 INEEL study

for evaluating economic characteristics to an updated list of potential sites using current economic and cost factors.

**Q4.** Your CES analysis foresees tremendous increases for non-hydropower renewables like wind. With such an increase in intermittent generation sources, integration and reliability concerns we are already experiencing would also seem to increase. In my view, hydropower's integration services and grid benefits will be needed more than ever under this scenario. Did your modeling include a look at transmission issues, including hydropower's ancillary benefits, when coming up with your growth scenarios? Does EIA have any plans to conduct outreach to the hydropower industry to update, refine and seek input on their modeling?

**A4.** EIA represents a number of different potential grid impacts of intermittency from resources such as wind and solar in its projections. The modeling approach used to model intermittency does not pre-suppose technology solutions to address intermittency, but allows the model to select the best-fit technologies to maintain grid reliability. Hydropower is among the technologies available to the model that can be used to address the modeled impacts of intermittent generation. While EIA believes we have captured the most significant cost and operational constraints imposed by intermittent generation, the model used for the analysis of S. 2146 is a 22 region model of the U.S., with broad representation of regional grid reliability operations. Impacts and mitigation of intermittent generation that occur on a spatial or temporal scale not represented in the model are not addressed. EIA is currently in the process of updating hydro supply data based on more recent work from DOE and INEEL.

The impact of intermittent generation on grid operations occurs over a wide range of time-scales, and is largely dependent on geographical considerations of current and future grid operations. EIA is currently able to model those impacts that can be represented at

the level of a regional grid operator (such as a Regional Transmission Operator or Independent System Operator), and over a time-scale of a few hours to seasonal. Modeled impacts include impacts to and valuation of the seasonal and time-of-day value for energy and capacity displaced by the intermittent resource, the need to ensure adequate planning reserves to ensure reliable grid operations, the potential for over-production during times of low energy demand, and the self-limiting benefits of geographic dispersion of the intermittent resource in mitigating these factors. While the intra-hourly adjustments to operating capacity and operational reserves to maintain system stability are not specifically modeled, the model does ensure that the capacity necessary to conduct these operations is accounted for in the projections. This ensures that the major cost of this impact is represented.

## QUESTIONS FROM SENATOR CANTWELL

- Q1.** I recognize that much of the debate around this Clean Energy Standard (CES) proposal focuses on the costs. Particularly from special interests that are determined to maintain the status quo against what I think is America's self-interest -- making our electricity system cleaner, more diverse, and more distributed. To that end, I am puzzled as to why Energy Department models continue to project steady or even escalating costs for emerging energy technologies, when over time history has consistently shown the opposite.

My experience at a technology company taught me that innovation, scale, and American entrepreneurship always figure out how to drive down costs over the long term. We see that everywhere, particularly in the high tech fields whether it be cell phones, or laptops, or flat screen TVs, or solar panels. In 2000, a 50-inch plasma TV sold for roughly \$20,000 dollars. The price fell to roughly \$4,000 in 2005. Today, these TVs sell for \$600-800 dollars. That's an 80 percent reduction from 2000 to 2005. And an additional 80 percent reduction between 2005 and 2012.

The same thing is happening with clean energy. Just this week, Bloomberg New Energy Finance released a report finding that average solar PV module prices have fallen by nearly 75 percent in the past three years. Solar power is now competitive with daytime retail power prices in a number of countries. The same Bloomberg report also found that these recent reductions in PV prices are likely to be sustainable, as they are primarily a reflection of reductions in manufacturing costs.

EIA's energy model is used extensively by policymakers and is very influential on our energy debates. Why are the projections so pessimistic about future costs?

- A1.** EIA does not reflect escalating costs for clean technologies in its analyses. In fact, EIA currently projects substantial reductions in the cost of clean energy technologies, in both its Reference case, as well as in the analysis of S. 2146. In some cases, such as with PV, these cost reductions are projected at a rate that is in excess of recent historic experience with the technology in question. However, in addition to technology costs, EIA also recognizes that in many cases renewables have geographic or other resource constraints that may impact total development and installation costs. In some cases, these additional

resource-based costs may work against reductions in technology costs that are projected in the model.

EIA has long recognized the importance of modeling both the reduction of technology cost through both market and non-market impacts as well as modeling the impact on cost of any constraints imposed by specific energy resources. Technology costs are generally reduced in the model through a combination of learning-by-doing effects on capital cost, learning-by-doing improvements to performance, non-market cost reductions that might come from public or private investment in research and development, and potentially through reductions in raw material commodity costs for key construction materials used in the electric power sector.

The aggregate impact of these cost reductions is substantial. In the S. 2146 analysis, the aggregate effective “learning rate” for utility-scale solar PV technology was a 21 percent cost reduction for every doubling of capacity. Data developed by the Department of Energy (DOE) through Lawrence Berkley National Laboratory (LBNL) suggests a cumulative historical learning rate of about 6 percent cost reduction for every doubling of capacity. Projected cost reductions for residential and commercial PV installations compare similarly to historical experience.

For wind, projected costs by 2035 are reduced 25 percent from current cost estimates. Again, using historical data from DOE/LBNL, this compares to a cost *increase* in this technology of almost 100 percent over the past 10 years, a period of time over which the



wind industry has grown ten-fold. This projected reduction in capital cost is accompanied by a projection for substantial increase in performance of wind technology, which helps to further reduce the technology cost contribution to total energy production cost. Additional development costs for wind, to account for its remote location, siting constraints, and alternative land use values, vary significantly by region and over time. In some cases, these additional development costs may not affect the assumed technology costs, but in other cases, they may more than double the potential cost to develop a site in a region that has already exploited its lowest cost resources.

Importantly, the same basic structure of cost reductions from learning-by-doing, performance improvement, and commodity price impacts are applied to all electric power sector technologies considered in this study. In general, more well established technologies like natural gas and wind will have lower learning potential than less commercially established technologies like solar or carbon capture and sequestration.

- Q2.** Any policy, such as a Clean Energy Standard or a price on carbon, needs to be compared to a business-as-usual or reference case. I'm not convinced the typical reference case includes all of the costs of inaction or business-as-usual.

In general, I think the debate on climate and energy policy has fixated too much on the potential costs of reducing our emissions, while ignoring the enormous costs of inaction. And the modeling efforts are partly to blame.

Other countries are seizing the tremendous economic opportunities that the global clean energy market offers the United States. Approximately \$7 trillion in new capital will be invested between now and 2030 in the global renewable energy market. How should we take into account the cost of losing out on this global market opportunity and falling further behind our global competitors like China?

- A2.** Examination of the potential international trade implications of a CES policy on the environmental costs of rising atmospheric concentrations of greenhouse gas emissions

are beyond the scope of EIA's analysis, which focuses primarily on the energy market impacts of the proposed policy.

- Q3.** The real costs of greenhouse gas emissions are also not considered in these cost estimates. A recent National Research Council report surveyed the cost imposed on society from emitting each ton of carbon dioxide. It found that each emitted ton costs between a few dollars to hundreds of dollars – depending on the assumptions used.

Even at the low end of a few dollars per ton, that translates into tens of billions of dollars per year in costs on society. The cumulative impacts of historic emissions are hitting us already. Climate change impacts are estimated to be 10 billion dollars per year in my home state alone by 2020. These staggering costs should be a call to action because they are only going to accumulate and get worse if we continue to do nothing. In presenting the difference in costs between business-as-usual and a given policy scenario, why are these costs of inaction not included?

- A3.** Examining the potential benefits of reducing greenhouse gas emissions was not within the scope of EIA's analysis. Consistent with EIA's mission, our analysis addresses the energy market impacts of the proposed policy. We agree that the benefits of policy action identified by others such as the National Research Council should be taken into account as policies are developed.

## QUESTIONS FROM SENATOR SANDERS

**Q1.** One potential challenge to ensuring that all technologies that qualify for credits or partial credits under the CES actually reduce emissions is related to natural gas fracking. Some reports indicate that fracking, in addition to presenting water quality concerns, also can lead to substantial additional emissions through methane release which when combined with emissions at a power plant stack, could make natural gas higher in carbon on a lifecycle basis than is commonly understood. What policies could Congress employ in a CES to ensure that natural gas emissions are evaluated on a full lifecycle basis and how would those policies impact your CES analysis, if at all?

**A1.** Although it provides some incentive to reduce carbon dioxide emissions in the electric power sector, the CES policy analyzed is not a comprehensive tool to control the release of greenhouse gas emissions throughout the economy. Consistent with its statutory role, EIA does not propose policies or provide recommendations on policy design. However, any policy design change that added cost or reduced the compliance value of natural gas under a CES would likely cause a shift towards increased reliance on alternative compliance strategies at some additional cost.

**Q2.** Some states including Vermont have an energy relationship with Canada. Vermont uses Canadian hydropower to meet a substantial portion of our electricity needs. What recommendations do you have to account for this relationship through a CES, and also to ensure that to the extent American clean or renewable energy generators sell energy to Canada, that they receive reciprocal treatment, and how would such policies impact your analysis of the CES if at all?

**A2.** Consistent with its statutory role, EIA does not propose policies or provide recommendations on policy design. If a specific proposal for allowing imported clean energy to qualify for the CES is proposed, EIA may be able to model the impacts.

Canada in particular has abundant existing and potential hydro-electric resources and extensive grid connections to the U.S. Total imports from Canada are about 44 bkWh,

however EIA is not currently able to distinguish the fuel source for much of this generation. In 2010, Canada generated 348 bkWh of electricity from hydro-electric and other clean resources, which comprises a significant fraction of the clean energy targets in S. 2146, especially in the early years of the program. To assess a provision to allow this generation to count under a CES policy, EIA would need to know the specifics of the policy, such as any restrictions on imports or any policy mechanisms in place to account for the potential to trade non-qualifying U.S. generation for qualifying imported generation.

## **QUESTIONS FROM SENATOR MANCHIN**

**Q1.** In your Administration's analysis of the Clean Energy Standard, you project two thirds of our nation's coal energy to be lost. How many coal plants are to be retired in West Virginia as a result of this policy?

**A1.** EIA models electric power systems at the regional, and not the State, level. Therefore EIA cannot make projections for individual States. West Virginia lies within the RFC-West region (RFCW) in the EIA model, which also includes Ohio, Indiana, some of Western Pennsylvania, the Chicago metropolitan area, and smaller portions of Wisconsin, Michigan, Maryland, Virginia, and Kentucky.

Within the RFCW region, 10.5 GW more coal-fired generating capacity is retired in the BCES12 scenario than in the Reference case, for a total of 22 GW of coal retirements by 2035 across the region. This represents about 30 percent of the 2010 coal capacity in that region. Coal retirements are higher in RFCW than in any other region.

In 2010, West Virginia had 42 coal-fired generators at 36 plants, with a total of 14.5 GW of coal-fired capacity, representing 20% of coal-fired capacity in the RFCW region.

**Q2.** On a regional basis, whose electricity prices will increase the most based on these retirements?

**A2.** Variations in projected electricity prices reflect a multitude of changes in the energy sector, without a clear line of causality between plant retirements and projected electricity prices. Also, because baseline electricity prices differ significantly across regions, absolute and percentage price impacts generally differ.

While the RFC-West (RFCW) region has the highest overall level of coal capacity retirements, nine other regions see larger electricity price increases in percentage terms. For the RFCW region, average delivered power prices in the BCES12 scenario are 22% higher than in the Reference case. This is the 10<sup>th</sup> highest price increase out of the 22 regions. The largest increases in average delivered 2035 power prices between the policy scenario and the Reference case are in Midwest Reliability Organization / East (MROE) and the WECC / Rockies (RMPA) regions, both at 36%. Both regions have about 2 GW of coal retirements.

RFCW has the highest overall level of projected coal retirements, at 22 gigawatts (GW). The SERC / Virginia-Carolina (SRVC) region has the next highest level of projected coal retirements, at 14 GW, with a projected price difference lower than that of RFCW, at 16%. All other regions have 7 GW or fewer of projected coal retirements, including eight of the ten regions with the highest price increases.

- Q3.** Your analysis also shows that coal-fired power will be replaced in part by 80 gigawatts of nuclear power. What do you assume the cost of these plants to be, both in aggregate and to replace power provided by West Virginia?
- A3.** In the BCES12 scenario, a net 83 GW of nuclear power are added by 2035, as compared to a net nuclear increase of only 11 GW in the Reference case. These nuclear additions are economic only in certain regions of the country, primarily in the Southeast, Texas, and Arizona/New Mexico. West Virginia lies within the RFCW region in EIA's model. While the Southeast United States is electrically connected to West Virginia, power

transfers between those regions are limited and EIA does not assume nuclear stations in the Southeast are added to replace power retired in West Virginia or the RFCW region.

For the BCES12 analysis, EIA estimates a total system levelized cost (including transmission) for nuclear plants of \$112/MWh (in 2010 dollars), comparable to the levelized cost of an advanced coal plant, at \$111/MWh, for a plant that would enter service in 2017. In RFCW, retiring coal capacity is primarily replaced by natural gas-fired combined cycle capacity, which has a levelized cost of about \$72/MWh for plants entering service in 2017.

However, this comparison (levelized coal costs to levelized combined cycle costs) is most useful for choosing between the two options for building new system capacity. In the BCES12 case, we are instead replacing existing coal capacity with new combined cycle gas-fired capacity. System costs are increased when new combined cycle units are built to displace existing coal generation, where capital costs have largely been recovered. In this case, comparing the \$72/MWh levelized cost of the combined cycle unit and the variable cost of the coal unit (\$28/MWh), is a better measure of the increase to system costs.

**Q4.** Who will bear the cost of building these nuclear power plants?

**A4.** The cost of building CES-qualifying generators, including nuclear plants, is assumed to be recovered through either competitive wholesale power markets or cost of service regulation, depending on how electricity markets are structured in each region, and supplemented in either case by the supplemented trading of Clean Energy Credits. The portions of costs that represent the baseline, least-cost system configuration are assumed to be recovered directly from the customers of the plant, as they would be without a CES in place. Any costs in excess of this would be recovered through collection of Clean Energy Credit payments, which could potentially come from other covered utilities anywhere in the U.S. Depending on how nuclear costs compare to the cost of other qualifying generation, the credit payments may or may not provide revenue in excess of minimum plant requirements. Any surplus revenues may revert to the plant owner or to customers of the utility purchasing that unit's power, depending on contract terms and the structure of the electricity market in each area.

The proposed CES is established as a compliance trading system. With such a system, similar to the Acid Rain program under the Clean Air Act, a national target is set. Rather than forcing each retail seller to meet the target with physical generation, covered sellers may purchase some or all of the generation needed for compliance from other utilities and participating generators in the form of credits. Clean Energy Credits do not require the physical transfer of electricity, but simply operate as a compliance mechanism that ensures that sufficient generation is produced to meet the national target.



Under such a trading system, the credit price should cover any “above market” costs for the marginal qualifying generator – that is, the qualifying generator that requires the highest payment above any revenues received in the energy market to cover the cost of building and operating the unit. Thus a qualifying generator with lower costs can recover more revenue than is needed to cover costs. In a cost-of-service regulated market, the regulator will determine how this excess revenue is distributed between the generator and the customers. In a competitive wholesale market, the market will determine the allocation of this revenue.

- Q5.** In your constrained nuclear case, why does coal with CCS not play a part?
- A5.** In the case that we ran that constrained nuclear builds, we get about 13,000 MW of coal capacity that is retrofitted with carbon capture and sequestration (CCS). This compares to no CCS retrofits in the main BCES12 case, where nuclear builds are not constrained. We get about 900 MW of new coal capacity with CCS in both the BCES12 case and the Constrained Nuclear case, which is also what gets built in our Reference case.

In the Constrained Nuclear case, credit prices are somewhat higher than in the main BCES12 case because compliance options are more limited. These credit prices are high enough to support limited deployment of CCS technology by retrofitting existing coal plants with the necessary equipment. However, the availability of an Alternative Compliance Payment of 3 cents per kWh (increasing at 5 percent per year in real dollars) provides a constraint on the level of the credit price, and it is not able to rise to a point sufficient for the model to increase deployment of CCS technology in the time frame examined.

**Q6.** If natural gas fills the void left by nuclear power, how much more gas is needed for power generation and how much less gas is used in industrial applications?

**A6.** Because nuclear power plays its most significant role at the end of the projections period, this response focuses on results for 2035. In the Constrained Nuclear case, natural gas consumption in the electric power sector increases by about 880 billion cubic feet, or about 10 percent in 2035 compared to the main BCES12 case, and by 1,180 billion cubic feet, or 13 percent, compared to the Reference case. In the industrial sector, natural gas consumption in the Constrained Nuclear case by 2035 is essentially unchanged from the main BCES12 case, with an increase of about 9 billion cubic feet, or about 0.1 percent. In both cases, although natural gas prices increase, industrial natural gas consumption is about 2 percent more than in the Reference case in 2035 because there is additional industrial cogeneration of power with natural gas.

As suggested in the question, the increased demand for natural gas in the electric power sector in the Constrained Nuclear case is largely the result of the use of this fuel as one of several strategies for meeting the CES targets without building new nuclear facilities.

In the industrial sector, natural gas use is responding to a number of factors with respect to natural gas use, including overall demand for industrial production, natural gas prices, the potential to offset increased electricity prices, and the potential to earn revenue from the sale of Clean Energy Credits from gas-fired combined heat and power systems.

Although natural gas prices are somewhat higher in the Constrained Nuclear case than in

the main BCES12 case, industrial demand is maintained as there is additional incentive to increase the use of combined heat and power operations.

**Q7.** How much more drilling must take place to meet the imposed natural gas demand in this scenario?

**A7.** In the Constrained Nuclear case, natural gas drilling increases by about 2,180 wells, or about 6 percent, in 2035 compared to the main BCES12 case, and by 2,834 wells, or 7 percent, compared to the Reference case. Between 2012 and 2035 in the Constrained Nuclear case, over 40,000 more natural gas wells are completed than in the main BCES12 case and over 67,000 more natural gas wells are completed than in the Reference case.



**Department of Energy**  
Washington, DC 20585

December 20, 2012

The Honorable Cliff Stearns  
Chairman  
Subcommittee on Oversight and Investigations  
Committee on Energy and Commerce  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On April 18, 2012, Christopher Johns, Director, Office of Budget, testified regarding the "Budget and Spending Concerns at DOE."

Enclosed are the answers to 10 questions that were submitted by Representative Joe Barton and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis", is positioned above the printed name.

Christopher E. Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures



## QUESTION FROM REPRESENTATIVE STEARNS

Q1. Please explain in detail why DOE's budget rose substantially between 2000 and today even though the number of employees and contractors stayed roughly the same.

A1. Budget increases over the time period from FY 2000 to the FY 2013 request level and associated Federal personnel increases can be attributed largely to increases in

- NNSA (+\$5,542m, +24% Full Time Equivalents (FTEs)),
- Energy Efficiency and Renewable Energy (+\$1,285m, +38% FTEs),
- Science (+\$2,193m, -1% FTEs).

Offset in part by decreases in

- Environmental Management (-\$298m, -40% FTEs), and
- Civilian Radioactive Waste Management (-\$340m, -100% FTEs).

However, large apparent increases in appropriated dollars are reduced by the effects of inflation. Figure 1 depicts the DOE budget grouped in four categories in nominal or 'then-year' dollars. Peak funding levels of about \$70 billion off-scale on the chart in FY 2009 depict the one-time Recovery Act funding, which did cause an increase in staffing in temporary positions for the purpose of management of these accounts.

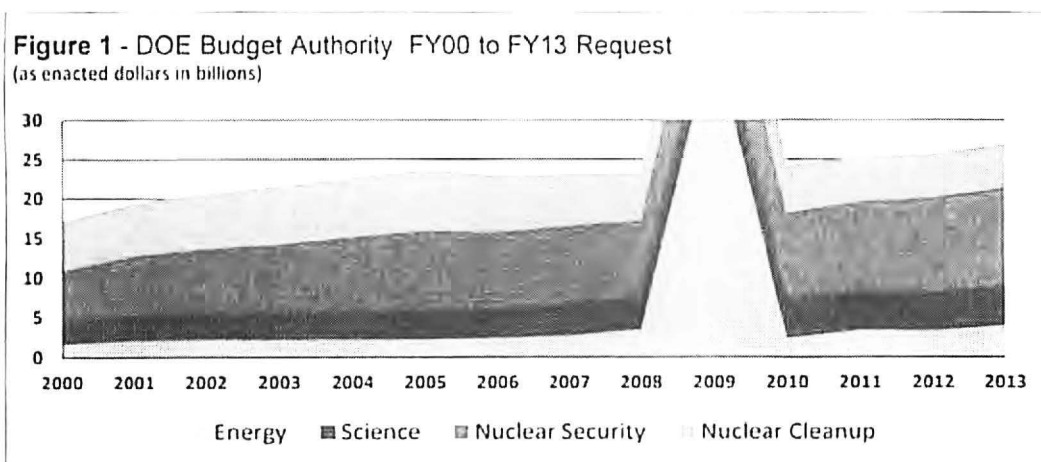


Figure 2 represents the same interval in FY 2012 constant dollars. While the overall increase in DOE Budget Authority in 'as enacted' dollars is about 53%, when the increase is calculated in terms of FY 2012 constant dollars it is only about 15.6%, or about 1.1% per year over inflation over the course of the 13 year interval with most of that growth occurring in FY 2001 and sustained thereafter. The largest percentage-wise increase is in Energy, while the largest overall increase is in Nuclear Security.

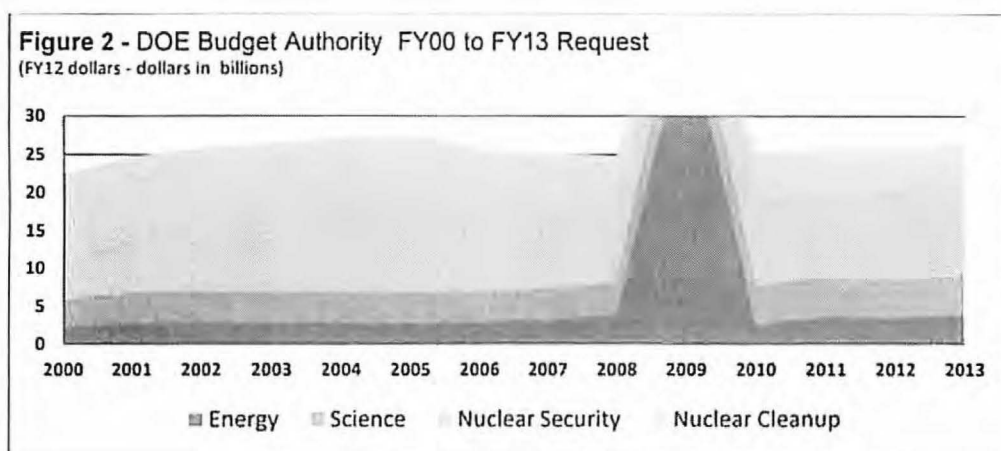


Table 1 shows these changes by functional grouping from FY 2000 to the President's FY 2013 Budget. Increases in Energy, Science, and Nuclear Security are partially offset by decreases in real terms in Nuclear Cleanup, Provision and Regulation (petroleum reserves and power marketing administration), and Mission Support.

<b>Table 1 - DOE Changes from FY 2000 to FY 2013 President's Request</b> (Constant FY12 \$s in thousands)*		
<b>DOE Group/Changes</b>	<b>\$ Changes</b>	<b>% Changes</b>
Energy	1,783,476	80.1%
Science	1,253,875	34.3%
Nuclear Security	3,694,879	44.1%
Nuclear Cleanup	-2,608,246	-31.9%
Provision & Regulation	-486,550	-100.2%
Mission Support	-25,466	-13.5%
<b>DOE, Total change</b>	<b>3,611,968</b>	<b>15.6%</b>

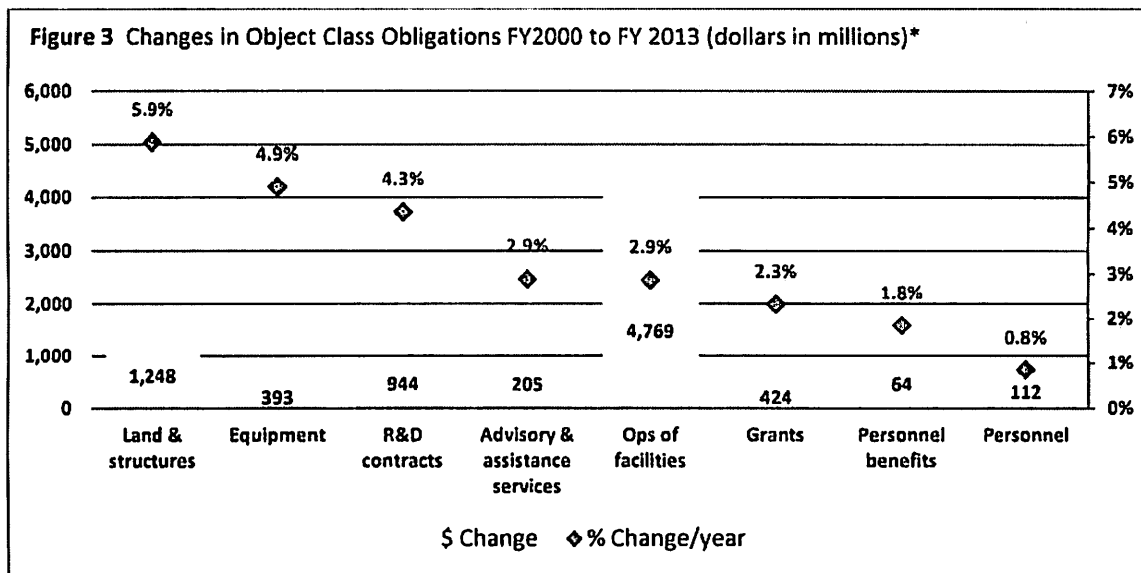
**\*Estimates subject to uncertainties due to budget comparability issues.**

DOE has worked to achieve a more efficient staffing level consistent with program workload, but reductions in some areas have been offset by increases in personnel needed in national and homeland security in the post-9/11 decade, as well as in the pursuit of national priorities in the development of science and technology, and in achieving our goals in the development of energy technologies. DOE science and technology, in particular energy technology are recognized as the engines of future economic growth. DOE Federal FTE usage, excluding FERC, over the time period from FY 2000 to FY 2011 (for which there are full year actual values) increased overall from 14,361 to 14,663 or by about 2.1%; while over the same interval DOE M&O contractor employees fell an estimated 3.4% from 100,333 to 96,873.

Personnel numbers are not strictly proportional to the overall budget numbers as there are parts of the budget that fund outside participation, in the form of: contracts with industry; grants; cooperative efforts; construction of facilities; and equipment purchases. These expenditures do not tend to add significantly to either the Federal workforce or the M&O contractor staffing levels. A construction project may employ many industry contractors but have relatively few Federal employees, or M&O contractors in management or support of that contract. While grant money in pursuit of Department research goals may employ many academic participants, these researchers would not be counted on the Department's roles as either Federal employees nor would they be counted as M&O contractors.

Workers who perform under support service contracts, a range of advisory service contracts, or R&D service contracts would also not add to the count of Federal employees or M&O contractors, but certainly have an effect on the budget and the overall amount of work that can be performed.

Figure 3 depicts the changes in object class obligations from FY 2000 to FY 2013 in those classes with the greatest average yearly percentage changes. ‘Personnel’ reflects Federal employees only; not all object classes are shown for clarity and readability. With underlying GDP inflation averaging a bit over two percent over this time period, the chart shows which categories contributed most to the growth in the DOE topline.



\*FY 2013 obligations estimated at FY 2013 President's Budget levels.



## **QUESTION FROM REPRESENTATIVE STEARNS**

**Q2. Please provide DOE's plan for compliance with Executive Order 13589, as submitted to the Office of Management and Budget.**

**A2. On November 9, 2011, the President issued Executive Order 13589 requiring executive agencies to submit a plan to the Office of Management and Budget (OMB) for reducing the combined costs in Fiscal Year (FY) 2013 for expenses, such as travel, employee IT devices, executive fleet costs, printing and miscellaneous promotional items by not less than 20 percent below FY 2010 levels. On December 12, 2011, the Department of Energy submitted its plan with specific targets to OMB. On March 12, 2012, the Department communicated to OMB its progress in savings during the first quarter of FY 2012. OMB has not yet released any data to the public, but the Department looks forward to sharing this information with the Committee as soon as it becomes available.**

## QUESTION FROM REPRESENTATIVE STEARNS

- Q3. I thank you for providing information on the DOE's vehicle fleet on April 27, 2012, as you had promised. However, as additional follow-up, please provide an inventory of these vehicles organized by DOE office or laboratory.
- A3. DOE's vehicle fleet inventory is listed below. DOE vehicle fleet totals and breakout is per the Federal Automotive Statistical Tool (FAST) FY 2011 year-end report (as of December 15, 2011). FAST is the *system of record* for motor vehicle inventories. It is aggregate data reported as year-end inventory balances. As such, it *does not and will not* discretely identify a vehicle turn-in executed in response to the Secretary's challenge to reduce 35%. FAST provides a one-time look at vehicle inventory data, as it is a statistical tool, not a fleet management information system. Updates, i.e., acquisitions, dispositions, rotations, will occur during the year, and periodic updates are made in the system.

### Department of Energy Vehicle Fleet Inventory

Primary: DOE Office - Site Office/Laboratory

Secondary: Vehicle Type

- (a) Passenger: includes sedans; SUVs; light, medium and heavy duty vans; buses; light, medium, and heavy duty trucks; some may be dual-use (passenger and cargo).
- (b) Cargo: includes cargo vans and trucks.
- (c) Emergency Response: includes law enforcement, emergency response and ambulances.

### Federal Energy Regulatory Commission

Federal Energy Regulatory Commission

5 – Vehicles

- (a) Passenger - 3
- (b) Cargo - 2
- (c) Emergency Response - 0

### Headquarters Site Office

DOE Headquarters Fleet

26 – Vehicles

- (a) Passenger - 17
- (b) Cargo - 5
- (c) Emergency Response - 4

Health, Safety & Security - National Training Center

25 – Vehicles

- (a) Passenger - 10
- (b) Cargo - 13
- (c) Emergency Response - 2

<u>Office of Legacy Management</u>	43 – Vehicles
(a) Passenger - 28	
(b) Cargo - 15	
(c) Emergency Response - 0	

## **National Nuclear Security Administration**

### **Nevada Operations**

<u>Livermore Operations-Livermore, CA</u>	4 – Vehicles
(a) Passenger - 4	
(b) Cargo - 0	
(c) Emergency Response - 0	

<u>Nevada Site Office</u>	29 – Vehicles
(a) Passenger - 29	
(b) Cargo - 0	
(c) Emergency Response - 0	

<u>Nevada Test Site</u>	957 – Vehicles
(a) Passenger - 468	
(b) Cargo - 379	
(c) Emergency Response - 110	

<u>Remote Sensing Laboratory-Andrews AFB - MD</u>	12 – Vehicles
(a) Passenger - 7	
(b) Cargo - 5	
(c) Emergency Response - 0	

<u>Special Technologies Laboratory-Santa Barbara, CA</u>	3 – Vehicles
(a) Passenger - 2	
(b) Cargo - 1	
(c) Emergency Response - 0	

### **NNSA Service Center – Albuquerque**

<u>Albuquerque Site Office NM</u>	34 – Vehicles
(a) Passenger - 25	
(b) Cargo - 9	
(c) Emergency Response - 0	

<u>Honeywell Kansas City Plant, MO</u>	12 – Vehicles
(a) Passenger - 8	
(b) Cargo - 4	
(c) Emergency Response - 0	

<u>Honeywell, NM</u>	16 – Vehicles
(a) Passenger - 16	
(b) Cargo - 0	
(c) Emergency Response - 0	
<u>Lawrence Livermore National Laboratory</u>	819 – Vehicles
(a) Passenger - 418	
(b) Cargo - 367	
(c) Emergency Response - 34	
<u>Livermore Site Office</u>	10 – Vehicles
(a) Passenger - 10	
(b) Cargo - 0	
(c) Emergency Response - 0	
<u>Los Alamos National Laboratory</u>	1,582 – Vehicles
(a) Passenger - 805	
(b) Cargo - 682	
(c) Emergency Response - 95	
<u>Los Alamos Site Office</u>	26 – Vehicles
(a) Passenger - 26	
(b) Cargo - 0	
(c) Emergency Response - 0	
<u>Pantex Plant, TX</u>	450 – Vehicles
(a) Passenger - 167	
(b) Cargo - 108	
(c) Emergency Response - 175	
<u>Savannah River/Mixed Oxide (MOX)</u>	39 – Vehicles
(a) Passenger - 28	
(b) Cargo - 11	
(c) Emergency Response - 0	
<u>Sandia National Laboratory (SNL) CA, Livermore</u>	37 – Vehicles
(a) Passenger - 13	
(b) Cargo - 15	
(c) Emergency Response - 9	
<u>SNL Hawaii and Alaska</u>	7 – Vehicles
(a) Passenger - 3	
(b) Cargo - 4	

(c) Emergency Response - 0

SNL Nevada, Tonopah Test Range

79 – Vehicles

(a) Passenger - 41

(b) Cargo - 34

(c) Emergency Response - 4

SNL New Mexico

656 – Vehicles

(a) Passenger - 363

(b) Cargo - 266

(c) Emergency Response - 27

**Oak Ridge Office (NNSA)**

BWXT - Y-12

564 – Vehicles

(a) Passenger - 414

(b) Cargo - 128

(c) Emergency Response - 22

Wackenhut Services, Inc. (NNSA)

115 – Vehicles

(a) Passenger - 34

(b) Cargo - 6

(c) Emergency Response - 75

**Office of Secure Transportation Roll-up**

Office of Secure Transportation MSA/CMSA

223 – Vehicles

(a) Passenger - 80

(b) Cargo - 12

(c) Emergency Response - 131

Office of Secure Transportation Non-MSA

204 – Vehicles

(a) Passenger - 75

(b) Cargo - 27

(c) Emergency Response - 102

**Naval Reactors Laboratory Field Office**

Bettis Atomic Power Laboratory

69 – Vehicles

(a) Passenger - 34

(b) Cargo - 22

(c) Emergency Response - 13

Knolls Atomic Power Laboratory

59 – Vehicles

- (a) Passenger - 16
- (b) Cargo - 30
- (c) Emergency Response - 13

**Office of Energy Efficiency and Renewable Energy**

**Golden Field Office**

National Renewable Energy Laboratory

50 – Vehicles

- (a) Passenger - 34
- (b) Cargo - 16
- (c) Emergency Response - 0

**Office of Environmental Management**

**Carlsbad Field Office**

Carlsbad Field Office

37 – Vehicles

- (a) Passenger - 19
- (b) Cargo - 17
- (c) Emergency Response - 1

**EM Consolidated Business Center-Cincinnati**

Cincinnati

3 – Vehicles

- (a) Passenger - 3
- (b) Cargo - 0
- (c) Emergency Response - 0

Rocky Flats Building 55

1 – Vehicle

- (a) Passenger - 1
- (b) Cargo - 0
- (c) Emergency Response - 0

**EM Small Projects Office**

Energy Technology Engineering Center

1 – Vehicle

- (a) Passenger - 1
- (b) Cargo - 0
- (c) Emergency Response - 0

West Valley

22 – Vehicles

- (a) Passenger - 15
- (b) Cargo - 7
- (c) Emergency Response - 0

**Grand Junction**Grand Junction Office

4 – Vehicles

- (a) Passenger - 4
- (b) Cargo - 0
- (c) Emergency Response - 0

MOAB Uranium Mill Tailings Remedial  
Action (UMTRA) Project (RAC)

30 – Vehicles

- (a) Passenger - 20
- (b) Cargo - 10
- (c) Emergency Response - 0

MOAB UMTRA Project (TAC)

7 – Vehicles

- (a) Passenger - 4
- (b) Cargo - 3
- (c) Emergency Response - 0

**Portsmouth/Paducah Project Office (PPPO)**Depleted Uranium Hexafluoride (DUF-6)

16 – Vehicles

- (a) Passenger - 16
- (b) Cargo - 0
- (c) Emergency Response - 0

Paducah Deactivation and Decommissioning

119 – Vehicles

- (a) Passenger - 100
- (b) Cargo - 19
- (c) Emergency Response - 0

Paducah Infrastructure

32 – Vehicles

- (a) Passenger - 25
- (b) Cargo - 7
- (c) Emergency Response - 0

Portsmouth Gaseous Diffusion Plant

145 – Vehicles

- (a) Passenger - 125
- (b) Cargo - 20
- (c) Emergency Response - 0

PPPO Offices

16 – Vehicles

- (a) Passenger - 16
- (b) Cargo - 0
- (c) Emergency Response - 0

**Richland Operations Office**

**Richland - Office of River Protection**

Bechtel National, Inc. 79 – Vehicles  
(a) Passenger - 37  
(b) Cargo - 42  
(c) Emergency Response - 0

**Richland/Hanford**

Mission Support Alliance 1,462 – Vehicles  
(a) Passenger - 616  
(b) Cargo - 44  
(c) Emergency Response - 85

Washington Closure Hanford 208 – Vehicles  
(a) Passenger - 53  
(b) Cargo - 155  
(c) Emergency Response - 0

**Savannah River Operations Office**

Savannah River Nuclear Solutions 1,002 – Vehicles  
(a) Passenger - 558  
(b) Cargo - 431  
(c) Emergency Response - 13

Wackenhut Services, Inc.-Savannah River 123 – Vehicles  
(a) Passenger - 22  
(b) Cargo - 10  
(c) Emergency Response - 91

**Office of Fossil Energy**

**National Energy Technology Laboratory**

Albany Research Center 4 – Vehicles  
(a) Passenger - 3  
(b) Cargo - 1  
(c) Emergency Response - 0

National Energy Technology Laboratory-PA 48 – Vehicles  
(a) Passenger - 29  
(b) Cargo - 16  
(c) Emergency Response - 3



National Energy Technology Laboratory-WV 22 – Vehicles  
(a) Passenger - 18  
(b) Cargo - 3  
(c) Emergency Response - 1

**Naval Petroleum Reserves**

Naval Petroleum and Oil Shale Reserves CO, UT, WY 30 – Vehicles  
(a) Passenger - 29  
(b) Cargo - 1  
(c) Emergency Response - 0

**Strategic Petroleum Reserve (SPR) Project Management Office**

SPR Bayou Choctaw 20 – Vehicles  
(a) Passenger - 7  
(b) Cargo - 7  
(c) Emergency Response - 6

SPR Big Hill 31 – Vehicles  
(a) Passenger - 10  
(b) Cargo - 12  
(c) Emergency Response - 9

SPR Bryan Mound 25 – Vehicles  
(a) Passenger - 5  
(b) Cargo - 11  
(c) Emergency Response - 9

SPR Project Office LA 28 – Vehicles  
(a) Passenger - 17  
(b) Cargo - 4  
(c) Emergency Response - 7

SPR West Hackberry 33 – Vehicles  
(a) Passenger - 9  
(b) Cargo - 13  
(c) Emergency Response - 11

## **Office of Nuclear Energy, Science and Technology**

### **Idaho Operations Office**

#### BBWI

108 – Vehicles

- (a) Passenger - 91
- (b) Cargo - 17
- (c) Emergency Response - 0

#### CWI

223 – Vehicles

- (a) Passenger - 119
- (b) Cargo - 104
- (c) Emergency Response - 0

#### Idaho National Laboratory-BEA

593 – Vehicles

- (a) Passenger - 425
- (b) Cargo - 154
- (c) Emergency Response - 14

## **Office of Science**

### **Chicago Office**

#### Ames Laboratory

4 – Vehicles

- (a) Passenger - 3
- (b) Cargo - 1
- (c) Emergency Response - 0

#### Argonne East

136 – Vehicles

- (a) Passenger - 81
- (b) Cargo - 42
- (c) Emergency Response - 13

#### Brookhaven National Laboratory

316 – Vehicles

- (a) Passenger - 113
- (b) Cargo - 188
- (c) Emergency Response - 15

#### Fermi National Accelerator Laboratory

219 – Vehicles

- (a) Passenger - 124
- (b) Cargo - 90
- (c) Emergency Response - 5

<u>Lawrence Berkeley National Laboratory</u>	225 – Vehicles
(a) Passenger - 163	
(b) Cargo - 59	
(c) Emergency Response - 3	
<u>Princeton Plasma Physics Laboratory</u>	28 – Vehicles
(a) Passenger - 10	
(b) Cargo - 12	
(c) Emergency Response - 6	
<b>Oak Ridge Office</b>	
<u>ISOTEK</u>	1 – Vehicle
(a) Passenger - 1	
(b) Cargo - 0	
(c) Emergency Response - 0	
<u>Oak Ridge Institute for Science and Education</u>	27 – Vehicles
(a) Passenger - 11	
(b) Cargo - 14	
(c) Emergency Response - 2	
<u>Oak Ridge Operations (Fed)</u>	87 – Vehicles
(a) Passenger - 50	
(b) Cargo - 30	
(c) Emergency Response - 5	
<u>Office of Scientific and Technical Information</u>	4 – Vehicles
(a) Passenger - 3	
(b) Cargo - 1	
(c) Emergency Response - 0	
<u>Pacific Northwest National Laboratory</u>	112 – Vehicles
(a) Passenger - 45	
(b) Cargo - 64	
(c) Emergency Response - 3	
<u>Stanford Linear Accelerator</u>	142 – Vehicles
(a) Passenger - 74	
(b) Cargo - 68	
(c) Emergency Response - 0	

<u>Stanford Site Office</u>	1 – Vehicle
(a) Passenger - 1	
(b) Cargo - 0	
(c) Emergency Response - 0	
<u>Thomas Jefferson National Laboratory</u>	26 – Vehicles
(a) Passenger - 12	
(b) Cargo - 14	
(c) Emergency Response - 0	
<u>URS/CH2M of Oak Ridge</u>	218 – Vehicles
(a) Passenger - 166	
(b) Cargo - 52	
(c) Emergency Response - 0	
<u>UT-Battelle</u>	498 – Vehicles
(a) Passenger - 319	
(b) Cargo - 173	
(c) Emergency Response - 6	
<u>Wackenhut Services, Inc. (DOE)</u>	56 – Vehicles
(a) Passenger - 14	
(b) Cargo - 1	
(c) Emergency Response - 41	

#### **Power Marketing Administrations**

##### **Bonneville Power Administration**

<u>Bonneville Power Administration</u>	1,120 – Vehicles
(a) Passenger - 427	
(b) Cargo - 693	
(c) Emergency Response - 0	

##### **Southeastern Power Administration**

<u>Southeastern Power Administration</u>	3 – Vehicles
(a) Passenger - 3	
(b) Cargo - 0	
(c) Emergency Response - 0	

**Southwestern Power Administration**

<u>Gore Maintenance</u>	25 – Vehicles
(a) Passenger - 4	
(b) Cargo - 21	
(c) Emergency Response - 0	
 <u>Jonesboro Maintenance</u>	 19 – Vehicles
(a) Passenger - 3	
(b) Cargo - 16	
(c) Emergency Response - 0	
 <u>Springfield O&amp;M Office</u>	 22 – Vehicles
(a) Passenger - 4	
(b) Cargo - 18	
(c) Emergency Response - 0	
 <u>Springfield Operations</u>	 11 – Vehicles
(a) Passenger - 10	
(b) Cargo - 1	
(c) Emergency Response - 0	
 <u>Tulsa</u>	 10 – Vehicles
(a) Passenger - 7	
(b) Cargo - 3	
(c) Emergency Response - 0	

**Western Area Power Administration (WAPA)**

<u>WAPA CSO</u>	8 – Vehicles
(a) Passenger - 6	
(b) Cargo - 2	
(c) Emergency Response - 0	
 <u>WAPA Desert Southwest</u>	 129 – Vehicles
(a) Passenger - 61	
(b) Cargo - 67	
(c) Emergency Response - 1	
 <u>WAPA Rocky Mountain Office</u>	 255 – Vehicles
(a) Passenger - 89	
(b) Cargo - 166	
(c) Emergency Response - 0	

WAPA Upper Great Plains

247 – Vehicles

- (a) Passenger - 60
- (b) Cargo - 187
- (c) Emergency Response - 0

WAPA Sierra Nevada Region

52 – Vehicles

- (a) Passenger - 24
- (b) Cargo - 28
- (c) Emergency Response - 0

WAPA Sierra Nevada - non-MSA

10 – Vehicles

- (a) Passenger - 3
- (b) Cargo - 7
- (c) Emergency Response

## QUESTION FROM CONGRESSMAN STEARNS

- Q4. During the hearing, when asked what actions, if any, DOE is taking to identify potential duplication or overlap across the nearly 100 renewable energy initiatives hosted at DOE in Fiscal Year 2010 – as noted by GAO – in its February 27, 2012 report “Renewable Energy: Federal Agencies Implement Hundreds of Initiatives” (GAO-12-260) – you responded “we take very seriously the recommendations from GAO.”**
- a. Is DOE already taking steps to address this concern, or is DOE waiting for GAO to come out with further reports this Summer on duplication?**

**A4.**

The Department of Energy continually plans, reviews and assesses its renewable energy initiatives to ensure that they are complementary and not duplicative. DOE managers regularly meet with colleagues from other Program Offices within the Department, as well as other Federal agencies, to maintain open lines of communication and ensure that related initiatives are closely aligned and coordinated.

DOE's renewable energy initiatives noted in the GAO report are distributed across four offices within DOE – Energy Efficiency and Renewable Energy (EERE) , the Advanced Research Projects Agency – Energy (ARPA-E) , the Office of Electricity (OE), and the Office of Science (SC), using an integrated technology readiness level (TRL) approach. The TRL approach describes and directs the flow of our technology development portfolio from directed research and innovation through the stages of product and process development necessary to bring technology to market.

Coordinating and prioritizing these initiatives has enabled the Department to cost-effectively undertake multiple initiatives that together support DOE's mission of ensuring America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions. For example, DOE launched a new model of

cross-office R&D coordination with the SunShot Initiative, which harmonized the efforts of EERE, ARPA-E, and Office of Science around a single DOE-wide techno-economic goal: making electricity from solar energy cost-competitive with other conventional sources. In 2011, the Department created four “integrated technology teams” modeled after the success of SunShot: Batteries for Transportation; Biofuels; Grid Technologies; and Carbon Capture, Utilization, and Storage. These “tech teams” bring together program managers from different offices working in related technical areas, to develop cross-DOE techno-economic goals and coordinate R&D portfolios.



## QUESTION FROM CONGRESSMAN STEARNS

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**b.** If DOE is taking actions, what is the envisioned timeframe for their completion?

**A4b.** The Department of Energy engages in a continual process of review to assess its renewable energy initiatives to ensure that they are complementary and not duplicative. To this end, DOE managers regularly meet with colleagues from other Program Offices within the Department, as well as other Federal agencies, to maintain open lines of communications and ensure that related initiatives are closely aligned and coordinated. For example, DOE utilizes “integrated technology teams” to harmonize efforts across multiple offices. Created in 2011, these “tech teams” bring together program managers from different offices working in related technical areas, to develop cross-DOE techno-economic goals and coordinate R&D portfolios.

#### QUESTION FROM CONGRESSMAN STEARNS

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- c.** Are preliminary estimates available on the amount of savings to be obtained from reducing duplication across these initiatives?

**A4c.** Though no preliminary estimates are available, DOE is committed to using tax-payer dollars in the most effective and efficient way possible. In order to best support innovation and prosperity in the United States, the Department will continually work to address duplicative efforts and protect taxpayer investments.

## QUESTION FROM REPRESENTATIVE STEARNS

**Q5.** According to the OIG's November 2011 report, "Management Challenges at the Department of Energy," the National Nuclear Security Administration (NNSA) maintains a costly set of distinctly separate overhead and indirect cost operations that often duplicate existing DOE functions. These redundancies can complicate communications and program execution. What is DOE doing to eliminate these duplicative and redundant NNSA functions?

**A5.** As the IG pointed out in their report, the National Nuclear Security Administration (NNSA), as established under the National Defense Authorization Act of 2000 (as amended), is a semi-autonomous agency within the Department of Energy (DOE). We are working hard to find additional ways to reduce redundant costs and duplication of activities within the context of the formal alignment required by statute between the Department and NNSA. Examples of such efforts include:

- DOE/HR and NNSA/HR collaboration on all HR policies and initiatives covering competitive service and excepted service pay, leave, drug testing, workers compensation and staffing functions. NNSA participates in the development of Department HC directives and operating procedures. In addition, the two participate in Departmental workgroups and any new government-wide initiatives in the human capital arena.
- NNSA/GC and DOE/GC are not redundant in view of the separate and distinct interests, missions, and concerns of the respective organizations supported by the General Counsels. NNSA General Counsel's Office is driven by the specific unique matters facing the National Security Complex.. The two offices of general

**counsel work together collaboratively on issues of mutual interest and share resources where that is cost effective.**

## QUESTION FROM REPRESENTATIVE STEARNS

- Q6.** According to the report, the DOE operates laboratories, mostly managed and operated by contractors, at an annual cost of over \$10 billion. Support costs represent 35-40% of total laboratory operating costs, which may be unsustainable in the current budget environment. What effort is DOE taking to reduce administrative, overhead, and indirect costs at its laboratories?

During the hearing Mr. Friedman suggested that it might be “time to rethink the number of laboratories” or look into “consolidation” of the 16 research centers. Is DOE examining this question, and if so can you share details of DOE’s thoughts so far?

- A6.** DOE, through the leadership of its Office of Science (SC) and National Nuclear Security Administration (NNSA), has actively worked to reshape the relationship between national laboratories, sites and headquarters, including enacting a series of management reforms to improve operations and reduce costs; and maintain a safe, secure, and responsible security posture for our sites. Together, SC and NNSA participate in the National Laboratory Director’s Council, which examines ways to eliminate obsolete requirements. SC, NNSA, and contractors are working together to have a better understanding of what is driving up costs at the laboratories and sites and what the contractors are doing to mitigate these costs to ensure that every possible dollar is available for mission work.

For example, SC annually runs a strategic planning process for its laboratories to review the status and health of each of their assigned capabilities, to identify capabilities that DOE no longer needs, and to ensure that the laboratories’ plans for the future put them on the path for continued stewardship of the capabilities DOE does need in the future. The planning process includes input from and participation by all major customers at the laboratories, including the DOE applied energy programs, SC, NNSA, and other federal agencies. In FY12, DOE is expanding the SC process and including the three

laboratories under the purview of the DOE applied energy programs. In addition to the reviews of the laboratories' capabilities, DOE also uses the planning process to anticipate laboratories' infrastructure and other resource needs, what is required to keep them "mission-ready," and their costs of doing business. In several cases, DOE has found that the laboratories' efforts to streamline support costs and to use strategic sourcing, where appropriate, to leverage the buying power across multiple laboratories has led to reductions in their indirect costs. DOE is actively encouraging these and similar cost saving activities across the national laboratories to the benefit of the complex.

In addition to corporate planning activities, at least once every five years, DOE and NNSA review and validate the continuing need and adherence to mission for each Federally Funded Research and Development Centers (FFRDC). These reviews are conducted in accordance with the requirements and criteria set in the Federal Acquisition Regulations (FAR) 35.017 and they encompass an assessment of the Department's needs and mission requirements performed by the FFRDC, whether or not an FFRDC is still the appropriate vehicle for the Department to use to meet those needs, and the efficiency and cost-effectiveness of the FFRDC's operation.

For NNSA, the Administrator has also created a policy entitled "Transformational Governance and Oversight" which defines principles, responsibilities, processes and requirements to help in transforming and improving governance and oversight, and reducing contractor costs.

First, NNSA is in the final stages of a contract competition which consolidates the Y-12 National Security Complex and the Pantex Plant M&O, with an option for the Savannah River Site Tritium Operations, to achieve more efficient and effective operations while improving mission performance. As part of this consolidation process, NNSA benchmarked private industry and developed models for reduction based on industry standards. Overall consolidation analysis estimates potential savings to be approximately \$895M over a 10-year period, including reductions in administrative, overhead, and indirect costs.

Second, due to the growing importance of achieving efficiency across NNSA's nuclear weapons complex, NNSA created a new Associate Administrator position for Infrastructure and Operations with a primary focus on execution of M&O management and oversight. This office will integrate and align common business processes, increasing consistency in the implementation of M&O oversight activities, and will review whether certain current functions performed at individual site offices can be consolidated. These actions are expected to streamline key oversight activities and reduce the overhead burden on the M&O.

NNSA continues to examine additional ways to consolidate functions, reduce costs, while executing mission effectively. For example, NNSA is working with its laboratories, such as Sandia National Laboratory, to implement a new healthcare plan that reduces long-term liability while producing a projected \$3M in savings the first year.

#### **QUESTION FROM REPRESENTATIVE STEARNS**

- Q7. According to the report, the Department of Energy (DOE) spends \$700 million for protective force staffed by contractors to secure its nuclear and defense-related facilities. The procurement of these services uses three arrangements which lack uniformity and consistency and result in 25 separate contract instruments. What savings can DOE obtain by restructuring the way it procures its protective force support?**
- A7. The savings DOE can obtain by restructuring the way it procures its protective force support will be largely determined by the manner in which the procurements are restructured. All three security contracting models currently in place throughout DOE and NNSA (included within the management and operating [M&O] contract; separate prime contracts; and subcontracts) have, at times worked to provide acceptable security performance. However, as the Y-12 incursion on 28 July 2012 clearly demonstrated, some models may introduce more weaknesses than others.**

**Although NNSA has not yet conducted detailed analysis or produced estimates of the savings possible by restructuring its other protective force contracts, and cannot therefore quantify them at this time, work in this area is ongoing and NNSA believes further efficiencies will be possible. While the ultimate goal is and remains the security of these important facilities, achieving uniformity and consistency, to the extent practical, in contract model and type is being pursued. NNSA will also continue to encourage consolidation where operationally feasible, consistent with larger mission priorities.**



## QUESTION FROM CONGRESSMAN STEARNS

- Q8.** Concerning the Weatherization Assistance Program, OIG issued a Management Alert in 2009. In 2010, the DOE IG issued a further report noting that their “testing revealed substandard performance in weatherization workmanship, initial home assessments, and contractor billing. These problems were of such significance they put the integrity of the entire Program at risk.”
- a.** Why did DOE take no actions earlier considering that the IG kept warning DOE about the Program?

**A8a.** The Department of Energy’s (DOE) Weatherization Assistance Program (WAP) has helped more than one million low-income families nationwide using funds from the American Recovery and Reinvestment Act (ARRA) of 2009 as well as regularly appropriated DOE funds.. This figure far exceeds the original target of 600,000 homes under ARRA. These retrofits improve the energy efficiency of their homes and help them save money on their energy bills. Families save between \$250 and \$450 per year depending on housing type, fuel source, and location as a result of the program.

DOE takes a reported case of poor performance in WAP very seriously, but the cases of poor performance have been the exception rather than the rule. As part of DOE’s ongoing quality-control process, the Department has pro-actively sought to find and fix problems. That is why the Department has built in multiple levels of oversight into WAP—including local inspectors, the states, DOE project officers, technical assistance contractors, and the Inspector General.

WAP administered funding from ARRA to weatherize low income homes. This funding has been the subject of 28 audits covering grantees representing 78% of the Recovery Act portfolio. These audits were conducted by the DOE Office of Inspector General (OIG) and the Government

Accountability Office (GAO). Of the 28 audits, 17 are complete and 11 are ongoing. The majority of the completed audit reports (14 of 17) contained no significant findings. Of the remaining three reports, findings included evidence of substandard performance in workmanship, initial home assessments, contractor billing, financial management, and compliance with laws and regulations, including Davis-Bacon and Historic Preservation issues.

It is also important to note that as part of the DOE's guidelines, there are three types of issues that are classified as impacting the quality of the services (1) Missed opportunities where additional services could have been installed but were not; (2) Instances where services were installed but should not have been; and (3) Poor quality installation of materials. Nationwide, only three percent of homes have had any of the three issues identified, including homes where more could have been done.

Upon notification from the Inspector General (IG) of issues discovered during audits and reviews, DOE has always taken immediate action within the WAP. While not specifically mentioned in the question, it appears that Congressman Stearns is referencing the DOE IG's **"Management Alert on the Department's Monitoring of the Weatherization Assistance Program in the State of Illinois"** issued in December 2009 and the IG Audit Report entitled **"State of Illinois Weatherization Assistance Program"** issued in October 2010.

The Management Alert issued in 2009 referred to the monitoring of local WAP operations by the state and the inspection process used by local agencies and state officials to determine if quality deficiencies exist after the work is complete. The Report also stated that the State must perform

its required oversight on each local agency under contract and that DOE must complete its required monitoring of grantee activities as well.

The Management Alert contained several findings and recommendations related to these issues. In all cases, the state WAP office and DOE concurred with the IG findings as noted in the DOE Management Response to the Report. In addressing the oversight of the Community and Economic Development Association (CEDA) of Cook County, Illinois, DOE staff:

- Stipulated that quarterly onsite monitoring including oversight activities to address these findings must occur. The first visit to Illinois occurred in November 2009 when the draft Management Alert was issued. This visit addressed the quality issues and inspection requirements referred to in the Report and the actions to be taken by the State to remedy the lapse in quality assurance.
- Communicated monitoring and inspection requirements within six weeks of issuance of the Alert (on 1/15/10) providing WAP Program Notices to all grantees specifically stating the oversight by the grantee of every subgrantee each year, and the inspection of at least five percent of each grantees' completions. Grantees were required to acknowledge this requirement after receipt of the Notice via an email to their Project Officer.
- Conducted a second site visit with the State of Illinois in April 2010 and reviewed the progress made by the State in implementing their monitoring procedures and tracking system. This visit also confirmed that special conditions were placed on CEDA for production and quality improvement. The State assigned two inspectors to CEDA to

review 100% of production until all remedial actions were taken regarding quality and accountability.

- Conducted a third monitoring visit in August 2010 as a follow-up to activity reports provided by the State to ensure progress was being made in WAP operations. CEDA failure rate was reduced from 55% to 25% and accountability had improved; however, special conditions remained in place and the State continued its inspection procedures.

At the same time that DOE was monitoring the WAP activities for the State of Illinois and CEDA, the Department was making significant improvements in its operating procedures. For example, DOE:

- Directed additional resources (22 DOE staff) to manage ARRA grants and implement the Department's Monitoring Plan. In addition DOE had the Institute for Building Technology and Safety (IBTS) conduct nearly 30,000 random quality assurance visits throughout the WAP network.
- Ensured that all DOE Project Officers utilize DOE's existing tracking system to record monitoring findings including monitoring the report checklists that Project Officers use in the field to track follow-up actions taken by grantees to resolve findings.
- Provided regular review of grantees' training plans and performed on-going tracking of their plans during routine monitoring or desk auditing as an on-going procedure of grants management.
- Released 12 Weatherization Program Notices in 2009 covering various aspects of WAP operations including updated grant guidance; fund distribution; clarifying monitoring requirements; Davis-Bacon Prevailing Wage use and recordkeeping; the National WAP

Evaluation requirements; and many other topics. This was followed-up in 2010 with 19 separate guidance documents to further clarify rules, regulations and policies governing the WAP (see attachment entitled “Weatherization Program Notices and Guidance”).

The second IG report, concerning the Weatherization Program in the State of Illinois was issued October 2010 and provided a detailed audit of the Community Economic and Development Corporation of Cook County, Illinois (CEDA), the subgrantee for Chicago. The October 2010 report revealed that serious material deficiencies with the work quality and accountability of resources still existed in this subgrantee. In addition, CEDA failed to use proper management controls in conducting its oversight of contractor use and billing. The State inspectors continued to find work quality and accountability errors after the homes were weatherized and reported as completions.

In the October report, the IG indicated that several actions were adopted by DOE and the State to resolve the issues contained in the Management Alert and that “these efforts are positive first steps.” During the ten months between the Management Alert and the Audit Report, both the State and CEDA did make progress and continue to improve operations. Unfortunately, the steps taken by the State and CEDA remained insufficient to address all of the issues referenced in the October 2010 IG audit.

In September 2012 the DOE IG began a criminal investigation involving CEDA that is ongoing. It is WAP’s normal operating procedure to not intervene or conduct monitoring while such an

investigation is underway unless requested by the IG. The DOE WAP has not been requested to take any actions at this time.

The State continues to monitor the situation and has monitors assigned specifically to CEDA. Approximately 15% of their production is reviewed by these staff – nearly three times the minimum requirement of DOE. The State also conducts random follow-up inspections of work that failed to be accepted during the initial review.

The WAP Project Officer receives copies of these reports and reviews them for continuity and any follow-up activities required. Throughout 2011, State staff conducted monitoring of field operations twice a month – reviewing production quality and file documentation. In 2012, the frequency was changed to monthly due to improvements noted in monitoring findings. These reports are retained at the grantee's office and are reviewed when Project Officers conduct on-site visits.

When the investigation is cleared, DOE WAP staff will resume its review of CEDA. DOE performed monitoring of all WAP grantees at least twice a year throughout 2010 and 2011. These monitoring visits include a review of the grantees' programmatic and grants management activities related to their approved State Plan. Project Officers also visit select subgrantees to ensure that grantee monitoring is being performed and quality control inspections are conducted at a sufficient rate.

## QUESTION FROM CONGRESSMAN STEARNS

**Q9.** In its 2012 report, “Opportunities to Reduce Duplication, Overlap and Fragmentation, Achieve Savings, and Engage Revenue,” (GAO-12-342SP), GAO notes that there are fourteen grant and loan programs at DOE, Department of Transportation (DOT), and the Environmental Protection Agency (EPA) that have the effect of reducing mobile source diesel emissions, and that “enhanced collaboration and performance measurement could improve these fragmented and overlapping programs.”

- a.** What actions, if any, has DOE taken to identify and then reduce fragmentation and overlap across its programs aimed at reducing mobile source diesel emissions, including Clean Cities, Energy Efficiency and Conservation Block Grants, and the State Energy Program?

**A9a.** DOE has implemented several mechanisms to improve coordination across programs. For example, Clean Cities provides technical staff to the Energy Efficiency and Conservation Block Grant (EECBG) Solution Center, enhancing collaboration as well as leveraging resources and expertise. The programs are also planning joint webinars to inform EECBG stakeholders of information resources already available through Clean Cities and encourage coordination of efforts at the local level. This is particularly important as many Clean Cities coalition coordinators are located in or have strong ties to State Energy Offices and other programs involved in the State Energy Program or EECBG projects.

## QUESTION FROM CONGRESSMAN STEARNS

**Q9.** In its 2012 report, “Opportunities to Reduce Duplication, Overlap and Fragmentation, Achieve Savings, and Enhance Revenue,” (GAO-12-342SP), GAO notes that there are fourteen grant and loan programs at DOE, Department of Transportation (DOT), and the Environmental Protection Agency (EPA) that have the effect of reducing mobile source diesel emissions, and that “enhanced collaboration and performance measurement could improve these fragmented and overlapping programs.”

**b.** How has DOE coordinated its efforts with DOT and EPA?

**A9b.** DOE has implemented a number of mechanisms to enhance coordination, leverage resources and expertise to the greatest extent possible, and eliminate the potential for overlapping or duplicative efforts. Examples of regular and ongoing coordination activity include the following:

- DOE and DOT hold monthly coordination meetings focused on specific topics within areas of mutual interest, including diesel emission reduction efforts and projects such as Super Truck, as well as vehicle electrification, codes and standards, lightweighting, and fuel economy regulations.
- Both EPA and DOT participate in the 21<sup>st</sup> Century Truck Partnership, DOE’s cooperative research partnership with industry focused on advancing the development of fuel-efficient technologies for heavy-duty vehicles. EPA and DOT also participate on various technical teams in the U.S. DRIVE Partnership, DOE’s cooperative research partnership with industry focused on advanced technologies for light-duty vehicles.
- Both EPA and DOT staff serve as technical expert reviewers at DOE’s Vehicle Technologies Program Annual Merit Review – their participation not only leverages their technical expertise as independent merit reviewers but also ensures DOT and EPA staff understand DOE strategy as well as individual project efforts. Similarly, EPA and DOT



staff participates in DOE's annual Directions in Energy-efficiency and Emissions Research (DEER) meeting, during which DOE-funded project leads share their progress on developing high-efficiency, low-emissions diesel and gasoline engines.

- DOE participates in EPA's Mobile Source Technical Review Committee, which meets twice annually.
- Through its Clean Cities initiative, DOE staff communicates with local community leaders on a monthly basis – they use this opportunity to emphasize the importance of working closely with EPA-supported Regional Diesel Collaboratives.

In addition to regular coordination, DOE is collaborating with the agencies on specific projects.

As an example, DOE and EPA have joined the Engine Manufacturers Association, California Air Resources Board, American Petroleum Institute, Coordinating Research Council, and a variety of after-treatment manufacturers to perform a multi-year study to characterize emissions and possible health impacts of new, advanced fuels and heavy-duty engine and control systems.

## QUESTION FROM CONGRESSMAN STEARNS

**Q9.** In its 2012 report, "Opportunities to Reduce Duplication, Overlap and Fragmentation, Achieve Savings, and Enhance Revenue," (GAO-12-342SP), GAO notes that there are fourteen grant and loan programs at DOE, Department of Transportation (DOT), and the Environmental Protection Agency (EPA) that have the effect of reducing mobile source diesel emissions, and that "enhanced collaboration and performance measurement could improve these fragmented and overlapping programs."

**c.** Are preliminary estimates available on the amount of savings to be obtained through such efforts?

**A9c.** Though no preliminary estimates are available, DOE is committed to using tax-payer dollars in the most effective and efficient way possible. In order to best support innovation and prosperity in the United States, the Department will continually work to address duplicative efforts and protect taxpayer investments.

QUESTION FROM REPRESENTATIVE BARTON

Q1. Please provide the Committee with the total amount DOE spent on travel in Fiscal Year 2011.

A1. The Department reported \$59,752,994.79 on foreign and domestic travel for federal employees in Fiscal Year 2011. This does not include domestic or foreign travel costs for contractor travel reimbursed by DOE. The Department does not have systems to track its total federal and contractor employees' travel cost and is working on a data call so that it can submit complete information to the Committee as soon as possible.

A recent DOE IG Management Alert (<http://energy.gov/ig/downloads/departments-energys-management-foreign-travel>) identified \$59,430,495 in contractor foreign travel costs in FY 2011.



## Department of Energy

Washington, DC 20585

December 21, 2012

The Honorable Jeff Bingaman  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On February 16, 2012, Secretary Steven Chu testified regarding the Department of Energy's budget for fiscal year 2013.

Enclosed are the answers to 167 questions that were submitted by Ranking Member Murkowski, Senators Johnson, Barrasso, Wyden, Cantwell, Coons, Shaheen, Udall, Risch, and you for the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in dark ink, appearing to read "Jeff Lane", is written over a faint, larger signature that is partially obscured.

Jeff Lane  
Assistant Secretary  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Lisa Murkowski, Ranking Member



## **QUESTION FROM CHAIRMAN BINGAMAN**

### **R&D Questions**

**Q1. Quadrennial Technology Review—the DOE completed the first Quadrennial Technology Review in September 2011.**

- a. Can you explain how the QTR has influenced the FY2013 DOE budget? Please provide specific examples of programs that received increased or decreased funding based on the recommendations or findings of the QTR.**
- b. Please comment on the usefulness of the QTR in informing tough budget decisions or providing justification for various projects.**

**A1a. The Department's first QTR provided a framework and principles for planning and budgeting for technology development efforts across the Department's Energy and Science programs. For example, in FY2013, EERE has requested a budget that is consistent with the recommendations of the QTR, rebalancing priorities from mature technologies, such as onshore wind, distributed fuel cells, and conventional hydropower to support the development of newer, advanced technologies, such as off-shore wind and computational modeling of complex environments (coupling of wind and sea states and complex terrain). Additionally, EERE has shifted its investments in the mature, market-ready geothermal heat pump technologies away from technology development in the geothermal program to systems integration in the Buildings Program. The Biomass program is focusing further program shifts to drop-in hydrocarbons.**

**A1b. The DOE-QTR has proven to be a valuable process, leading to a robust framework for the Department's energy programs, as well as principles by which to establish multiyear program plans. These principles are useful in helping the Department judge the priorities of various technology efforts, and guide the budget process in determining priorities.**

## **QUESTION FROM CHAIRMAN BINGAMAN**

### **High Performance Computing**

I am a strong supporter of the DOE's exascale initiative to further develop high performance computing. In 2011 I championed a letter, signed by 24 senators from both sides of the aisle, asking the Administration to support the exascale initiative. I see in the Office of Science (SC) budget that Advanced Scientific Computing Research is funded at \$455 million, an increase of 3.3%. Exascale has also been funded through the National Nuclear Security Administration (NNSA) in recent years' budgets. There is no specific line in either budget for the exascale initiative.

**Q2 (a):** In FY 2013, what fraction of this funding is available for the exascale program? Please provide the budgeted amount for the exascale initiative both from the SC budget and from the NNSA budget.

**A2 (a):** Thank you for your continued support of the Department's exascale efforts.

In the FY 2013 NNSA budget request, \$48.6 million is for activities that contribute to high performance computing advancements directly supporting NNSA's stockpile stewardship mission but that NNSA considers relevant to the Department's efforts toward exascale.

In the FY 2013 SC budget for Advanced Scientific Computing Research, \$68.5 million, will be spent on exascale activities including Research and Evaluation Prototypes partnerships with industry for advancing critical technologies for Exascale, Computer Science research in software environments, Applied Mathematics research in uncertainty quantification, and co-design efforts in Computational Partnerships. If FY 2013, funding for hardware research will focus on R&D in breakthrough technologies that will enable novel hardware designs for Exascale computing with priority given to early-stage technology development.

## **QUESTION FROM CHAIRMAN BINGAMAN**

**Q2 (b):** The Chinese and Japanese are investing heavily in high performance computing and the race to exascale capability. Is the DOE still on track to achieve exascale by the end of the decade and does the budgetary commitment for exascale put us in a competitive position?

**A2 (b):** The DOE exascale initiative is about enabling certain science and engineering capabilities that we believe will advance the DOE missions and U.S. competitiveness in important areas. This goal has a number of critical milestones that must be achieved along the way. For example, to deliver more advanced computing capabilities, we must significantly reduce the power requirements of computing hardware. Achieving our goals for power reduction will have a significant positive impact throughout the IT sector of our economy and will be particularly important for scientific computing as tomorrow's departmental machines have today's supercomputers' capabilities. Equally important are our investments in applications, software and tools that will open high performance computing to even more research communities. With or without a machine that executes a billion billion operations per second, the investments the Department is proposing in the FY 2013 budget request advance the competitive position of the United States. We believe that the partnership between the NNSA and the Office of Science, with a balance between near-term and long-term efforts, is the right approach.

## **QUESTION FROM CHAIRMAN BINGAMAN**

**Small Modular Reactors** – For Fiscal Year 2013, the Department continues its program to work with industry to help license small modular reactors.

**Q3a.** How long does the Department believe it will take to successfully license these designs before the NRC?

**A3a.** The Department will soon be releasing a funding opportunity announcement (FOA) for cost-shared industry partnerships with SMR vendor and licensee teams for technical support for two SMR designs. The current domestic SMR vendors are expected to submit DC applications in the 2013-2014 timeframe, implying that certification can be completed in 4-5 years. Utility operating licenses will be submitted and completed concurrently in this timeframe. However, the actual licensing schedule will be highly dependent on the quality of the application, the extent of safety issues that surface during the review, and the resources that the NRC is able to commit to these reviews.



### **QUESTION FROM CHAIRMAN BINGAMAN**

**Q3b. What progress toward SMR's has been made to date?**

**A3b. The Department received its FY12 budget for the SMR Licensing Technical Support program in December 2011. A draft SMR FOA was issued for comment in January 2012 to ensure industry understanding of and involvement in the procurement process. Under the current schedule, the Department expects to issue the final FOA at the end of March 2012, conduct a merit review and selection process during summer 2012, and announce award selections by September 2012. The Department is committed to reducing the time required to fund these awards, if possible. Once underway, we expect the financial assistance provided by this program to provide noticeable acceleration in the licensing processes for the selected projects.**

**DOE is also providing funding for Advanced SMR R&D that is intended to improve the commercialization potential of SMR designs with longer licensing horizons. DOE is taking a deliberate approach to identifying a R&D portfolio that will address SMR-specific issues in areas like instrumentation and control, thermal hydraulics under natural circulation conditions, probabilistic risk assessment for the unique operating characteristics of SMRs, and other areas where there are pronounced technology gaps.**

## **QUESTION FROM CHAIRMAN BINGAMAN**

**Q4: Innovation Hubs –** The Department is proposing the addition of a new innovation hub in electricity systems.

Please explain what this hub will add to the Department.

**A4:** The Hub will serve as a focal point for many grid activities at the Department. It will establish a platform to test and evaluate innovative grid technologies and concepts on real electricity systems. The types of topics addressed through the Electricity Systems Hub are different from those that have been addressed through the Department's other Hubs, in that conditions and system needs vary throughout the country and must be incorporated into national solutions. In light of this particular challenge, two or three regional hubs rather than one single larger hub may be pursued to address the complex regional and local issues associated with grid modernization. By understanding the unique demands of each region, we can identify the needs common to all, and develop solutions that apply nationwide but accommodate local differences.

Key stakeholders can convene at the Hub to observe, discuss, and understand the market, regulatory, and institutional implication of these advancements. It will be a leader in transforming our Nation's power system and serve as a center of excellence for sharing information and best practices.

## **QUESTION FROM CHAIRMAN BINGAMAN**

### **Technology Transfer**

We hear a lot about the technology “valley of death” and I understand that the DOE has a new program, Agreements for Commercializing Technology or ACT, to try to bridge this gap.

**Q5 (a):** Can you describe how this initiative differs from other DOE methods of Technology Transfer?

**A5 (a):** The Agreement for Commercializing Technology (ACT) was proposed based on responses and recommendations received from industry to a 2009 Request for Information (RFI). The RFI provided stakeholders, including the private sector and other government entities, an opportunity to comment on the Departments best practices for technology transfer. DOE is piloting a new contractual mechanism to address many of the concerns and recommendations raised by the respondents.

While the general parameters of this proposal would allow greater latitude to M&O contractors for entering into Work for Others (WFO) with outside entities, we are continuing to develop the specifics of this proposal in a manner that will protect taxpayer interests.

## **QUESTION FROM CHAIRMAN BINGAMAN**

**Q5 (b): Can you talk a little bit about overall DOE efforts to move products from the Department to the market?**

**A5 (b): DOE works with the private sector to facilitate industry in its efforts to move technology to market. DOE's objective in the area of technology transfer and commercialization is to facilitate the transfer of laboratory research to the marketplace as quickly and efficiently as possible. To this end, we are working to reduce the actual and perceived barriers to licensing.**

**DOE is aggressively examining licensing practices to attract and facilitate work with both large and small companies. DOE plans to introduce SBIR-Technology Transfer, which would be a subset of the larger SBIR program. This model was spearheaded by NIST and aims to mature technologies developed at the laboratories. A laboratory will identify a technology along with the corresponding patent portfolio, which will be proposed for funding through an SBIR call. Small companies will be invited to submit their commercialization plans for technologies selected.**

### **QUESTION FROM CHAIRMAN BINGAMAN**

**Q6. Uranium re-enrichment** – Mr. Secretary, what are the DOE's current plans with respect to re-enrichment of depleted uranium from the existing stockpile?

**A6.** The Department has been working diligently to determine the best options and potential agreements with private industry partners with respect to our depleted uranium inventory with highest uranium assay. DOE is committed to working with the Congress as we evaluate alternatives that are beneficial to both the Department's missions and our fiduciary responsibility to the taxpayers.

## **QUESTION FROM CHAIRMAN BINGAMAN**

### **New Mexico Issues**

**Q7. Chemistry and Metallurgy Replacement Nuclear Facility at Los Alamos Laboratory—Secretary Chu, during the hearing you talked a bit about the Department's plans to put the Chemistry and Metallurgy nuclear facility on hold.**

- a. Can you describe what changes in operations and staffing you anticipate at Los Alamos now that the CMRR has been delayed?**

**A7a. The decision to defer construction of the CMRR Nuclear Facility (NF) for at least five years and to meet DoD long-term pit production needs requires NNSA to adjust its plutonium strategy by using existing infrastructure to provide for the capabilities originally planned for the CMRR-NF. Over the next several weeks, NNSA will be working with key officials at Los Alamos to identify plans to close out design activities for the CMRR-NF and modify our plutonium strategy to meet the needs of the nation's deterrent. While details of our plutonium strategy continue to develop, initial efforts focus on optimizing analytical chemistry activities in the Radiological Laboratory/Utility/Office Building (RLUOB) and using the Plutonium Facility (PF)-4 for some materials characterization workload. Impacts to staffing are pending Los Alamos Laboratory assessments on the technical and scientific expertise required to maintain its scientific and national security mission in support of the stockpile and required to support the safe and secure execution of the additional capabilities planned and needed for the RLUOB and the PF-4.**

### **QUESTION FROM CHAIRMAN BINGAMAN**

- b. Will additional funding for Los Alamos be needed to maintain adequate support to the complex?**
- A7b. After evaluating the laboratory's proposal on how to address the CMRR-NF deferred capabilities using existing infrastructure, the NNSA will have a better understanding of future funding requirements. In the interim, NNSA requested an additional \$35M for FY2013 for Los Alamos to accelerate actions necessary to process, pack, and ship excess material out of the PF-4 vault. The Administrator and the head of NNSA's Office of Defense Programs have made it clear that NNSA intends to work closely with Congress to ensure appropriated resources can be applied to near term alternatives to deliver required plutonium support functions at Los Alamos.**

## **QUESTION FROM CHAIRMAN BINGAMAN**

### **Advanced Manufacturing**

- Q8.** What are the goals of the new Advanced Manufacturing Office? (previously the Industrial Technologies Program)
- a.** Some manufacturers are concerned that DOE will not be able to continue to provide near term assistance for small to medium sized manufacturers – please address this concern.

**A8a.** The Advanced Manufacturing Office (AMO) is focused on creating a fertile innovation environment for advanced manufacturing, enabling vigorous domestic development of new energy-efficient manufacturing processes and materials technologies to reduce the energy intensity and life-cycle energy consumption of manufactured products, and promoting a collaborative infrastructure around targeted technical areas that will facilitate the development and scale-up of energy efficient manufacturing technologies. AMO also supports U.S. manufacturers through technology deployment efforts targeted to help those manufacturers overcome specific barriers to adoption of energy efficient technologies and best energy management practices as a path to strengthen their global competitiveness.

As part of its deployment activities, AMO will continue to provide immediate assistance to small and medium-sized enterprise (SME) manufacturers through its ongoing support for the Industrial Assessment Centers, which provide students with critical skills and training to conduct energy assessments in a broad range of facilities, while producing real cost savings for small to mid-size manufacturers. AMO will also help SMEs by preparing and updating a variety of other energy efficiency software tools, training, and guidance materials that SME customers can effectively apply to find energy savings.



## **QUESTION FROM CHAIRMAN BINGAMAN**

- Q8. What are the goals of the new Advanced Manufacturing Office? (previously the Industrial Technologies Program)**
- b. Is DOE committed to continuing the Industrial Assessments Centers and Clean Energy Application Centers?**
- A8b. The Advanced Manufacturing Office is committed to continuing the Industrial Assessment Centers (IACs) as part of its work to help manufacturers overcome specific barriers to adoption of energy efficient technologies and strengthen their global competitiveness. In September, 2011, as part of a competitive funding process, AMO selected a new group of 24 IACs located across the country to carry on and enhance the work of the program.**

**DOE will also continue to support the Clean Energy Application Centers (CEACs) that provide outreach and technology deployment expertise to industry stakeholders as a strategy to accelerate the adoption of clean energy technologies including, principally, CHP under the funds requested for Industrial Technical Assistance (\$31 Million).**

## **QUESTION FROM CHAIRMAN BINGAMAN**

**Q9. The recent Innovative Manufacturing Initiative funding opportunity through the Advanced Manufacturing Program received 1400 letters of intent of which 78% were small companies of less than 500 employees. As I understand it, the initiative requires a cost share from industry partners. The successful call showed that industry partners were willing to shoulder \$4.3 billion in leveraged funding to develop innovative manufacturing processes and materials, which indicates there is an appetite for increased partnerships between government and small businesses to revitalize manufacturing in the United States. How much of the Advanced Manufacturing Program requested budget is allocated to the Innovative Manufacturing Initiative in 2013 and are there any similar leveraged partnership programs within DOE that you would like to highlight?**

**A9. The Advanced Manufacturing Office (AMO) plans to allocate \$25 million from its FY 2011 funds to support projects selected through the Innovative Manufacturing Initiative (IMI) funding opportunity during 2012. Funding provided through the IMI solicitation is to extend over three years to help develop transformational manufacturing technologies and innovative materials that can reduce time, cost, and energy requirements associated with manufacturing. AMO's plan is to spend \$50 million in support of IMI projects in FY 2013.**

**All solicitations put out by AMO are designed to require significant cost share depending upon the technology readiness level of the project. AMO views the cost share as an important requirement to encourage leveraged partnerships.**

### **QUESTION FROM CHAIRMAN BINGAMAN**

- Q10.** The return on investment in Combined Heat and Power Technology has been impressive. For example, a DOE investment of approximately \$12 million at Caterpillar resulted in an estimated \$3.0 – \$4.0 Billion in sales and 44% improvement in energy efficiency. Of the \$290 million requested for the Advanced Manufacturing Program, how much of that is allocated to developing CHP technology and does this represent an increase or decrease from 2012 enacted levels?
- A10.** The Advanced Manufacturing Office (AMO) is committed to supporting Combined Heat and Power projects in its portfolio so long as these projects continue to meet their technical milestones and overall AMO objectives. Existing CHP R&D projects and new CHP R&D activities will be supported through the funds requested for Next Generation Manufacturing Processes \$198 million. Funding levels for AMO's CHP projects included in the 2013 budget request will be similar to 2012 levels, as long as the projects demonstrate satisfactory progress and continue to support AMO's core objectives. The Clean Energy Application Centers (CEACs) provide technical assistance, education and outreach, and market development support to industry stakeholders as a strategy to accelerate the adoption of clean energy technologies including, principally, CHP. The CEACs will be supported under the funds requested for Industrial Technical Assistance (\$31 Million). The CEACs will also be supported at a level similar to FY12.

## **QUESTION FROM CHAIRMAN BINGAMAN**

### **Fossil Research and Development**

**Q11. The President's budget has an increase in the Fossil Energy research and development over the last fiscal year– with much of the focus on carbon capture and sequestration technologies, as well as the safe and environmental exploration and production of unconventional shale gas plays, such as the Marcellus. Please describe a bit more how the Department is spending the funding in this area and how it will leverage the work that the other agencies are conducting on the same areas of research and regulatory development – including the EPA and the Department of the Interior.**

**A11. DOE's FY 2013 Natural Gas budget request for shale gas will focus on high priority research recommendations received from the Subcommittee of the Secretary of Energy Advisory Board (SEAB). On April 13, 2012 DOE, the Environmental Protection Agency, and the Department of the Interior's U.S. Geological Survey signed a Memorandum of Agreement formalizing this Multi-Agency Collaboration on Unconventional Oil and Gas Research. Through this collaboration, a robust Federal R&D plan is being developed, taking into account the recommendations of the Secretary of Energy Advisory Board (SEAB) Natural Gas Subcommittee. DOE's role in this initiative will focus on priorities identified by the interagency collaboration in a research plan to be formed over the next nine months within its area of core research competencies, including wellbore integrity, flow and control; green technologies; and systems engineering, imaging and materials.**

## **QUESTION FROM CHAIRMAN BINGAMAN**

### **Fossil Research and Development**

- Q12.** There are several rescissions cited in the FE budget overview – from the FE R&D program—most notably in the area of ultra-deepwater and unconventional natural gas. In the detailed budget - there is a budgetary request of \$17 million for FY 2013 for the natural gas program, while the ultra-deepwater unconventional natural gas program appears to be cancelled altogether. I ask this because the Secretary of Energy's Advisory Board Subcommittee on Shale Gas proposed making greater investments into studies, as well as R&D for safe, responsible shale gas extraction. The \$17 million that is requested appears to pay for natural gas technologies (at \$12million), as well as \$5 million for a methane hydrates field test, which is a cut of 50% from the previous fiscal year. That seems like an extremely modest investment for trying to address the range of environmental and human health and safety issues that shale gas production has generated and the challenges associated with methane hydrate extraction. Can you explain why the whole \$50 million ultra-deepwater/unconventional natural gas program funding wasn't used to more properly address the issues around shale gas development, as well as other unconventional oil/gas production (such as shale oil like the Bakken formation in North Dakota)? That seems like it could fit well within the constraints of the existing program authorizations for the ultra-deepwater/unconventional program.
- A12.** EPACT Sec. 999 is too inflexible a mechanism to adequately address environmental and safety concerns in the dynamic and rapidly evolving hydraulic fracturing space. The 2013 Budget request focuses the natural gas program on a collaborative R&D effort with the Environmental Protection Agency and the Department of the Interior to understand and minimize the potential environmental, health, and safety impacts of natural gas development through hydraulic fracturing consistent with high priority recommendations of the Secretary of Energy Advisory Board.

## **QUESTION FROM CHAIRMAN BINGAMAN**

### **Energy Efficiency**

**Q13. FEMP is bringing back the Federal Energy Efficiency Fund at \$5 million in funding. What is the expected leverage of private sector and/or other agency funds for this \$5 million investment? (It is my understanding that in the 90s the Navy was able to leverage over 4 times their investment by using ESPCs.)**

**A13. Similar to the DOD's Energy Conservation and Investment Program (ECIP), through the Federal Energy Efficiency Fund (FEEF), FEMP would provide direct funding and leveraged cost-sharing for Federal civilian agencies for the most worthy capital projects and other initiatives with the greatest return on investment in order to increase the energy efficiency, water conservation and renewable energy investments at agency facilities. We expect that the leveraging of other civilian agency funds to DOE funds would be about one to one, and FEMP would include this expectation as well as consideration of other private sector leveraging, in our criteria for competitively awarding projects. In the two years that this program had spending authority (FY 1994 and FY 1995), grants of \$7.9 million were provided to 37 projects which leveraged \$3.6 million in Federal-agency funding and \$0.9 million in non-Federal funding.**

## **QUESTION FROM CHAIRMAN BINGAMAN**

**Q14.** There are a growing number of DOE and other programs that ask manufacturers or private owners of commercial buildings to commit to voluntary energy-saving targets or actions: at DOE alone these include Save Energy Now, Superior Energy Performance and “Global” Superior Energy Performance, and most recently Better Buildings/Better Plants. Prior to these, EPA has had the Energy Star for Buildings and Energy Star for Industry programs. And outside the government, the US Green Building Program’s LEED rating for Existing Buildings has a significant energy component. Does this create confusion in the market place, with multiple programs all vying for attention and commitment from the same private companies? What will DOE do, working with EPA and others, to reduce the apparent duplication and confusion?

**A14.** DOE recognizes the importance of reducing duplication and confusion in the marketplace and seeks to work with programs like LEED and Energy Star as partners, not competitors. That is why DOE has an MOU with EPA (available at: <http://www.energystar.gov/index.cfm?c=partners.mou>) recently updated in 2009, to clearly lay out plans (updated annually) for how we will work together, and to articulate these plans to our mutual partners. However, we also recognize that there is always room for improvement. This year, we intend to undertake a comprehensive evaluation of our energy efficiency partnership programs to determine where it makes sense to streamline and consolidate activities to make sure that the programs we support are efficient, robust, and making valuable contributions that complement—rather than duplicate—efforts underway elsewhere.

For the other DOE programs mentioned, they are each related to each other in a complementary manner. For instance, SEP (and GSEP, which is the international companion program) is a technical program that supports and aligns with Better Buildings, Better Plants Program, which is the overarching program (and has replaced Save Energy Now).

**Our role is to provide a technically sound, unbiased and transparent program that allows consumers a common comparison of results.**



## **QUESTION FROM CHAIRMAN BINGAMAN**

**Q15. With the initiation of the various Research Hubs, DOE's EERE program seems to be much more focused on R&D than on deployment issues. Can you please tell me whether and how much of a role DOE plans to play in deployment of Energy Efficiency technologies?**

**A15. EERE supports innovation that will allow U.S. manufacturers and U.S. workers to lead the race and secure the benefits of clean, energy efficient domestic energy systems as a foundation for a prosperous American future. EERE directs and manages a portfolio of activities, including research hubs, to foster and support technological solutions across the research and development (R&D) continuum, bridge gaps by increasing product performance and knowledge, and attract commercial resources necessary for commercialization at a convincing scale. EERE's portfolio includes strategic investments in research areas where risks and other factors stymie immediate private research investment or would otherwise not occur for many years, and areas where programs are developed to overcome market barriers to help important new technologies reach a point where private investment will be able to turn them into profitable business opportunities.**

**The primary mission of the Building Technologies Program (BTP) is to reduce building energy consumption in the U.S. through the development of advanced, innovative technologies; we will not be able to actually deliver those energy savings to U.S. consumers unless these products are used in the market, at scale. Therefore, the Program also supports market-priming measures to ensure that these technologies overcome the barriers to widespread adoption, such as first cost, the various building trades' understanding and then acceptance of new technology, and insufficient availability of**

credible and objective consumer information. BTP has a significant number of deployment related activities, including:

- **BetterBuildings Challenge** - The BetterBuildings Challenge will document successful models of increased investment in commercial building energy efficiency that improve efficiency by at least 20 percent by 2020.
- **High-performance Product Specifications and Markets** - DOE will work with commercial building stakeholders to identify and develop high-performance product specifications, and then use the Better Buildings Alliance, composed of companies and stakeholders, to stimulate and drive demand for advanced technologies identified as having large opportunities for energy savings.
- **Efficiency Benchmarks, Tools, and Databases** - The creation of reliable efficiency benchmarks, tools and databases to facilitate energy efficiency financing, technology deployment, and sustainable business models, and to define efficiency's value-add to consumers (BetterBuildings Residential and Commercial, Energy Star);
- **Energy Efficient Buildings Hub** - The creation of the Energy Efficient Buildings Hub in Pennsylvania to demonstrate the integration of advanced, energy efficient technologies, systems and techniques into buildings, and to facilitate their scale deployment into the market; and
- **Common Test Procedures** - Developing common test procedures (i.e., supporting both Energy Star and Federal Standards) and new standards for new energy consuming equipment and new buildings with continually updated equipment and

model building codes based on cost effective, higher performing technology that has been successfully commercialized.

Within EERE, the U.S. Department of Energy's Advanced Manufacturing Office (AMO) works specifically to support existing U.S. manufacturers through technology deployment efforts targeted to help manufacturers overcome specific barriers to adoption of energy efficient technologies and best practices as a path to strengthen their global competitiveness. AMO pursues this goal through a combination of education, recognition, and deployment expertise tailored to the particular challenges faced by manufacturers and the energy management industry. Included among these activities are:

- **Industrial Assessment Centers (IACs)** - A network of university-based, DOE-supported programs that conduct energy audits for small and medium size manufacturers while simultaneously training engineering students to help them become the next generation of energy management professionals.
- **Superior Energy Performance** - A market-based, American National Standards Institute (ANSI)-accredited energy management certification program that provides manufacturers and industrial facilities with a roadmap for achieving continual improvement in energy efficiency while maintaining competitiveness. The program provides a transparent, globally accepted system for verifying energy performance improvements and management practices, and also serves as an implementation of

the International Organization for Standardization (ISO) 50001 energy management system standard.

- **Clean Energy Regional Application Centers** – These centers provide outreach and technology assistance to industry stakeholders as a strategy to accelerate the adoption of clean energy technologies – principally combined heat and power (CHP) – helping manufacturers save energy and money.
- **The Better Buildings, Better Plants Challenge and Program** – This is a national partnership program that aims to drive a 25% reduction in industrial energy intensity over 10 years in order to improve energy efficiency and enhance the overall competitiveness of the U.S. manufacturing sector. These public/private partnerships will also help to create energy efficiency oriented American jobs as companies execute energy saving programs, implement technologies, and share best practices as part of their corporate commitment to the program.

### **QUESTION FROM CHAIRMAN BINGAMAN**

**Q16. DOE and OMB have recently begun missing legal deadlines for appliance and equipment efficiency standard rulemakings. Can you tell us what the problems are and what you are doing to catch up so that all rulemakings can get back on track?**

**A16. The passage of EISA 2007 substantially increased the workload of the Appliance Standards Program, adding new statutory obligations to the initial multi-year rulemaking schedule in the January 31, 2006, report to Congress. Since EISA 2007 established an aggressive schedule for completing these additional rulemakings, DOE is working on many more contemporaneous rulemaking proceedings than had been contemplated at the time of the initial report to Congress.**

Since publication of the initial report, DOE has issued efficiency standard final rules for 21 of the 22 original backlogged products and completed a determination for the remaining product. Consequently, all the actions required by the consolidated consent decree in *State of New York, et al. v. Bodman and NRDC, Inc., et al. v Bodman* have been completed. Yet the coincident requirements of the backlog and EISA 2007 strained the standards review and approval process. While DOE met all of its obligations with respect to the consent decree, DOE has missed several deadlines codified in EISA 2007. These rulemakings are priorities for completion, and DOE remains committed to complying with all applicable deadlines. As a result, DOE has further streamlined standards and test procedure reviews and approvals, and is building additional program capacity. DOE is also working closely with the Office of Management and Budget (OMB) to review key rulemaking documents, such as notices of proposed rulemaking

(NOPRs) and final rules. The department will continue to monitor and seek to improve the rulemaking review and approval process so as to meet all rulemaking requirements.

### **QUESTION FROM CHAIRMAN BINGAMAN**

**Q17. This budget includes some significant increases for energy efficiency programs. How does energy efficiency programmatic spending compare to other spending with regard to the economic benefits?**

**A17. Energy efficiency programs help American families, businesses, and government save money, reduce harmful emissions, as well as reduce energy consumption and our nation's reliance on oil.**

**For example, the FY2013 request makes a large investment into Advanced Manufacturing, which will support development of innovative energy-efficiency manufacturing processes that will reduce costs of manufacturing by using less energy while improving quality and accelerating product development. Additionally, with buildings representing 40 percent of the nation's energy consumption—costing over \$400 billion per year—DOE will make greater investments in partnership with the buildings industry to make buildings more efficient and affordable. DOE believes the energy costs from buildings could be reduced by 20-50 percent or more through a variety of energy efficiency approaches.**

**QUESTION FROM CHAIRMAN BINGAMAN**

**Q18. To what extent would the programs under the Office of Energy Efficiency and Renewable Energy (EERE) be impacted if tax and mandatory spending were not reformed, and the Fiscal Year 2013 sequestration were sustained?**

**A18. We urge Congress to enact balanced deficit reduction legislation that avoids sequestration as proposed in the President's Budget.**



### **QUESTION FROM CHAIRMAN BINGAMAN**

**Q19. How do energy efficiency initiatives/investments fit in the broader context of the ongoing debate to lower the deficit, strengthen the economy and create jobs?**

**A19. Investments in energy efficiency activities and initiatives provide some of the greatest economic benefits per dollar spent. EERE's efforts contribute to these economic benefits by:**

- **Providing American businesses and households with low-cost energy services by furthering low cost renewable supplies and energy efficient products and systems;**
- **Developing approaches and supporting industries that can accelerate economic growth and job creation while improving the environment by both reducing greenhouse gas emissions and improving air and water quality;**
- **Insulating the U.S. economy from the price and supply uncertainties associated with petroleum, and ensuring diversity and choice in the way energy services are produced.**

**EERE achieves this by developing and accelerating the adoption of a new generation of energy efficiency technologies – buildings, factories, and vehicles that are clean, safe, efficient, and productive. EERE supports innovation that will allow U.S. manufacturers and U.S. workers to lead the race and secure the benefits of clean, domestic energy systems as a foundation for a prosperous American future.**

### **QUESTION FROM CHAIRMAN BINGAMAN**

**Q20.** Over the last year, you have changed the name of the Industrial Technologies Program to the Advanced Manufacturing Office. How does the new program square with the current deployment needs of today's U.S. manufacturers to become more energy efficient in order to remain competitive and keep operating in the United States? What is the funding level for Combined Heat and Power?

**A20.** A continuing part of the mission of the U.S. Department of Energy's Advanced Manufacturing Office (AMO) is to support existing U.S. manufacturers through technology deployment and technical assistance efforts targeted to help manufacturers overcome specific barriers to adoption of energy efficient technologies and best practices as a path to strengthen their global competitiveness. AMO pursues this goal through a combination of education, recognition, and deployment expertise tailored to the particular challenges faced by manufacturers and the energy management industry. Included among those activities are:

- **Industrial Assessment Centers (IACs)** - A network of university-based, DOE-supported programs that conduct energy audits for small and medium size manufacturers while simultaneously training engineering students to help them become the next generation of energy management professionals.
- **Superior Energy Performance** - A market-based, American National Standards Institute (ANSI)-accredited energy management certification program that provides manufacturers and industrial facilities with a roadmap for achieving continual improvement in energy efficiency while maintaining competitiveness. The program provides a transparent, globally accepted system for verifying energy performance

improvements and management practices, and also serves as an implementation of the International Organization for Standardization (ISO) 50001 energy management system standard.

- **Clean Energy Regional Application Centers** – These centers provide technical assistance, education and outreach, and market development support to industry stakeholders as a strategy to accelerate the adoption of clean energy technologies – principally combined heat and power (CHP) – helping manufacturers save energy and money.
- **The Better Buildings, Better Plants Challenge and Program** – This is a national partnership program that aims to drive a 25% reduction in industrial energy intensity over 10 years in order to improve energy efficiency and enhance the overall competitiveness of the U.S. manufacturing sector. These public/private partnerships will also help to create energy efficiency oriented American jobs as companies execute energy saving programs, implement technologies, and share best practices as part of their corporate commitment to the program.

With specific regard to Combined Heat and Power (CHP), AMO is committed to supporting deployment efforts as well as research and development projects in its portfolio so long as these projects: 1) continue to meet their technical milestones, and 2) support AMO objectives. Existing CHP R&D projects and new CHP R&D activities will

be supported through the funds requested for Next Generation Manufacturing Processes (\$198 Million). The Clean Energy Application Centers (CEACs) will be supported under the funds requested for Industrial Technical Assistance (\$31 Million).

### **QUESTION FROM CHAIRMAN BINGAMAN**

**Q21.** The budget reorganization at the Office of Energy Efficiency and Renewable Energy means that there is no longer specific budget information for most programs. Could you provide us with the FY 2012 and proposed FY 2013 budgets for building energy codes, equipment standards and analysis, Energy Star (DOE portion), and superior energy performance?

**A21.** Below are the funding levels in FY12 and FY13 for selected Building Technologies programs:

**Funding for BTP Subprograms (\$000)**

<b>Subprograms</b>	<b>FY2012</b>	<b>Proposed FY2013</b>
<b>Building Energy Codes</b>	<b>8,500</b>	<b>9,500</b>
<b>Equipment Standards and Analysis</b>	<b>51,246</b>	<b>81,750</b>
<b>Energy Star (DOE portion)</b>	<b>7,000</b>	<b>7,000</b>
<b>Superior Energy Performance (BTP Portion)</b>	<b>1,750</b>	<b>1,750</b>

## **QUESTION FROM CHAIRMAN BINGAMAN**

**Q22.** DOE has helped recent model building energy codes achieve extraordinary success, with 30% savings for both homes and commercial buildings. What are your plans for building on that success? Will you consider making adoption of the new codes a criterion or scoring factor for state and local grants, as you did with the Better Buildings community program?

**A22:** With each new edition of the IECC, DOE is required to publish a determination whether the new edition will improve energy efficiency in residential buildings. DOE published the preliminary determination in the October 19, 2011 *Federal Register*, that the 2012 IECC would achieve greater energy efficiency in low-rise residential buildings than the 2009 edition. The final determination is currently being developed. Once a final determination is issued, each state will have two years to certify that it has compared the provisions of its residential building code to the 2012 IECC and has determined whether to revise its code to meet the 2012 IECC.

DOE published the ASHRAE 90.1-2010 Final Determination in the October 19, 2011 *Federal Register* that ASHRAE 90.1-2010 would achieve greater energy efficiency in commercial buildings than ASHRAE 90.1-2007. States have two years after publication of DOE's Final Determination to certify that the state commercial building code meets the provisions of ASHRAE 90.1 2010. Those certification letters are provided to the Office of Weatherization and Intergovernmental Programs that implements the Department's State Energy Program.

DOE participates in advancing codes on the national stage, however adoption, implementation, compliance and enforcement at the state and local level are key to ensuring the full energy savings potential of those codes and standards are realized. The

DOE Buildings Technology Program (BTP) facilitates code adoption by providing a robust technical support infrastructure to help states in taking the next step. To make adoption easier for states BTP provides numerous tools and support, ranging from technical analyses of proposed state code amendments to code-compliance software. To ensure transparency in DOE's development and deployment process, and to uphold the economic feasibility of the codes, DOE developed a Residential Cost Database and solicited input to improve its methodology for assessing the cost-effectiveness of residential building energy codes. DOE's Residential Cost-Effectiveness Methodology, which explains how DOE evaluates the energy and economic impacts of codes, was made publicly available via the [www.energycodes.gov](http://www.energycodes.gov) website, in April 2012. The Residential Cost Database was made available in May 2012.

### **QUESTION FROM CHAIRMAN BINGAMAN**

**Q23. The President recently committed to \$2 B in performance based contracting at federal agencies using private sector funds. We are encouraged by this announcement but note that the budget, if you take out the new funding for the FEEF, is actually reduced from last year. Will FEMP have the resources to comply with the Executive Memo and the many other statutory and executive mandates?**

**A23. FEMP does not anticipate a need for additional resources to support agencies in attaining this goal. FEMP is currently exploring methods of improving its delivery processes to be able to adequately respond to the Agencies, including both a request for information to improve and lower financing and a review to streamline the ESPC contracting process.**



## **QUESTION FROM CHAIRMAN BINGAMAN**

- Q24.** How can FEMP gain leverage over the other agencies of the Federal government to comply with their energy related mandates? Or does there need to be someone at the White House that further leverages agency actions?
- A24.** FEMP is the lead program in terms of collecting and reporting on federal progress toward the goals, and is the lead program in providing guidance, technical support, training, tools such as ESPCs, as they relate to energy policy implementation. FEMP has not been given further oversight responsibilities relative to other agencies.

However, FEMP does provide support to OMB in assessing agency progress toward achieving energy-related goals, coordinating the Interagency Energy Task Force and its sub-working groups including the Interagency Sustainability Working Group (ISWG). The ISWG was established in August 2001 and includes over 200 members representing 20 major and a number of independent Federal agencies. Through these working groups, FEMP recommends policy and reporting guidelines and develops technical guidance, web-based reporting and other tools to support the implementation of agency energy and sustainability requirements for Federally-owned, operated, and leased buildings. FEMP also provides support to OMB and the Agencies in compiling data and complying with the federal Greenhouse Gas emission reduction targets and OMB Sustainability/Energy Scorecard assessments as directed by Executive Order 13514.

Each year, FEMP reports findings to OMB and the Council on Environmental Quality (CEQ) of calculated scope 1, 2, and 3 GHG emissions from agency-aggregated energy and operations data. FEMP collects required data elements for measuring agency

progress towards meeting facility energy intensity reduction goals (42 U.S.C. 8253(a)), renewable electricity use requirements (42 U.S.C. 15852), water intensity reduction (E.O. 13514), facility metering requirements (42 U.S.C. 8253(e)) and compliance with Federal energy efficiency standards for new construction (10 CFR Parts 433, 434, and 435, 72 FR 72565). The results of this data are compiled and used by OMB to track agencies' progress in the OMB Agency Sustainability/Energy Scorecard.

FEMP also provides services, tools, and expertise to Federal agencies to help them achieve these goals. FEMP's range of services includes project financing, technical assistance, award programs, communications and training.

## **QUESTION FROM CHAIRMAN BINGAMAN**

### **Hydrogen and Fuel Cell Technologies**

**Q25.** The Department has made great progress in hydrogen fuel cell research, however, this technology is far from mature. Given the continued strong funding of fuel cell research in Japan and Germany, I am concerned about the proposed 20% reduction in hydrogen research for FY 2013. Can you please explain the reasoning behind the proposed budget reductions in this area?

**A25.** The budget request for hydrogen and fuel cells has been reduced as part of rebalancing the Department's portfolio of advanced technologies. However, hydrogen and fuel cells research and development remains an integral part of that portfolio. The budget request for fiscal year 2013 allows the Department to focus on hydrogen and fuel cell activities that will yield technology advancements in key areas—including ongoing reductions in the production cost and improvement in the durability of fuel cells, reductions in the cost of renewably produced hydrogen, and improvements in systems for storing hydrogen. Funding has been reduced for aspects of the program with less impact on R&D progress, such as technology validation, codes and standards, and market transformation. Rebalancing the portfolio will allow the Department to focus on nearer term transportation technologies while maintaining a strong effort in hydrogen and fuel cells R&D. The FY 2013 budget request should allow the United States to maintain its leadership position in the emerging hydrogen and fuel cell market.

## **QUESTION FROM CHAIRMAN BINGAMAN**

### **Hydropower**

- Q26.** The proposed 66% reduction in funds for the Water Power Program in EERE appears to be a departure from the President's goal of generating 80% of the country's electricity from clean energy sources by 2035 of which conventional hydropower and marine hydrokinetic power together are projected to contribute 15% of that objective. While the budget justification suggests that this is due in part to the successful completion of several conventional hydropower projects, the marine hydrokinetic power program will also suffer shortfalls if this budget is enacted. Would you please describe more fully the Department's justification for cutting this specific program within EERE?
- A26.** In FY 2012, the Department will continue and complete a number of important water power technology research and development projects. The \$20 million requested in FY 2013 would allow the Department's Water Power Program to continue its ongoing efforts to advance water power technologies and accelerate their market adoption. This funding level would allow DOE to support a number of water power technologies that can be developed for both conventional hydropower and the emerging marine and hydrokinetic (MHK) energy generation.

For hydropower specifically, DOE selected 16 new innovative hydropower technology development projects for funding in FY 2011, and that work will continue into FY 2012 and FY 2013. Additionally, DOE expects to continue its efforts to analytically quantify the benefits that conventional and pumped-storage hydropower provide to the electric grid, which can also support the integration of variable renewable resources like wind and solar.

For MHK technologies, in FY 2013 activities are expected to focus on developing a suite of technologies that harness the energy from wave, tidal, and current resources.

Specifically, MHK research is expected to focus on maintenance and development of advanced open water test infrastructure for MHK devices and research into the costs and performance of innovative, early-stage MHK systems and components.

Finally, resource and technology assessments will be conducted in FY 2012 and FY 2013 to accurately characterize all opportunities for water power development. DOE intends to use data from ongoing techno-economic MHK assessments to establish baseline costs, which DOE will use along with resource assessments to evaluate the need for further innovative water power R&D.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Fossil energy**

**Q1. I disagree with the Administration's proposal to cut funding for fossil fuel work again by \$105 million. Alaska's North Slope has an estimated 25 billion barrels of heavy oil, largely in the Kuparuk field, but far more research is needed for the technology to extract that oil out of the ground, even at current prices. According to DOE's own reports, the U.S. and Canada have enough heavy oil to meet our country's total needs and prevent dependence on non-North American sources for 150 years – if the energy can be made more economic to produce. This is research that could help America, not any particular oil company. Why then, is the Administration seeking to reduce this longer-term research that could pay substantial benefits in the future, especially for smaller companies and independents that don't have the research budgets of the larger oil companies?**

**A1. America's abundant unconventional oil and natural gas resources are critical components of our Nation's energy portfolio. Their development enhances our energy security and fuels our Nation's economy. Given limited research funding, the Department's current focus is primarily on safe and environmentally sustainable development of unconventional natural gas resources.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Methane Hydrates**

- Q2. What technological advances are still needed to facilitate large-scale development of methane hydrates, particularly in the Arctic?**
- A2. The present challenge is to determine whether methane hydrate deposits can yield methane gas at the rates necessary to make Arctic or deep-water production commercially viable.**

**The next critical step in methane hydrate development in the U.S. Arctic region will be the facilitation of a long-term production test. To be most effective, the test should include comprehensive scientific data acquisition during drilling, extended duration flow testing designed to advance scientific understanding by isolating reservoir response to specific production/stimulation inputs, and extensive monitoring of both reservoir response and potential environmental impacts. The results of this test will support the further development of comprehensive geologic and engineering models.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Alaska Transmission**

- Q3.** Alaska probably has the greatest potential of any state to produce renewable energy. According to two recent DOE analyses, my home state has 2,400 known and potential megawatts of geothermal; 90% of the nation's tidal potential – representing 47,437 megawatts of known power; 50% of its potential wave energy – representing 1,360 Terrawatts hours; 9 megawatts of in-river hydrokinetic energy; and nearly 400 hydroelectric sites (300 alone in Southeast Alaska), easily able to produce more than 1,100 megawatts. The problem is that there is no way to get all of that power to markets in need of clean, renewable energy in the continental U.S. Can the administration assist with possible ways to facilitate and finance the installation of high-voltage transmission to better move this tremendous renewable power to market? It seems to me that we are spending a lot of money on new technology, even though we can develop substantial renewable power with known or nearly proven technology if we simply can find a way to economically get it to market.
- A3.** The Administration is committed to increasing the use of our country's vast renewable resources, including but not limited to geothermal, tidal, and hydroelectric energy. We are using all of the tools available to tap into these resources. To that end, last year, the Administration created the Rapid Response Team for Transmission whose charge is to expedite the evaluation of high-voltage transmission applications. This team is currently working on seven pilot projects that, if approved, will facilitate the development of more than 3,000 miles of transmission lines and create more than 11,000 direct jobs.

However, the challenges of moving the renewable sources from Alaska to market are significant. The costs of building transmission to connect this mainland infrastructure to the renewable-rich State of Alaska would be very high.



Additionally, there are a number of technical challenges of moving large amounts of renewable-fueled electricity long distances. Transporting energy from the renewable rich state of Alaska to electricity customers in the continental United States would likely require long direct current (“DC”) lines. These projects are very costly; however, DOE is conducting research and development on ways to reduce the costs. As costs decline the economics of delivering energy from Alaska to the continental United States will likely improve.

Finally, a major challenge is the lack of cost-effective large-scale storage of electricity. DOE is also conducting significant research and development on grid-scale storage. Unlocking the storage puzzle will greatly improve our ability to integrate more renewables into the electric grid.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Water Power**

- Q4.** If the Department does not continue to invest in new, innovative hydro technologies, modernizing operations, and expanding hydro's contributions to the nation's electricity supply – currently 8 percent, the largest of all the renewables – how do you propose to meet your own goal to significantly increase renewable energy production? Your budget materials include water power resources under that vision, but your funding levels for the program appear to undermine it. Will it be all through intermittent wind and solar generation?
- A4.** Hydropower is currently our nation's largest source of clean, renewable electricity generation, contributing over 60% of our nation's renewable electricity output annually.

DOE is committed to expanding hydropower technologies to both increase the efficiency of current hydropower generation and develop new ways to produce electricity from wave, tidal, and other marine hydrokinetic sources. DOE recently selected 16 new innovative hydropower technology development projects for funding in FY11, and that work will continue into FY 2012 and FY 2013. Additionally, DOE intends to continue its efforts to analytically quantify the benefits that conventional and pumped-storage hydropower provide to the electric grid, which can also support the integration of variable renewable resources like wind and solar.

### **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q5.** DOE testified before this Committee last year that the Department's estimates indicate that there could be an additional 300 gigawatts of hydropower through efficiency and capacity upgrades at existing facilities, powering non-powered dams, new small hydro development and pumped storage hydropower. Why then, given this tremendous potential of conventional hydropower resources, does the Administration proposed to not only slash funding for this renewable water power resource, but commit the remaining anemic funding to only marine and hydrokinetic technologies?

**A5.** In FY 2012, the Department will continue and complete a number of important water power technology research and development projects. The \$20 million requested in FY 2013 allows the Department's Water Power Program to continue its ongoing projects to advance water power technologies and accelerate their market adoption. At this funding level, DOE would be able to support a number of water power technologies that can be developed for both conventional hydropower and emerging marine and hydrokinetic (MHK) energy generation.

For hydropower specifically, DOE selected 16 new innovative hydropower technology development projects for funding in FY 2011, and that work will continue into FY 2012 and FY 2013. Additionally, DOE expects to continue its efforts to analytically quantify the benefits that conventional and pumped-storage hydropower provide to the electric grid, which can also support the integration of variable renewable resources like wind and solar. Finally, DOE anticipates conducting resource assessments in FY 2012 and FY 2013 to further refine the 300-GW gross hydropower potential and accurately characterize all opportunities for new hydropower development across the country. In addition, DOE intends to use data from ongoing techno-economic MHK assessments to

**establish baseline MHK costs, which DOE will use along with resource assessments to evaluate the need for further innovative water power R&D.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Nuclear**

**Q6a. Within the Office of Nuclear Energy budget request, your budget ends funding for the Integrated University Program, a program that I have heard very good reviews about. Could you explain why you want to end that program?**

**A6a. The Department sets aside 20% of its nuclear energy R&D funding for work at universities, which is an effective way to get students interested in nuclear energy R&D and introduce them to the work done at DOE and the national laboratory environment. In addition, the Department is confident that expansion of the nuclear industry will create incentives necessary for students to enter nuclear-related education and training programs. The Department is currently evaluating more efficient ways to draw students into its technology missions if needed, including nuclear energy.**

### **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q6b. Are there more efficient ways to advance student involvement in nuclear programs?**

**A6b. Yes, the Department believes that there are more efficient methods to advance student involvement in nuclear programs than those employed by the Integrated University Program. Through a DOE-wide coordination effort the Department will be evaluating how it can better coordinate and leverage its existing science, technology engineering and mathematics (STEM) programs, as well as take better advantage of the capabilities at the DOE laboratories and their collaborative relationships with colleges and universities, to more effectively address the Department's critical scientific and technical workforce needs.**

#### **QUESTION FROM RANKING MEMBER MURKOWSKI**

- Q7.** Within the Office of Nuclear Energy budget request, you propose reducing the Reactor Concepts Research, Development and Demonstration Program by over \$40 million. What parts of the program would be reduced and for what reason?
- A7.** Within Reactor Concepts, the Department chose to focus its resources on research and technology development activities that have a higher potential for near-term impact. The allocation of available resources is consistent with our goals in the reactor areas, extending the life of the current reactor fleet and improving the affordability of new reactors.

While each of the four subprograms within this budget element were reduced, the Light Water Reactor Sustainability program was least impacted. This program addresses near-term activities supporting the safe, long-term operation of the current fleet of 104 nuclear power plants. These plants provide the vast majority of our carbon-free electricity production and are a vital clean energy asset.

The other programs within Reactor Concepts Research, Development and Demonstration include technologies that have a longer timeframe for commercialization and will depend to a large degree on future fuel cycle, uranium resources and waste management considerations. We will pursue every opportunity to leverage our efforts with universities, industry and the international community.

## QUESTION FROM RANKING MEMBER MURKOWSKI

### ARPA-E

Q8. You are requesting an additional \$75 million for ARPA-E's budget, bringing it to \$350 million. You are also refocusing ARPA-E's mission to place a priority on Transportation Systems. With the small fraction of projects that are likely to be successful, given the high-risk high-reward nature of the ARPA-E program, is it wise to so narrowly focus ARPA-E's mission on one topic? If we are looking for game changing technology innovations across the energy spectrum, why should we limit ourselves to one area?

A8. ARPA-E believes that combining its investments in high-impact solutions that cut across multiple energy-related challenges with its nimble management structure provides it with the flexibility to react to changing market and technological conditions.

ARPA-E's investment approach is also consistent with the Quadrennial Technology Review (QTR), which stated in part:

*"Informed by the QTR process, DOE will give greater emphasis to the transport sector, where innovation can impact all three energy challenges [i.e. Energy Security, Environmental challenges, and Competitiveness challenge]."*<sup>1</sup>

ARPA-E's Recovery Act, FY 2011, and FY 2012 investments are split approximately evenly between the Stationary and Transportation sectors. With the FY 2013 request, ARPA-E seeks to invest about 57% of its funds appropriated for projects in Transportation Systems, 40% in Stationary Power Systems, and the remainder on its Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) program. Specifically, in FY 2013 ARPA-E's Transportation investments would include advanced manufacturing and vehicles research. ARPA-E would continue to

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<sup>1</sup>U.S. DOE Quadrennial Technology Review Volume I (2011), page 124, available at: [http://energy.gov/sites/prod/files/QTR\\_report.pdf](http://energy.gov/sites/prod/files/QTR_report.pdf). Note, parenthetical information taken from page 123.



invest in both alternative domestic sources of sustainable fuels and electrification of vehicles. ARPA-E believes there are critical “white spaces” within the field of transportation systems.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Uranium Enrichment**

Your budget proposes to reinstate the collection of revenues under the Uranium Enrichment Decontamination and Decommissioning Fund, specifically \$200 million per year from utilities while the federal government would pay in \$463 million.

**Q9. Has the government fulfilled its financial obligations toward the Fund as directed by the Energy Policy Act of 1992?**

**A9. Yes, the Government fulfilled its financial obligation for deposits into the Fund with the FY 2011 appropriation.**

**QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q10. How much of a shortfall is expected in the Fund?**

**A10. The shortfall reported in the 6<sup>th</sup> Triennial report to Congress in December 2010 was \$11.8 billion.**

**QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q11. If Congress were to reauthorize revenue collection, for how much longer should utilities expect to pay into the Fund?**

**A11. Should Congress reauthorize revenue collection from the Domestic Nuclear Utilities, the amount of revenue and the time utilities could expect to pay into the fund would be subject to Congressional determinations of appropriate cost share with the Government, considering the schedules and costs for the Office of Environmental Management cleanup program.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Uranium Enrichment**

**Q12. Why should the private sector pay additional money for what is essentially defense waste?**

**A12. The utilities agreed to participate in the establishment of the Uranium Enrichment Decontamination and Decommissioning Fund for the first 15 year period of the fund, based upon fuel they purchased when they were legally required to do so from Government enrichment facilities. The reauthorization of the utility contributions is necessary because the balance in the Fund is currently inadequate to fully fund remediation of the three gaseous diffusion plants.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Strategic Petroleum Reserve**

**Q13.** The proposed budget calls for a \$291 million rescission of funds from the SPR petroleum account. This is in addition to the \$500 million rescission that was authorized in last year's Omnibus Appropriations Act. Mr. Secretary, is it consistent with the law to use our SPR as an ATM?

**A13.** The FY 2013 Budget proposes to use the SPR Petroleum Account receipts to repurchase about 27 million of the 31 million barrels sold in the SPR Drawdown by 2017, which will provide the Nation with sufficient import protection. The remaining funds of \$291 million are not required and can be cancelled.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q14.** The budget also proposes that the remaining balance of the SPR account be used to repurchase 27 million barrels of oil, sold last June. Given that Louisiana Light Sweet crude is trading at around \$121/barrel, the remaining \$2.4 billion should only be sufficient to repurchase less than 20 million barrels at today's prices. Mr. Secretary, absent the royalty-in-kind program which this budget would repeal, how does the DOE propose to repurchase the remaining oil that was sold last summer? Or does the DOE believe that oil prices are on the decline?

**A14.** The SPR stores 696 million barrels of crude oil, which provides adequate U.S. import protection at this time.

The FY 2013 budget assumes the repurchase of about 27 million barrels of crude oil sold in 2011 over the 5-year period from 2013 to 2017. The objective is to re-enter the oil market during a time when world oil supplies and market prices are stable and to secure the best price for the American taxpayers.

In 2009, the DOE was able to purchase 11 million barrels at an average price of \$52.17 to replace barrels that were sold following Hurricane Katrina in 2005 for about \$65 per barrel.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Natural Gas/Hydraulic Fracturing**

**Q15. DOE's Fossil Energy Office is requesting a \$2 million increase (to \$17 million total) in Natural Gas Technologies research and development. This effort would fund a DOE initiative with EPA and USGS "to understand and minimize" the impacts associated with fracking. I understand this to be a follow on to your Advisory Committee's report, and we had Dan Yergin and several other board members in to talk about the 90 day report before the final report was finished. In addition to analyzing all of the potential environmental impacts associated with shale gas development, the report presented 20 specific recommendations for how these impacts can be successfully mitigated. Can you please explain what specifically about the Advisory Committee's report and recommendations were insufficient and warrant a second investigation?**

**A15. The Secretary of Energy Advisory Board (SEAB) in fact recommended expanded federal research on specific safety and environmental questions. The next step is to more precisely define the specific research questions suggested by the wide set of topics articulated in the SEAB recommendations.**

**On April 13, 2012 DOE, the Environmental Protection Agency, and the Department of the Interior's U.S. Geological Survey signed a Memorandum of Agreement formalizing this Multi-Agency Collaboration on Unconventional Oil and Gas Research.**

**Through this collaboration, a robust Federal R&D plan is being developed, taking into account the recommendations of the SEAB. DOE's role in this initiative will focus on priorities identified by the interagency collaboration in a research plan to be formed over the next nine months within its area of core research competencies, including wellbore integrity, flow and control; green technologies; and systems engineering, imaging and materials.**



## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Natural Gas/Hydraulic Fracturing**

**Q15a. Why is there a need to fund this initiative when the advisory board's recommendations are already finalized and most of their proposed directives fall on the states?**

**A15a. SEAB recommended that specific research be undertaken by the federal government and this budget request would actually implement that recommendation. On April 13, 2012 DOE, the Environmental Protection Agency, and the Department of the Interior's U.S. Geological Survey signed a Memorandum of Agreement formalizing this Multi-Agency Collaboration on Unconventional Oil and Gas Research.**

**Through this collaboration, a robust Federal R&D plan is being developed, taking into account the recommendations of the SEAB. DOE's role in this initiative will focus on priorities identified by the interagency collaboration in a research plan to be formed over the next nine months within its area of core research competencies, including wellbore integrity, flow and control; green technologies; and systems engineering, imaging and materials. The three agencies, DOE, EPA, and USGS, each possess discrete and specialized capabilities in particular scientific disciplines and technical areas.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q15b. Is this new initiative an attempt to uncover a “smoking gun” that has yet to surface and effectuate new layers of federal rules over hydraulic fracturing?**

**A15b. The DOE, EPA, and USGS effort will identify research priorities and collaborate to sponsor research that improves our understanding of the impacts of developing our Nation’s unconventional natural gas resources and ensure that these resources are developed in a safe and environmentally sustainable manner. Through enhanced cooperation, the agencies will maximize the quality and relevance of this research, enhance synergies between the agencies’ areas of expertise, and eliminate redundancy.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Nuclear**

**Q16. Your budget requests \$10 million from the Nuclear Waste Fund for the Office of Nuclear Energy. The Nuclear Waste Policy Act lays out specific purposes for what funds in the Waste fund may be spent on. Could you describe how the Office of Nuclear Energy intends to use expenditures from the Nuclear Waste Fund?**

**A16. Consistent with the Blue Ribbon Commission recommendation to promote the better integration of storage into the waste management system, including standardization of dry cask storage, DOE will develop standardized container specifications with industry and award contracts to vendors to design standardized containers. This is also consistent with direction in the FY 2012 appropriations for development and licensing of standardized transportation, aging, and disposition canisters and casks.**

**In the area of transportation, DOE will finalize transportation procedures for technical assistance to States and tribes consistent with section 180 (c) of the Nuclear Waste Policy Act, will initiate pilot training programs for emergency responders along those routes from decommissioned sites, and will expand interaction with Transportation Stakeholders.**

**QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q17. Could you please provide more detail on how you intend to utilize the requested \$60 million to advance the recommendations of the Blue Ribbon Commission?**

**A17. The Blue Ribbon Commission acknowledged the importance of the ongoing work related to used fuel disposition, and recommended the continuation of the activities. The funding within the Used Nuclear Fuel Disposition subprogram in FY 2012 aligns with the Commission's near-term research and development-related priorities. The Department's FY 2013 Congressional budget request builds on these efforts initiated in FY 2012. Specifically, the Department intends to continue systems studies related to consolidated storage and related transportation; continue research and development on the extended storage of spent fuel; expand interactions with transportation stakeholders; continue studies of non-site specific geologic disposal options; and complete a research and development plan for deep borehole disposal.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Unconventional Fossil Fuels research**

**Q18.** This budget again zeroes out the unconventional fossil program, I take it as part of the Administration's efforts to end so-called "subsidies" to fossil fuels. But the budget maintains major CCS funding as well as some natural gas R&D funding. Meanwhile, the President has touted DOE's support for research in shale gas as a major success story. What's so wrong with including unconventional fossil fuels in a budget, especially when "unconventional" methods of extracting and using them has turned out to mean cleaner ways of extracting and using them?

**A18.** The FY 2013 Fossil Energy research and development budget request, which is about 23 percent more than previous year's does, in fact, focus on unconventional fossil energy resources in light of high priority research recommendations received from the Subcommittee of the Secretary of Energy Advisory Board (SEAB). These research efforts will help to improve our understanding of the impacts of developing our nation's unconventional natural gas resources and assist in developing new technologies that will enhance safe and environmentally sustainable development of these resources.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **ATVM Program**

- Q19.** Just five loans have been issued since funding was appropriated to this program in 2008, including just one loan in the past year. DOE initially claimed the program was oversubscribed, but now it's virtually dormant. Last year at this time, DOE stated that it anticipated "offering a number of additional conditional commitments under the program in the near future." What happened to that? Are there no viable projects, or are other factors preventing DOE from making yes-or-no decisions in a timely manner?
- A19.** The ATVM Loan Program has closed five loans totaling over \$8.3 billion. While the ATVM Loan Program was oversubscribed, certain events occurred over the past year that reduced the applicant pool, including the withdrawal and rejection of several applications. Reasons for rejecting the applications include, but are not limited to, substantial market risk, financial distress and credit risk, and technical development risk.

The program will continue to work with remaining applicants, with an aim to communicating application status in a timely manner. In addition, the program is simultaneously reaching out to additional potential applicants via trade organizations and digital media. The ATVM Loan Program continues to be an attractive source of funding for automotive manufacturers of vehicles and components, receiving new applications and indications of interest regularly. We are striving to allocate a significant portion of ATVM's remaining credit subsidy by the end of the fiscal year.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Vehicle Subsidies**

- Q20.** In other parts of the budget, the administration proposes to modify and expand the electric vehicle tax credit. The 200,000 vehicle per manufacturer limit is removed, the per-vehicle limit is raised to \$10,000, and more technologies would be eligible based on a formula. That seems incredibly lavish. First-time homebuyers received an \$8,000 credit – and now, for a single vehicle, the administration is proposing an even higher subsidy. Can you defend that? How does a \$10,000 per vehicle subsidy make sense at a time of trillion dollar deficits, and repeated statements from administration officials that the costs of batteries should come down dramatically over the next several years? How can you square this proposal with the President’s statement from last year that the tax code is already too riddled with “special interest loopholes”?
- A20.** The electric vehicle tax credit is not within DOE’s jurisdiction.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Fuel Cells**

- Q21.** According to the budget request, you want to significantly reduce funding for fuel cell technologies because of “substantial progress in research innovations.” Can you explain that logic, especially in the context of your request for significantly more funding for electric vehicles, which are now being commercially sold?
- A21.** Significant progress has been made in fuel cell technologies, including reducing the modeled cost of fuel cells by more than 80% since 2002. The FY 2013 budget request will allow the Department to concentrate on high impact hydrogen and fuel cell R&D activities that will continue to yield technology advancements in key areas—including ongoing reductions in the cost and improvement in the durability of fuel cells, reductions in the cost of renewably produced hydrogen, and improvements in systems for storing hydrogen. Rebalancing the Department’s advanced technologies portfolio will allow a focus on nearer term transportation technologies while maintaining a strong effort in hydrogen and fuel cells.



## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Cellulosic Biofuels**

**Q22. In early 2010, your Department set a goal to drive the costs of cellulosic ethanol down to \$1.76 per gallon in 2012. Can you provide us with an update on any progress made? How close – or how far – is unsubsidized cellulosic biofuel from commercial competitiveness?**

**A22. The DOE Biomass Program is on track to meet its major milestone of achieving cellulosic ethanol cost of \$1.76/gallon of ethanol by the end of FY 2012. This cost milestone is expected to be validated at the pilot scale at the National Renewable Energy Laboratory during the summer of 2012. The noted cost does not reflect the cellulosic ethanol costs from first-of-a-kind pioneer plants but rather the cost attainable after several plants that have been built with the lessons learned and the technology developed by DOE and its partners. Achieving this milestone would mean that the Biomass program would de-emphasize cellulosic ethanol research and that DOE would focus on research for “drop-in” biofuels, which are more infrastructure compatible (e.g, bio-derived gasoline, diesel, and jet fuel). Biobased hydrocarbon fuels can be used in applications like heavy trucks and planes where electrification may not be suitable.**

**The DOE Biomass program has already started construction at four, commercial scale “drop-in” biofuel pioneer and plans to have them operational in FY 2013 (Abengoa, Mascoma, Ineos, and Poet). These first plants will likely require the currently available cellulosic tax credit of \$1.00 per gallon to be initially cost competitive. Once we have operating experience with these plants, we can better project when they can compete on an unsubsidized basis.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Natural Gas Tax Hikes**

**Q23.** I think it would be a mistake to raise taxes on our nation's energy producers by \$40 billion over the next ten years, as this budget proposes. But setting aside my general concerns – the impact it would have on supply and prices paid by consumers – I want to ask a more specific question. Why has the Department continued to target natural gas for a tax hike? With natural gas prices at historical lows, we have seen reports that some producers are already considering shutting in their wells because they simply cannot make any money off of them. Did the administration give any consideration to the impacts that its proposed tax increases could have on natural gas production and prices in the longer term?

**A23.** The Administration believes these tax code adjustments are appropriate given overall industry revenues and profits and would not have an adverse impact on domestic oil and gas production. These tax changes are small enough they should not have any real impact on domestic natural gas prices.

The tax credits that the Administration proposes to repeal for oil and natural gas distort commercial markets. This market distortion is detrimental to long-term energy security and is also inconsistent with the Administration's policy of supporting a clean energy economy, reducing our reliance on oil, and cutting carbon pollution. Moreover, any tax credit must ultimately be financed with taxes that result in underinvestment in other, potentially more productive, areas of the economy. Furthermore, as the demand for natural gas increases, competitively-priced supplies of natural gas will be available to meet that demand.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Battery Costs**

**Q24.** The Department has projected that battery costs for electric vehicles will come down dramatically over the next several years. Can you provide the committee with a current breakdown showing how much components, R&D, metals, other materials, labor, and any other costs currently contribute to advanced battery prices? Can you explain where you see substantial cost reductions coming from, especially in the context of each of those categories?

**A24.** A September 2011 ANL modeled the costs of lithium-ion batteries for electric drive vehicles, and indicated the following: raw materials, 50%; purchased parts, 16%; depreciation, 9%; direct labor, 4%; variable overhead, 4%; general sales and administration, 4%; R&D, 4%; profit, 4%; and warranty, 5%.

Substantial future cost reductions are expected to be derived from the use of higher-performance, lower-cost raw materials in batteries currently in development (e.g., less nickel and cobalt, more manganese), improvements in battery design (higher cell capacity resulting in fewer number of cells required), better materials processing and cell assembly manufacturing, learning-curve cost reductions, and the economies of scale in mass production.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Vehicle Technologies Program**

**Q25. In looking at this year's budget request, the Department appears to continue its trend of heavily favoring electric vehicles. What percentage of the \$420 million request for the Vehicle Technologies program would go to electric vehicles? What percent would go to other promising technologies, like natural gas vehicles or ultracapacitors?**

**A25. Through a comprehensive and coordinated effort among its Office of Science, the Advanced Research Projects Agency-Energy (ARPA-E), and Office of Energy Efficiency and Renewable Energy, the Department supports a broad range of advanced vehicle technologies in various stages of development. The FY2013 request for Vehicle Technologies Program (VTP) activities includes \$203 million for batteries and electric drive components (48% of the VTP total). Of this amount, approximately \$4.5 million would focus on ultracapacitor development. The VTP FY2013 request includes an additional \$35 million for electric-drive vehicle systems modeling, analysis, and testing activities. It is important to note that the aforementioned funding supports development of technologies for the full range of electric-drive vehicles – including plug-in electric hybrids, extended range electric vehicles, and micro hybrids, as well as battery electric vehicles – and cuts across light-duty and heavy-duty vehicle classes.**

**VTP supports a portfolio of technologies and approaches to petroleum reduction in addition to electric drive, including advanced combustion, materials technology, and fuels technology research and development, as well as demonstration and deployment of a wide variety of alternative fuels and advanced, fuel-efficient technologies.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Community Deployment Program**

**Q26.** The President's budget proposes a \$1 billion community deployment program for advanced vehicles. Which agency would administer that program? What is maximum amount of funding that could be made available to each community? If funding is appropriated to it, how will you ensure that public dollars do not crowd out investments now being made by private companies?

**A26.** The Department of Energy would administer the program. As noted in the White House Fact Sheet issued March 7, 2012, the program embraces a strategy proposed by Senators Jeff Merkley (D-OR) and Lamar Alexander (R-TN) in the Promoting Electric Vehicles legislation, but takes a fuel neutral approach and includes the development of up to five liquefied natural gas corridors for long-haul trucks. The Department is working to finalize program details, but envisions that between 10-15 communities would receive funds through an open and competitive process, and a minimum 50% cost share of the total project value would be required.

Funds would encourage, and not crowd out, private investment. Selection criteria would be based on the strength of the local community partnership and its ability to meet program objectives, the demonstrated commitment of partners, the ability to significantly leverage Federal funds, the strength of the business case, and the plans – as well as the team's ability – to ensure project sustainability upon expenditure of Federal funds.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Biofuel Grants**

**Q27. In the Biomass and Biorefinery Systems account, the Department notes that it wants to provide “an additional installment for the full-fledged construction of demonstration and commercial scale integrated biorefinery projects that were competitively awarded in 2007 and 2008 and that will be operational in 2014.” Can you provide further details about that proposal? How many projects would this affect, how much funding would be required, and why is additional funding needed at this time?**

**A27. The Biomass Program ran two competitive biorefinery solicitations, one each in 2007 and 2008. These two solicitations resulted in 11 awards: 4 commercial scale cellulosic ethanol biorefineries in 2007 and 7 demonstration scale cellulosic ethanol biorefineries in 2008. The benefits created by these programs will help to promote a new cellulosic biofuels industry that has the potential to replace crude oil consumption, enabling economic activity in rural America, enhancing our energy security, and dramatically decreasing the emissions of GHG from the transportation sector.**

**These biorefinery projects were all funded incrementally and the awards are contingent on the availability of appropriated funds and ability for recipients to meet cost-share requirements and stage-gate criteria for proceeding to subsequent phases. The four awards from the 2007 solicitation for commercial scale cellulosic ethanol biorefineries have been fully obligated and do not require additional funding. Of the seven awards from the 2008 solicitation, four require a total of \$123M to fulfill the total award amount. The FY 13 requested funds would be used to achieve the total amount for three of the four demonstration scale biorefineries.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Biofuel Procurement**

**Q28. DOE has requested authority to transfer funds to the Department of Defense for biofuel procurement. How much funding do you anticipate would be transferred? At a time of unprecedented debt – and in a budget request that projects a trillion dollar deficit – do you believe it is appropriate for the government to sign contracts that require it to pay more than \$25 per gallon of biofuel?**

**A28. The Biomass Program seeks to lower the cost of advanced biofuels by focusing on RD&D across the biofuels value-chain that supports the development of innovative technologies and lowers the financial, technical, and market risks of deploying integrated biorefineries.**

**The Biomass Program is requesting \$40M to be transferred to the Department of Defense to support jointly funded biorefineries for the demonstration of the production of military grade diesel and jet fuels at commercial scale with the military being the first customer for these fuels..**

**This initiative would not be used to subsidize the military's purchase of fuel. Rather, the Navy, USDA and DOE, would mutually support the missions of each agency in accelerating the capability to produce domestic, bio-based hydrocarbons such as gasoline, diesel and jet fuel. If these fuels meet military specifications, then this would open up other markets for these products and gain the confidence of private sector investors necessary for scaling the industry.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **ARPA-E Funding**

**Q29. In the budget request, “natural gas fueled transportation systems” are listed within the ARPA-E account as a “potential future program.” Why are those systems considered appropriate for ARPA-E, instead of the Vehicle Technologies program within EERE?**

**A29. ARPA-E’s invests in early-stage technologies that have the potential to be transformational, including new vehicle technologies. The Methane Opportunities for Vehicular Energy (MOVE) program is focused on breakthrough research to develop technology that can significantly reduce the cost of natural gas storage systems in vehicles as well as compression systems for home refilling. The projects supported are working on fundamentally different technology than what is being funded within the Vehicle Technologies Program. Today’s natural gas vehicle technologies require tanks that can withstand high pressures, are cumbersome, are either too large or too expensive to be suitable for passenger vehicles, and cannot hold sufficient fuel to provide comparable range to today’s gasoline powered vehicles. MOVE will fund research into innovative, low-cost Compressed Natural Gas (CNG) storage technologies and methods to lower pressure in vehicles while maintaining the same amount of gas storage.**

**ARPA-E takes very seriously its statutory requirement to ensure its activities are coordinated with, and do not duplicate the efforts of, programs and laboratories within the Department and other relevant research agencies. In this case, ARPA-E and EERE’s Vehicle Technologies Program (VTP) have close formal and informal working relationships.**



**QUESTION FROM RANKING MEMBER MURKOWSKI**

**Total Clean Energy Spending**

**Q30. Collectively – across all federal programs and all federal agencies – how much does the President’s Fiscal Year 2013 budget propose to spend on clean energy?**

**A30. The FY 2013 President’s Budget requests \$6.7 billion for clean energy research, development, demonstration, and deployment government-wide. Please see Section 22 (Special Topics, Research and Development, page 366) of the FY 2013 President’s Budget Analytical Perspectives volume.**

**QUESTION FROM RANKING MEMBER MURKOWSKI**

**1603 Grants Program**

**Q31. What is the total estimated cost of all projects that were – or could still be, based on various deadlines within the program – funded by the Section 1603 grants program?**

**A31. This question is not within DOE's jurisdiction.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **ARRA Spending**

- Q32.** According to the Department of Energy's website, roughly \$13 billion in stimulus funding has not yet been spent. What has prevented those funds from being spent? When do you anticipate the Department will be able to report 100 percent spendout?
- A32.** The Department of Energy has been deeply committed to ensuring that recipients are spending their Recovery Act funds in an efficient and responsible manner. As of November 25, 2012, the Department of Energy's approximately 5,000 Recovery Act recipients have outlaid \$27.4 billion (80% of total stimulus funds obligated by the Department), to support over 15,000 clean energy projects across the country. These Recovery Act investments are putting Americans back to work, making our homes and businesses more energy efficient, increasing the use of clean and renewable electricity, cutting our dependence on oil, and modernizing the electric grid.

Based on current spending, the Department of Energy expects that by the end of fiscal year 2013, over 90 percent of DOE granted stimulus funds will be spent by recipients. One hundred percent of Recovery Act funds will be spent by end of FY15 in accordance with law.

As was known from the inception of the Recovery Act, DOE's Office of Fossil Energy (FE) carbon capture, utilization, and storage (CCUS) and clean coal power initiatives will account for nearly half of the funds that will be spent in FY14 and FY15. The majority of FE's Recovery Act projects are large, capital intensive projects that involve long-lead times for siting, permitting, design and construction. While DOE's experience in prior

negotiations allowed DOE to streamline the process for award negotiations and receive well-defined project management plans from recipients, these multi-million and billion dollar clean coal projects require an average of 2 years for completion of siting, permitting and design phases of the project before well-executed construction and retrofits can begin.

The remaining portion of Recovery Act funds to be spent after FY13 is primarily from:

- **The Advanced Battery Manufacturing Program (68% of total ARRA funds spent as of November 25, 2012; 83% of total Recovery Act funds spent by end of FY13):**

DOE competitively-awarded funds for 30 projects to build domestic capacity for manufacturing advanced batteries and electric drive components – not only creating jobs but also helping to ensure the U.S. remains a leader in a fiercely competitive global automotive market. Industry is providing slightly more than 50 percent cost-share. Prior to the Recovery Act, domestic battery manufacturing was negligible; as of December 31, 2011, our Recovery Act projects created a total battery manufacturing capacity of 145,000 batteries/year.

- **Smart Grid (79% of total ARRA funds spent as of November 25, 2012; 92% spent by FY13):** More than \$4 billion in Recovery Act smart grid investments are helping to modernize our grid, critical to meeting today's increasingly complex electricity needs. These Recovery Act investments for smart grid projects went to 49 states and two territories to help build a more stable, secure electrical grid. The funds projected to be

spent after FY13 are associated primarily with smart grid demonstration projects designed according to the original 5 year timeline set by the Recovery Act statute. These projects require additional time to complete due mainly to the scale of technologies and installations, often involving multiple states or regions; and longer field validation and data collection required for these first-of-a-kind technologies.

### **QUESTION FROM RANKING MEMBER MURKOWSKI**

- Q33.** The Department's IG and others have suggested that it may ultimately be appropriate to return at least some ARRA funding (e.g., from the Energy Efficiency and Conservation Block Grant program) to the Treasury. Do you agree? Please explain.
- A33.** As part of the Recovery Act, the Department of Energy's 5,000 recipients have spent \$23.1 billion (67% of total stimulus funds obligated by the Department), and averaged 91% of the monthly payment plan that it developed and submitted to OMB nearly two years ago. The Department of Energy has been deeply committed to ensuring that recipients are spending their Recovery Act funds in an efficient and responsible manner, and continues to diligently monitor its Recovery Act programs and projects to completion.

In those rare cases where projects have been unable to move forward for a variety of individual reasons the Department has established a system to efficiently terminate projects and return these funds to the US Treasury. While the DOE is proactive in its monitoring of funding recipients, and setting clear milestones to help recipients execute their projects, some recipients are ultimately unable to meet the agreed upon plan and have requested the contract be terminated. The Department's system also closely monitoring projects for any waste, fraud and abuse and retains the authority to terminate such contracts if in violation, or if a project fails to meet technical or performance milestones.

The Energy Efficiency and Conservation Block Grant (EECBG) Program made available \$2.7 billion in formula grants and \$454 million in competitive grants to US states,

territories, local governments, and Indian tribes to improve energy efficiency and reduce energy use and fossil fuel emissions in communities. To improve oversight of EECBG funds, DOE required cities and counties to develop energy-efficiency plans for the first time to receive funding. Many of these local governments had not previously participated in funding programs of this nature. As may be expected with participation in a new program, some EECBG grantees were slower to start moving forward than others.

To date, this program paid out over \$2 billion (over 70% of total EECBG funds) and expects to be fully spent by the end of FY13.

The EECBG program has been among the largest job creators under the Recovery Act. The success of this program at the local level holds the potential to create a vibrant long-term market in energy efficiency throughout the country. It is helping local communities, homeowners and businesses to save money and energy and reduce our reliance on imported oil.

## QUESTION FROM RANKING MEMBER MURKOWSKI

### obligated Balances

1. Please provide a full and detailed list of all unobligated balances for every program and account at the Department of Energy
4. The Department's unobligated balances as of April 30, 2012 are as follows



### Base Financial Report PY Approp Unobligated, April 2012

	PY Approp Un obl iga te d
<b>CC Grouping</b>	
<b>DOE Total</b>	<b>7,852,665</b>
<b>NNSA Total</b>	<b>61,482</b>
<b>NNSA-WA Total</b>	<b>20,159</b>
02-D-103 Project Engineering and Design, Various Locations	42
02-D-105 Engineering Technology Complex Upgrade (ETCU), LLNL	50
03-D-102 National Security Sciences Building, LANL	84
05-D-160 FIRP Project Engineering and Design, Various Locations	0
06-D-160 FIRP Project Engineering and Design, Various Locations	0
06-D-402 NTS Replace Fire Stations No. 1 and No. 2, NTS	4,101
06-D-601 Electrical Distribution System Upgrade, Pantex	0
06-D-603 Steam Plant Life Extension Project, Y-12	0
88-D-123 Security Enhancements, Pantex Plant	0
96-D-111 National Ignition Facility, LLNL	0
99-D-141-010 Pit Disassembly and Conversion Facility, SRS	0
Advanced Certification	96
Advanced Design and Production Technologies	134
Advanced Radiography	15
Advanced Simulation and Computing Campaign	222
Congressionally Directed Projects - Weapons Activities	32
Cyber Security	732
Defense Nuclear Security	1,190
Dynamic Materials Properties	138
Dynamic Plutonium Experiments	13
Energy Modernization and Investment	5
Enhanced Surety	2
Enhanced Surveillance	13
Environmental Projects and Operations	532
Facilities and Infrastructure Recapitalization Program	214
Facility Operations and Target Production	20
High Explosives and Weapon Operations	15
High-Energy Petawatt Laser Development	9
Ignition	45



Inertial Fusion Technology	18
Joint Program in High Energy Density Laboratory Plasmas	7
Life Extension Programs	372
Material Recycle and Recovery	350
NIF Demonstration Program	0
NIF Other Project Costs	0
National Security Analyses, Assessments, and Technologies	68
Nonnuclear Readiness	26
Nuclear Counterterrorism Incident Response	499
Operations of Facilities	53
Operations of Facilities - Institutional Site Support	2,578
Operations of Facilities - Kansas City Plant	1
Operations of Facilities - Lawrence Livermore National Laboratory	5
Operations of Facilities - Los Alamos National Laboratory	1,104
Operations of Facilities - Nevada Test Site	209
Operations of Facilities - Y-12 National Security Complex	197
Pit Manufacturing Capability	31
Primary Assessment Technologies	12
Program Readiness	12
Pulsed Power ICF	2
STA Operations and Equipment	912
STA Program Direction - Federal Support	2,318
Special Projects	20
Stockpile Readiness	13
Stockpile Services	1,348
Stockpile Systems	2,043
Support of Stockpile Program	1
Test Readiness	9
Tritium Readiness	50
University Grants/Other Support	2
W88 Pit Manufacturing	49
Warheads Dismantlement	116
Weapons Systems Engineering Assessment Technology	29
<b>NNSA-NN Total</b>	<b>33,578</b>
00-D-192 Nonproliferation and International Security Center	6
99-D-141-010 PDCF, SRS	1,400
Accelerated Highly Enriched Uranium Disposition	3
Elimination of Weapons Grade Plutonium Production in Russia	2,059
Global Initiative for Proliferation Prevention	357
Global Threat Reduction Initiative	331
HEU Transparency Implementation	0
International Nuclear Materials Protection and Cooperation	20,871
International Nuclear Safety and Cooperation	47
Nonproliferation And Verification Research And Development	475
Nonproliferation and International Security	1,020
Russian Surplus Plutonium Disposition	0
Supporting Activities	0
U.S. Plutonium Disposition	7,001
U.S. Support and Oversight	10

<b>NNSA-NR Total</b>	<b>4,125</b>
05-N-900 Materials Development Facility Building, Schenectady, NY	9
06-D-901 Central Office Building 2, BAPL	27
08-D-901 Shipping and Receiving and Warehouse Complex	14
Naval Reactors Development	1,111
Naval Reactors Program Direction	2,964
<b>NNSA-OA Total</b>	<b>2,794</b>
Program Direction - National Nuclear Security Administration - Office of the Administrator	2,794
Spectrum Relocation Funds	1
<b>NNSA-Other Total</b>	<b>826</b>
01-D-701 Site-Wide Fire Alarm System Replacement, LANL	8
01-D-702 Emergency Operations Center Replacement and Relocation, LANL	0
01-D-705 Multi-Channel Communications Systems, LANL	44
97-D-102 Dual-Axis Radiographic Hydrotest Facility (DARHT), LANL	0
Emergency Preparedness	43
Emergency Response	0
Nuclear Security/Russian Production Reactor Shutdown Program	1
Physical Damage, Destruction Repair, and Risk Mitigation	274
Restoring Services	451
Resuming Laboratory Operations	5
<b>Energy Total</b>	<b>3,112,965</b>
<b>EERE Total</b>	<b>116,987</b>
Biofuels: Transportation	2
Biomass and Biorefinery Systems R&D	34
Biomass/Biofuels Energy Systems	2,840
Building Technologies	14,462
Congressionally Directed Projects - Energy Efficiency and Renewable Energy	9,160
Department Energy Management Program	2
Distributed Energy Resources	97
Energy Efficiency and Renewable Energy (EERE) Program Support	3,023
FEMP Program Direction	1
Federal Energy Management Program	1,386
Federal Facility Energy Efficiency	363
Fuel Cell Technologies	351
Gateway Deployment	1,217
Geothermal	1,479
Hydrogen Research R&D	7,195
Hydrogen and Fuel Cells Technologies	19
Hydropower	0
Industry Sector - Total	30,566
Intergovernmental Activities	311
NREL South Table Mountain Infrastructure	3
Other State Energy Activities	639
Policy And Management	48
Solar & Renewable Resources Technology Program Direction	6,850
Solar Energy	23,965
State Energy Program (Grants)	5,860
State Energy Programs	0
Training and Technical Assistance	69

Tribal Energy	307
Vehicle Technologies	973
Water Power Energy R&D	842
Weatherization Assistance	2,916
Weatherization Assistance Program	3
Weatherization Assistance Program (Grants)	168
Weatherization and Technical Assistance	32
Wind Energy Systems	1,805
<b>OE Total</b>	<b>13,311</b>
Clean Energy Transmission & Reliability	1,847
Cyber Security for Energy Delivery Systems	0
Cyber Security for Energy Delivery Systems R&D	565
Distributed Energy	151
Electric Distribution Transformation R&D	17
Electricity Restructuring	0
Energy Assurance and Security	7
Gridwise	44
High Temperature Superconductivity R&D	3
Infrastructure Security & Energy Restoration	269
Permitting, Siting and Analysis	115
Program Direction	8,523
Smart Grid Research & Development	1,617
Transmission Reliability R&D	95
Visualization & Control	57
<b>FE Total</b>	<b>2,925,014</b>
Advanced Metallurgical Processes	44
Advanced Research	215
Advanced Systems - Combustion Systems	96
Advanced Systems - Indirect Fired Cycle	193
Advanced Systems - Integrated Gasification Combined Cycle	1,970
Black Liquor Gasification Technologies	17
Clean Coal Power Initiative	61,566
Clean Coal Program Direction	149
Coal Utilization Science	158
Congressional Directed Projects - Advanced Research	370
Congressional Directed Projects - Fuel Cells	0
Congressional Directed Projects - Fuels	121
Congressional Directed Projects - Petroleum Reserves	0
Congressional Directed Projects - Fossil Energy	260
Effective Environmental Protection	86
Emerging Processing Technology Applications	13
Expansion Activities	0
Exploration And Production	876
Field Program Direction - FE	4,611
Fossil Energy Environmental Restoration Fossil Energy Environmental Restoration	1,247
Fossil Energy Program Direction	6,549
Fuel Cell Systems	6
FutureGen	680
Gas Hydrates	112

General Plant Projects	217
Greenhouse Gas Control	672
Historically Black Colleges And Universities (Hbcus), Education And Training	171
Import/Export Authorization	539
Infrastructure	25
Innovations for Existing Plants	1,357
Innovative Clean Coal Technology	4,767
Innovative Concepts	117
Loan Guarantee Default Reserve	1
Materials And Components	69
NETL Coal R&D Direct Program Direction	1,044
Naval Petroleum and Oil Shale Reserve Program Direction	13
Petroleum Acquisition And Transportation	2,743,259
President's Hydrogen from Coal Research Fuels	510
Production & Operations	1,317
Program Management	6
Reservoir Life Extension/Management	451
Solid Fuels and Feedstocks	96
Special Recruitment Programs	161
Storage Facilities Development	88,682
Strategic Petroleum Reserve Management	363
Technology Crosscut	96
Transportation Fuels and Chemicals	546
Turbines	219
Ultra Clean Fuels	114
Ultra Deep Water and Unconventional National Gas and Other Petroleum Resources	806
Unconventional Fossil Energy Technologies	1
University Coal Research	53
Utah Center for Ultra Clean Coal Utilization	0
<b>NE Total</b>	<b>24,369</b>
Accelerator Transmutation Of Waste	0
Advanced Fuel Cycle Initiative (AFCI)	579
Advanced Radioisotope Power Systems	3
Advanced Reactor Concepts (ARC)	242
Advanced Reactor R&D	72
Breeder Reactor Technology	7
Civilian Radioactive Waste Management - Program Direction	7,100
Crosscutting Technology Development	1,161
FAC MODS FOR U233 DISPOSITION	0
Facilities	0
Generation IV Nuclear Energy Systems Initiative (Generation IV)	306
INL Operations and Infrastructure	62
Integrated Spent Fuel Cycle	384
International Nuclear Energy Cooperation	50
Light Water Reactor (LWR) Sustainability	204
Los Alamos Nuclear Infrastructure	1
MOX Other Project Costs	3
Next Generation Nuclear Plant (NGNP) Demonstration Project	1,356
Nuclear Energy Research Initiative	36

Nuclear Energy Technologies	411
Nuclear Hydrogen Initiative (NHI)	152
Nuclear Technology Research And Development	0
Plutonium Burning	0
Program Direction - Nuclear Energy	4,376
Research Reactor Infrastructure	87
Safeguards and Security - Nuclear Energy	8
Small Modular Reactors	83
Space and Defense Nuclear Power Systems Infrastructure Maintenance	150
State Dept. Funded International Nuclear Safety Activities	-3,492
University Reactor Fuel Assistance and Support	116
Waste Management System	10,910
<b>EM Total</b>	<b>27,575</b>
A-D Waste Treatment & Immobilization Plant - Subprojects A-D	67
Central Plateau Remediation	493
Defense ER&WM - Multi-Site Activities	8
Defense Environmental Cleanup - Closure Sites	2,387
Defense Environmental Cleanup - Program Support	749
Defense Environmental Cleanup - Safeguards and Security - Environmental Management	9
Defense Environmental Services - Federal Contribution to the Uranium Enrichment Decontamination and Decommissioning Fund	0
Defense Environmental Services - Non-Closure Environmental Activities	110
Defense Environmental Services - Program Direction	7,405
Defense Site Acceleration Completion - 2012 Accelerated Completions	84
Defense Site Acceleration Completion - Safeguards and Security -Environmental Management	0
Defense Site Acceleration Completion - Technology Development and Deployment	923
East Tennessee Technology Park	678
HQ-CDP-0100, Congressionally Directed Activities - Environmental Management	314
HQ-CDP-0100-N: Congressionally Directed Projects	7
Headquarters	58
Idaho Cleanup and Waste Disposition	235
NDEC - Small Sites	268
NNSA Sites and Nevada Off-Sites	609
Non-Defense Environmental Cleanup - Gaseous Diffusion Plants	26
Non-Defense Environmental Cleanup - West Valley Demonstration Project	450
OR-0011Z Downbend of U-233 in Building 3019	330
OR-0031 Soil and Water Remediation - Off-Sites	4
OR-0041 Nuclear Facility D&D - Y-12	17
OR-0100 Oak Ridge Reservation Community and Regulatory Support	2
ORP-0014 Radioactive Liquid Tank Waste Stabilization and Disposition	782
PED-08-01 Plutonium Vitrification Facility	3,925
Paducah Gaseous Diffusion Plant	27
Portsmouth Gaseous Diffusion Plant	1,520
Project Engineering and Design, Salt Waste Processing Facility Alternative, SR	4,800
Project Engineering and Design, Sodium Bearing Waste, Idaho	37
RL-0011 Nuclear Material Stabilization and Disposition - PFP	54
RL-0013C Solid Waste Stabilization and Disposition - 2035	37
RL-0030 Soil and Water Remediation - Groundwater/Vadose Zone	235
RL-0040 Nuclear Facility D&D - Remainder of Hanford	1,263
RL-0041 Nuclear Facility D&D - River Corridor Closure Project	604

RL-0100 Richland Community and Regulatory Support	30
River Corridor and Other Cleanup Operati	0
SR-0014C Radioactive Liquid Tank Waste Stabilization and Disposition	1,182
SR-0101 Savannah River Community and Regulatory Support	0
Sales of Uranium	0
Salt Waste Processing Facility, SR	0
Savannah River Site - Site Risk Manageme	-2,176
Waste Isolation Pilot Plant	20
<b>LM Total</b>	<b>5,709</b>
Legacy Management Activities - Defense	1,518
Legacy Management Activities - Non-Defense	156
Program Direction	3,729
Worker and Community Transition Activities	305
<b>Science Total</b>	<b>16,958</b>
<b>SC Total</b>	<b>16,958</b>
Advanced Light Source (ALS), User Support Bldg (USB) - LBNL	3
Advanced Scientific Computing Research	1,168
Basic Energy Services	8,388
Biological And Environmental Research	1,701
Congressionally Directed Projects - Science	83
Converted Cumulative Balance	37
Fusion Energy Sciences	268
High Energy Physics	249
Infrastructure Support	36
Unac Coherent Light Source	26
Multiprogram Energy Laboratory	0
Nuclear Physics	624
Oak Ridge Landlord	4
Office of Science - Program Direction	3,414
PED Photon Ultrafast Laser Science & Engineering (PULSE) Big Renovation	0
PED, ALS, User Support Bldg	0
Research, Development And Operations	0
Safeguards and Security - Science	9
Science Laboratories Infrastructure	0
Small Business Innovation Research	584
Small Business Technology Transfer Pilot Research	41
Workforce Development for Teachers and Scientists	322
<b>ARPA-E Total</b>	<b>157,286</b>
<b>ARPA-E Total</b>	<b>157,286</b>
ARPA-E Projects	155,051
Program Direction	2,234
<b>Loan Total</b>	<b>4,396,414</b>
<b>ATVM Total</b>	<b>4,396,288</b>
Loan Guarantee Original Subsidy	4,224,341
Vehicle Manufacturing Loan Program	1,947
<b>LGPO Total</b>	<b>126</b>
Loan Guarantee Original Subsidy	170,000
Loan Guarantee Program	126
<b>HQ Support Total</b>	<b>38,279</b>
<b>OSE Total</b>	<b>1,505</b>

Office Of The Secretary - Program Direction	1,505
<b>CIO Total</b>	<b>2,253</b>
<b>CHIEF INFORMATION OFFICER - INFORMATION MANAGEMENT</b>	<b>1,400</b>
Corporate Management Information Program	89
Cyber Security Program	83
Energy Information Technology Services (EITS)	681
<b>CFO Total</b>	<b>504</b>
Office of the Chief Financial Officer - Program Direction	504
<b>MA Total</b>	<b>4,414</b>
Competitive Sourcing Initiative	71
Office of Management Program Direction	4,343
<b>HC Total</b>	<b>36</b>
Office of Human Capital Management Program Direction	36
<b>HG Total</b>	<b>632</b>
Office Of Hearings And Appeals	632
<b>CI Total</b>	<b>2,758</b>
Congressional & Intergovernmental Affairs - Program Direction	1
Congressional & Intergovernmental Affair	2,757
<b>IE Total</b>	<b>1,465</b>
Indian Energy Policy & Programs	340
Office of Indian Energy Policy & Program	1,125
<b>PA Total</b>	<b>511</b>
Public Affairs - Program Direction	511
<b>GC Total</b>	<b>333</b>
ES&H Program Direction - GC - Energy Supply	40
General Counsel - Program Direction	292
<b>PI Total</b>	<b>528</b>
Climate Change Technology Program	48
Emergency Planning	51
International Policy Studies	3
Office Of Environmental Analysis	102
Office of International Affairs - Program Direction	303
Policy, Planning And Analysis	21
<b>ED Total</b>	<b>1,564</b>
Economic & Impact Diversity - Program Direction	1,381
Minority Economic Impact Program	183
<b>IG Total</b>	<b>10,986</b>
Office of Inspector General - Program Direction	10,986
<b>HSS Total</b>	<b>10,790</b>
Counterintelligence	2
Defense Vulnerability and Threat	3
Employee Compensation Initiative	148
Energy Supply (Operating)	3
Energy and Proliferation	777
Environmental, Safety and Health Operating Expenses - HS - Other Defense	1,566
Intelligence	6
Nuclear Safeguards and Security	750
Operations And Support	0
Other Defense Activities (Operating)	74

Program Direction	4,996
Program Direction - ES&H	0
Program Direction - HSS	1,089
Program Direction - Office of Security	8
Program Direction - Office of Vulnerability and Threat	1
Security Investigations	322
Vulnerability and Threat Program Activity	1,045
<b>EIA Total</b>	<b>750</b>
<b>EIA Total</b>	<b>750</b>
National Energy Information System (Neis)	750
<b>PMA Total</b>	<b>68,531</b>
<b>SEPA Total</b>	<b>364</b>
Continuing Fund	50
Program Direction	314
<b>SWPA Total</b>	<b>300</b>
Continuing Fund	300
Program Direction	0
Spectrum Relocation	0
<b>WAPA Total</b>	<b>67,867</b>
Construction And Rehabilitation	9,244
Emergency Fund - Wapa	500
Falcon And Amistad Operation And Maintenance	213
Program Direction	6,343
Spectrum Relocation	47,555
System Operation And Maintenance	4,011

**CC Grouping** More detail is provided at the Congressional Control level.

**PY Approp Unobligated** All appropriated funds that have not been obligated from prior fiscal years (Source: FDS/STARS = PY Available minus Current Year Obligated Less PY Adjustment for prior year appropriated funds).

**Blue Subtotal** line Subtotal at the Under Secretary level.

**Green Subtotal** line Subtotal at the Organizational level.

**Column/row with a 0 or -0** is money that is between 500 and -500.

**Column/row with a blank space** (no data) is truly a 0 amount.



## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Weatherization**

**Q35.** I know that looking at weatherization funding is complex given that the funding levels are still being affected by the large amount of money given to states, nearly \$5 billion, in the economic stimulus bill in spring 2009. Still, given the benefits of weatherization as far as the amount of energy it saves, and given the Department's priorities to fund commercial energy efficiency programs, I am a bit confused by the budget that calls for weatherization funding of \$195 million – still \$36 million below 2011 and \$135 million below the Department's former goal of trying to make about \$325 million available for weatherization a year. My home State of Alaska, for example, is proposed to get \$200,000 less than in FY 11, even though there are still tens of thousands of homes that would save more than \$550 a year per household in energy costs from such energy efficiency efforts. Why did weatherization not rate a higher priority in the Administration's thinking?

**A35.** The Weatherization Assistance Program (WAP) remains a priority for the Department of Energy. The \$195 million funding request made by the Department in 2013 is a combination of three programs: Weatherization Assistance Program - \$139 million; State Energy Program - \$49 million; and Tribal Energy program - \$7 million, which will help to reduce energy costs for families across the country.

### **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q36.** Please describe how your Department allocated FY2012 funding under the weatherization program to each state. If a State did not receive a FY2012 please describe the reasons for withholding funding.

**A36.** The 2012 Consolidated Appropriations Act provided \$65 million for allocation to Weatherization Assistance Program (WAP) grantees - a funding level that is less than one-third of the amount provided in the 2011 Appropriations for the Program. Congress also provided the Secretary of Energy with the authority to use an alternate methodology other than the formula established in regulation to distribute the available funding – taking into consideration unspent balances from the American Recovery and Reinvestment Act of 2009 (ARRA) and other DOE resources available to grantees in 2012. The Secretary exercised this authority and allocated program year (PY) 2012 funds to ensure two major outcomes: 1) grantees that spent their ARRA funds on time have adequate DOE funds to maintain their operations at pre ARRA levels; and 2) all grantees have adequate funds to operate throughout PY 2012, given the fund balances that are already allocated but remain unspent. The allocations were based on the following criteria:

- Use of an appropriation amount of \$210 million as the base “PY12 Target Allocation” for establishing funding for each grantee. This is the amount that would have been awarded to grantees through the funding formula as established in the regulations based on a \$210 million Appropriation by Congress in 2010.
- Whether a significant portion of the “PY12 Target Allocation” was available in ARRA balances for at least half of the PY 2012. PY 2012 “Target Allocations” were

adjusted downward for grantees with significant ARRA balances.

- Whether more than the adjusted “PY12 Target Allocation” is expected to be available at the start of the grantee’s PY 2012. Grantees with a prior year balance totaling more than the adjusted “PY12 Target Allocation” did not receive FY 2012 funding.
- Allocation of PY 2012 funds was provided to those grantees requiring additional DOE funds to reach their adjusted “PY12 Target Allocation”. This allocation was equal to 76.38 percent of the adjusted “Target Allocation” - the proportional share of the \$65 million Appropriation relative to the sum of the adjusted target allocations.

The only reason why a grantee would not have received funds in 2012 is that sufficient unspent ARRA and/or DOE Appropriated funds from previous years still remained available for use in 2012.

### **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q37. Please briefly describe the reports that have been issued by the Office of the Inspector General at the Department of Energy that have found instances of waste, fraud and abuse under ARRA for the weatherization program. In addition, please describe actions that DOE will be taking with regard to each of the IG's recommendations stemming from these reports.**

**A37. More than \$5 billion of funding from American Recovery and Reinvestment Act of 2009 (ARRA) has been administered through the Weatherization Assistance Program (WAP). The use of these funds to weatherize low income homes has been the subject of 28 audits covering grantees representing \$3.9 billion or 78% of the Recovery Act portfolio. These audits were conducted by the DOE Office of Inspector General (OIG) and the Government Accountability Office (GAO). Of the 28 audits, 17 are complete and 11 are ongoing.**

**The majority of the completed audit reports (14 of 17) contained no significant findings. Of the remaining three reports, findings included evidence of substandard performance in workmanship, initial home assessments, contractor billing, financial management, and compliance with laws and regulations, including Davis-Bacon and Historic Preservation issues.**

**As part of DOE's regular monitoring and oversight responsibilities, the Department systematically identifies and responds to new or on-going compliance issues created as a result of the large increase in WAP activities under ARRA funding. All of the WAP grantees take part in regular phone call updates and have been visited on a routine basis,**

with a total of 121 Monitoring Site Visits conducted by program staff through December 2011. Any issues identified are tracked and addressed until corrected.

DOE monitoring efforts identified these issues prior to the OIG audits and actions have already been taken to address them. It is worth noting that some of these requirements, such as those related to the Davis-Bacon Act, were previously not applicable to the WAP but have now been integrated into the Program.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Energy Star**

- Q38. Please identify DOE's role in this program, and the amount of funds expected to be allocated to the Energy Star Program. In addition, please describe your coordination efforts with the EPA as it relates to Energy Star implementation.**
- A38. DOE is the lead for the development of product test procedures and technical support of the verification testing program for the ENERGY STAR program. DOE remains committed to working with EPA and stakeholders in terms of creating and updating ENERGY STAR test procedures that are reflective of innovations in the market place and that address manufacturers concerns with test procedures. As an example, DOE and EPA are working closely with industry associations and major refrigerator manufacturers in the development of test procedures to support Smart Grid capability in ENERGY STAR refrigerators. In FY 2012, DOE's budget for ENERGY STAR was a total of \$7 million. With those funds, DOE developed test procedures for the ENERGY STAR program that manufacturers must use when qualifying their products for the ENERGY STAR program and conducted a variety of activities geared toward verifying the performance of ENERGY STAR labeled products through third-party laboratory testing. This information and data are provided to EPA on an ongoing basis, as they are responsible for managing the ENERGY STAR brand.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Advanced Manufacturing Program**

**Q39. Last year your Department changed the name of the Industrial Technologies Program to the Advanced Manufacturing program. Within the FY 2013 budget you have requested a 150.9% increase above the appropriated FY 2012 levels. Please describe the changes that you anticipate with the new program, along with how you intend to allocate funding for each of the different components of the Advanced Manufacturing Program**

**A39. The work of the Advanced Manufacturing Office (AMO) is focused around several major program activities: 1) The Innovative Manufacturing Initiative (IMI), 2) Manufacturing Demonstration Facilities (MDF), and 3) the Energy Innovation Hub for Critical Materials. Each of these is described further below.**

- 1. The Innovative Manufacturing Initiative (IMI) will support competitively selected, industry-led cost-shared technology projects within broadly identified priority technology domains. Industry response to the IMI solicitation was widespread and diverse. AMO received 1,408 total Letters of Intent. Due to this strong industry response, awards will be highly competitive, but the eagerness of so many companies – 78% of whom were small enterprises – to put significant sums of their own money toward these cost-shared projects speaks to the high level of demand for this type of public-private partnership.**

**The \$51.2 million in support for projects selected through the IMI solicitation during FY2012 is split approximately equally between FY11 and FY12 funding.**

- 2. The Manufacturing Demonstration Facilities (MDFs) are intended to create collaborative, shared infrastructure around targeted technical areas that will facilitate**

the development and utilization of energy efficient, rapid, flexible manufacturing technologies and to promote broad and rapid dissemination of manufacturing technologies. Two MDFs will be established around foundational keystone technologies that strongly affect techno-economic systems such as low-cost carbon fiber, out-of-the-autoclave composites, wide band gap semi-conductor materials, and other industry-identified priority areas.

The MDF's will serve a number of valuable functions. They will provide manufacturers and product developers access to physical and virtual tools from design to evaluation for rapidly prototyping new technologies and optimizing critical manufacturing processes. They will also guide and train users and maintain infrastructure with a staff of designers, manufacturing experts and product evaluators. In addition, the MDFs will act as a center for education and training, hosting interns and representatives from industry, academia and government.

3. The DOE Energy Innovation Hubs aim to foster innovation through a unique approach, where scientists and engineers from many disciplines work together to overcome the scientific barriers to cutting-edge energy technologies in specific topic areas. In this environment, the researchers can accomplish greater feats more quickly than they would separately. DOE's goal for the Hub is to create a coherent, full spectrum research team focused on conducting basic and applied research, development, and demonstration (RD&D) to reduce criticality for existing materials and prevent criticality of new materials that are essential to modern and emerging



energy technologies. DOE has released a Funding Opportunity Announcement for the Critical Materials Hub and selection is expected by the end of 2012. In the 2013 budget request, AMO request \$20M for this Hub. It is expected that AMO will request \$25M annually for the Hub in FY 2014 - 2016.

Specific funding allocations for the various activities conducted through AMO will depend upon the availability of funds.

## QUESTION FROM RANKING MEMBER MURKOWSKI

### **Building Technologies Program**

**Q40.** The Building Technologies Initiative request is increased substantially, by 41.4% over the FY 2012 budget. Please describe how much you intend to allocate for each of the components within this Program. In addition, please describe how you intend to ensure that the Program's progress is coordinated with the other EERE programs, including: the Solar Technologies Program, the Weatherization and Intergovernmental Program, and the Federal Energy Management Program.

**A40.** The allocation for each of the components within the Building Technologies Program is shown below:

	(Dollars in Thousands)		
	FY 2011 Current <sup>a</sup>	FY 2012 Enacted	FY 2013 Request
<b>Building Technologies Program</b>			
Commercial Buildings Integration	37,308	31,913	61,079
Emerging Technologies	75,694	84,765	108,344
Equipment and Buildings Standards	35,000	58,246	98,250
Residential Buildings Integration	37,308	31,282	35,872
Technology Validation and Market Introduction	22,000	8,500	0
SBIR/STTR	0	4,498	6,455
<b>Total, Building Technologies Program</b>	<b>207,310</b>	<b>219,204</b>	<b>310,000</b>

<sup>a</sup> SBIR/STTR funding transferred in FY 2011 \$3,190,000.

The Building Technologies Program (BTP) is continually working on enhanced collaboration with other EERE organizations, including cross program "details" of staff, and jointly developed programs and results. Examples include:

- BTP is currently participating on a number of EERE crosscutting teams to coordinate activities including a team on advanced manufacturing for lighting, technology deployment and workforce.
- Building Integrated Photovoltaic (BIPV) in conjunction with the Solar Energy Program to explore the impact of roof-top PV systems on thermal management in buildings and

**develop solutions to mitigate additional cooling loads that might result from a BIPV system;**

- **Technology screening verification and technology demonstrations for the Federal and private sector with the Federal Energy Management Program;**
- **Development of energy audit tools, workforce standards and certification, residential retrofit strategies with the Weatherization and Intergovernmental Program; and**
- **Superior Energy Performance (SEP) and Global Superior Energy Performance (GSEP) Program with the Advanced Manufacturing Office. These are voluntary certification programs that provide commercial buildings and industrial facilities with a pathway for achieving continual improvement in energy efficiency and for documenting their achievements.**

### **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q41. Please describe how you intend to reduce building-related energy costs by reducing energy use by 50% by 2030. What are the projected incremental costs to the Department to fund these initiatives that could lead to a 50% reduction in building related energy use by 2030?**

**A41. BTP will pursue several key activities to reduce energy use by fifty percent.**

- The Equipment Standards and Analysis program will increase the scope and effectiveness of its energy conservation standards by accelerating the test procedures and standards rulemakings, allowing for the increased use of DOE's existing authorities to establish standards for additional products that have large energy savings potential. The program will also actively monitor and enforce all DOE energy conservation and water conservation standards through product testing and it will continue to initiate investigations into any detected non-compliance. DOE will also continue working with the Environmental Protection Agency to update and/or create test procedures for the ENERGY STAR program to use for those products that have the potential to save the most energy.
- The Emerging Technologies program will be focused on conducting additional new FOAs in the areas of HVAC; building envelope and windows; sensors and controls; and solid state lighting manufacturing. Additional research will include projects to improve building systems operations with innovative sensors for temperature, humidity, air flow, motion/occupancy, and light level.
- The Commercial Buildings Integration program will conduct demonstrations of commercial building retrofits critical to achieving BTP's goal of reducing building related energy use by 50 percent cost effectively, as well as increasing

deployment of technical specifications and demonstration of cost effective retrofits. Commercial Buildings Integration will also work jointly on a competitive solicitation with Emerging Technologies with a focus on building envelope and windows, and one on sensors and controls with the intent to better align the technologies with market opportunities to improve ongoing building energy use.

- The Residential Buildings Integration program will greatly expand their research, including integrating new technologies into existing homes. It will continue to identify and develop the most cost effective measures and enable/demonstrate the cost effectiveness and reliability of systems required to meet the International Energy Conservation Code (IECC) 2012 code revision. In addition, the Building America Program will expand their research into achieving 50 percent energy efficiency savings in residential buildings over IECC 2009. These goals are targeted for completion for all climate zones by 2017.
- The Building Code program will build upon prior year activities to achieve the 50 percent upgrade of the IECC and ASHRAE 90.1 and provide significant technical assistance to States for code adoption and compliance.

DOE will continuously seek to identify opportunities and prioritize activities to meet the proposed 50 percent goal, and seek input from stakeholders throughout this process.

**QUESTION FROM RANKING MEMBER MURKOWSKI**

**HOMESTAR Initiative**

**Q42.** The budget continues to recommend the introduction and the enactment of the HOME STAR Efficiency Program. However, as of yet the President has not sent the Congress bill language.

What is your estimation on how much this program would cost? Will the Administration be sending Congress a legislative proposal on this initiative?

**A42.** As proposed in 2010, HOMESTAR would establish a \$6 billion rebate program, which would provide rebates to consumers to encourage immediate investment in energy-efficient appliances, building mechanical systems and insulation, and whole-home energy efficiency retrofits.

## QUESTION FROM RANKING MEMBER MURKOWSKI

### Federal Energy Management Program (FEMP)

Q43. Since 2006 you estimate that FEMP has saved Federal facilities over \$5 billion in energy costs. Can you provide us a list of the projects, and their associated savings, that you used to arrive at the \$5 billion in savings?

A43. Between FY 2006 and FY 2012, 126 DOE ESPC delivery orders and task orders have been awarded with more than \$1.7 billion having been invested in Federal energy efficiency and renewable energy improvements. These improvements have resulted in more than 210 trillion Btu life-cycle energy savings and more than \$5.1 billion of cumulative energy cost savings.

	Project	Project Investment	Contract Price	Guaranteed Cost Savings	Annual Energy Savings (btu x 10 <sup>6</sup> )	Cumulative Energy Savings (btu x 10 <sup>6</sup> )
Total for FY 2006	22	\$163,960,554	\$404,786,831	\$410,192,500	1,233,397	22,143,688
Total for FY 2007	15	\$149,177,735	\$366,600,406	\$371,703,394	957,303	16,206,513
Total for FY 2008	21	\$293,469,669	\$734,130,687	\$756,653,562	1,805,188	34,187,748
Total for FY 2009	23	\$397,338,861	\$1,331,589,161	\$1,493,828,946	4,681,992	86,523,921

2009						
Total for FY 2010	37	\$528,378,174	\$1,143,420,524	\$1,162,276,810	2,598,197	42,882,708
Total for FY 2011	7	\$252,650,259	\$916,119,421	\$916,419,640	418,087	7,952,004
Total for FY 2012	1	\$1,896,507	\$9,336,022	\$9,436,576	7,740	154,800
Grand Total	126	\$1,786,871,759	\$4,905,983,052	\$5,120,511,428	11,701,904	210,051,382

Link to FEMP data: [http://www1.eerc.energy.gov/femp/financing/espcs\\_awardedcontracts.html](http://www1.eerc.energy.gov/femp/financing/espcs_awardedcontracts.html)



## **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q44.** Please describe how you intend to fully utilize your existing authorities to obtain additional energy savings at Federal facilities (EPSCs, USECs, PPAs, etc). In addition, please describe the specific authority, and projected cost of each project that you are likely to pursue to meet energy savings.

**A44.** The Federal agencies have set targets for utilizing these private investment tools to support the December 2, 2011 Presidential Memorandum, which calls on the Federal government to enter into \$2 billion worth of energy efficiency performance-based contracts by December 2013. DOE has contracts, training, and technical resources in place to assist with this full utilization.

The specific authorities vary by contract type but include the following:

- ESPCs are authorized by 42 USC 8287 et seq. for all agencies to enter into these contracts.
- USECs are authorized by 42 U.S.C. 8256, for all civilian agencies, to enter into these contracts. DoD has specific authority to enter into USECs.
- PPAs are codified by 40 U.S.C. 501, for all civilian agencies, to enter into these types of agreements. PPA's are codified by 10 U.S.C. 2922 for DOD.

FEMP developed a 12-month timeline to guide agencies step-by-step, and month-by-month towards achieving their targets and commitments using FEMPs multi-award ESPC. On average ESPC projects are about \$15 million; however, the costs of these projects are likely to vary among agencies. Since these contracts are paid from savings, there is not an

increased cost to government. FEMP is working with CEQ and OMB to track agencies progress in achieving the \$2 billion target on a monthly basis.

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### **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q45. If a Federal agency pursues an energy savings initiative, are they required to consult with FEMP?**

**A45. Federal agencies are not required to consult FEMP prior to pursuing energy savings initiatives, but highly encouraged to do so as FEMP has resources to assist with their energy savings initiatives, including services, tools, and expertise to help them achieve their Federal energy management goals and ESPC targets.**

There are several statutory requirements for federal agencies to report on energy conservation measures and performance that is coordinated by FEMP. For instance, agencies are required to complete energy evaluations of their existing facilities, identify potential energy conservation measures and report those findings to FEMP annually, per §432 of the Energy Independence and Security Act (42 USC §8253(f)). Section 8253, Energy Management Requirements, requires FEMP to develop and manage an online tracking system, the EISA Section 432 Compliance Tracking System (CTS), to track agency performance of energy and water evaluations, project implementation and follow-up measures, and annual building benchmarking requirements.

In addition, Federal agencies are required by §548(a) of the National Energy Conservation Policy Act (NECPA (42 U.S.C. 8258(a))) to report annually to FEMP certain energy management activities. Information and data collected from the agencies is then used to develop DOE's Annual Report to Congress on Federal Government Energy Management as well as the OMB Scorecards used to inform Congress and the public of federal energy management efforts.

### **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q46. Please describe how you intend to reinvigorate the Federal Energy Efficiency Fund. What types of projects do you envision being funded under this initiative?**

**A46. Similar to DOD's Energy Conservation Investment Program, through the Federal Energy Efficiency Fund, in FY13 FEMP intends to provide direct funding and leveraged cost-sharing for Federal civilian agencies for capital projects and other initiatives to increase the energy efficiency, water conservation and renewable energy investments at agency facilities. Grants from the Fund would be awarded after a competitive assessment of the technical and economic effectiveness of each agency proposal. The types of projects that would be funded under this initiative include a broad range of energy efficiency, renewable and water technologies such as lighting upgrades, solar energy, geothermal heat pumps, metering, commissioning, and wind power.**

**Criteria for a project award under the Federal Energy Efficiency Fund include the amount of energy and cost savings anticipated to the Federal Government, amount of funding requested by the agency, and the extent that a proposal leverages financing from other non-Federal sources.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q47. FEMP is directed to assist agencies in meeting the goals set forth in the Presidential Memorandum on Performance Contracting (December 2, 2011). In the memo, Federal agencies are tasked to enter into a minimum of \$2 billion in performance-based contracts in Federal building energy efficiency within 24 months. Please describe how you intend to meet this goal.**

**A47. FEMP has a number of established tools and systems currently in place to assist Federal agencies which are ultimately responsible for executing projects in support of this goal.**

**Those tools include an Indefinite Delivery, Indefinite Quantity multiple award (IDIQ) contract with 16 energy service companies (ESCOs) (with a \$5 billion contract ceiling for each ESCO) that are fully qualified to do this work; a comprehensive set of contractual templates and documents, along with a streamlined process that allows agencies to move through a project efficiently in about 12 months; three Federal Financing Specialists assigned to different regions of the country who can assist and educate Federal agencies and build interest in performance based contracts; a team of Project Facilitators and National Laboratory experts who serve as the technical resource and assist Federal agencies as they move through project phases. Additional FEMP support includes on-line training, website resources, classroom training and other outreach activities to raise awareness across the Federal government.**

**FEMP also launched some new initiatives to assist agencies meet this goal. They include promoting "deep" energy retrofit projects (a whole-building analysis and construction process that uses integrated design to achieve much larger energy savings than conventional energy retrofits), a new small site initiative (ESPC ENABLE) for the purpose of bringing in small sites that are currently not being served by the DOE IDIQ**

ESPCs; partnering with Army on their Net Zero initiative that is expected to result in large, comprehensive projects. DOE headquarters is playing a lead role by piloting a data center ESPC with a goal of replicating similar initiatives throughout the Federal government. FEMP is also working with CEQ and OMB on agency sustainability planning and provided a project management tool to assist agencies with planning, tracking and monitoring implementation efforts .

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

### **Electricity**

**Q48:** With its budget request, the Administration proposes \$20 million to establish a new Electricity Systems Hub that will focus on the “seam” between the transmission and distribution systems. Please elaborate on this proposal. Will FERC or NERC be invited to participate? What about electricity stakeholders? In last year’s budget proposal, the Administration sought to create a Smart Grid Hub which I don’t believe was ever established. Does DOE intend to include smart grid activities, including cyber security, within this new Electricity Systems Hub?

**A48:** The Electricity Systems Hub will develop principles and functionalities around the substation of the future, redefining the critical seam between transmission and distribution. Innovation at this interface is necessary to enable the effective use of clean generation, electrification, and smart grid technologies. The Hub will convene diverse stakeholders including FERC, NERC, utilities, industry, system operators, regulators, commissioners, consumer advocates, national labs, and academia to solve the technical and institutional challenges at this interface. Hub activities will build upon existing smart grid projects, innovate, and embed a culture of cyber-physical security.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q49:** The FY 2013 budget request proposes \$143 million for the Office of Electricity Delivery and Energy Reliability, a 3% increase over the FY 2012 enacted level. DOE's budget materials note that "[t]hese efforts build upon the Recovery Act investments that will have successfully deployed more than 26 million smart meters and 1,000 phasor measurement units in FY 2013, laying the foundation for a modernized electricity grid." However, a January 2012 DOE Inspector General Report on the Department's management of the Smart Grid Investment Grant Program found that many of the grant recipients failed to include adequate cyber security measures. What steps is the Department taking to address these inadequacies?

**A49:** DOE takes very seriously the responsibility of managing and overseeing the Smart Grid Investment Grant (SGIG) Program to protect taxpayer funds and ensure that projects are moving forward effectively to modernize our Nation's electricity grid. The security of our electrical grid is of the utmost importance, which is why the Department developed a comprehensive cybersecurity approach for all of SGIG projects. DOE required all recipients to develop cybersecurity plans that provided information about how they would identify cybersecurity risk, how those risks would be mitigated, and how the processes in place would ensure that a sufficient cybersecurity posture be maintained. Those cybersecurity plans were subject to a rigorous review by DOE cybersecurity experts, including iterations between DOE's cybersecurity and the recipient's cybersecurity experts prior to final approval. DOE approved cybersecurity plans for all 99 SGIG projects. DOE did not approve any SGIG cybersecurity plan that failed to meet DOE requirements.

The IG's opinion about what should have been included in the required cybersecurity plans differs from what DOE believes is necessary. The cybersecurity plans described a process that, when implemented correctly, would establish and maintain an adequate



cybersecurity profile and, at the same time, retain flexibility so that specific cybersecurity protections could be addressed as the project requirements became better defined from the design phase to the deployment phase.

DOE will continue to ensure that the cybersecurity plans of the SGIG recipients are complete and are being implemented properly. The Department has conducted a progress review of the recipients' cybersecurity implementations as an integral part of numerous site visits conducted over the past year. The interim assessments performed by cybersecurity experts during site visits help ensure that the recipients are implementing the cybersecurity actions and approaches outlined in their plans. DOE is in the process of reviewing information gathered from the on-site project reviews and, based on this review, will determine whether recipients are required to update their plans.

DOE will continue conducting on-site visits, sharing best practices, offering information-sharing sessions via workshops and webinars, and evaluating recipients' progress against their required cybersecurity plans.

### **QUESTION FROM SENATOR JOHNSON**

**Q1:** I appreciate the Department's intent to continue to support activities for minimal, sustaining operations at the Homestake mine in South Dakota. As you know, over the past year, operations have been moving forward through a combination of state, private, and federal resources. The project team has been updating the shafts to ensure they are safe and continuing to pump water from the mine and is supporting several early science experiments. Unfortunately, though, it is my understanding that the Department's request would reduce funds for "minimal, sustaining operations" by approximately a third below the FY 2012 level. This would very likely result in several operational changes, including layoffs of dozens of employees in the small town of Lead, SD. Additionally, this reduction would not instill confidence in our longstanding state, international, and private partners that have dedicated significant funding to this project. How does the Department plan to sustain this critical facility, continue to attract international interest, and keep dedicated private and state partners together given the current budget request?

**A1:** The Department is exploring the impacts of the FY 2013 budget for "minimal, sustaining operations" at Homestake with the staff responsible for these operations to ensure continued operations at the mine to support the current science program. Sustaining these operations will require continuing communication with and involvement of private and state partners. Other scientific activities that could utilize sites like the Homestake mine are in planning or pre-planning stages. Once the plans for these experiments are determined, it will be possible to engage in discussions with possible partners about

## **QUESTION FROM SENATOR JOHNSON**

**Q2:** I am pleased that the Administration seeks a 2.4 percent increase for the Office of Science. Additionally, I am pleased that the Administration is placing a heavy emphasis on the development of renewable energy. At the same time, I am also concerned about the proposed reductions to the Offices of High Energy Physics and Nuclear Physics. These offices have provided funding for operations of the Homestake Mine in South Dakota and the design of the Long-Baseline Neutrino Experiment, which has been recommended by the National Academies and numerous interagency committees. These scientific fields have become global in nature, but currently the U.S. role is participatory. As such, what are the Administration's plans to ensure the U.S. regains its leadership role in particle physics and to take advantage of unique assets like the Sanford Underground Research Facility in Lead, SD?

**A2:** DOE is committed to maintaining U.S. leadership on the Intensity Frontier of particle physics. A suite of neutrino experiments is either already underway or under construction as part of the Department's intensity frontier program. A major workshop was held in December 2011 to help develop plans for this program. The program will involve the production of intense particle beams using the Fermilab accelerator complex and a series of experiments to explore neutrino interactions, rare decays, and other precision measurements of forefront interest to the international particle physics community. The unique facilities at Fermilab enable the U.S. to hold this leadership role on the Intensity Frontier. In addition, deep underground sites like the one at Homestake could house facilities for U.S. based dark matter direct detection and double beta decay experiments. Currently, Homestake hosts demonstration experiments in these areas.

## **QUESTION FROM SENATOR BARRASSO**

**Q1. The Department's 2008 Excess Uranium Inventory Management Plan states that the Department will not dispose of more than 3.8 million pounds of natural uranium equivalent during calendar year 2012. Will the Department abide by its own Management Plan to ensure that no more than 3.8 million pounds of excess uranium inventories enter the commercial market? If not, why not and how much uranium will enter the market?**

**A1. On May 15, 2012, the Secretary of Energy issued a determination that specifically considered the following potential transfers:**

- 1. Up to 9,082 metric tons uranium (MTU) of DUF<sub>6</sub> to Energy Northwest (ENW) in CYs 2012 and 2013, which would be immediately followed by enrichment to LEU equivalent to 482 MTU, with ENW utilizing a portion of the LEU for fueling the nuclear power reactor it operates. The remaining LEU would be sold as LEU or, in its component parts, as NU and separative work units (SWU) to the Tennessee Valley Authority (TVA) as part of a commercial transaction to support future power generation and tritium production from 2013 through 2030, thereby serving national security purposes.**
- 2. Up to 2,400 MTU per year of NU to DOE contractors as compensation for cleanup services at the GDP sites at Paducah, Kentucky, or Portsmouth, Ohio, in quarterly transfers of up to 600 MTU for the period 2012 through 2021.**
- 3. Up to 400 MTU NU equivalent per year contained in LEU transferred to NNSA contractors for down-blending HEU to LEU for the period 2012 through 2020.**

**The Department's uranium transfers in 2012 are proceeding consistent with the May 2012 Determination.**

### **QUESTION FROM SENATOR BARRASSO**

- Q2.** On January 13, 2012, the Department announced that it will assume \$44 million in liability for depleted uranium from USEC. I am concerned about the impact that this decision will have on the commercial market for uranium and on jobs within the uranium mining industry. Will the transfer of liability result in any excess uranium inventories entering the commercial market beyond the amount specified in your answer to question one? If so, how much additional uranium will enter the market?
- A2.** The Department signed a contract to procure approximately \$44 million of separative work units (SWU) of enrichment services from USEC, and will compensate USEC for the SWU by accepting title to and disposal responsibility for a portion of USEC's depleted uranium tails that present liabilities valued at approximately \$44 million. The Department has taken title to, and eventual disposal responsibility for, the depleted uranium tails, and has provided natural uranium as feedstock to USEC in return for receiving low enriched uranium (LEU) in a quantity that is equal to the natural uranium feed provided and then enriched with the value of SWU the government is procuring. The LEU resulting from this procurement is now owned by DOE and held in its inventory. The LEU can be used to support tritium production. This transaction with USEC did not result in uranium entering the market.

### **QUESTION FROM SENATOR BARRASSO**

- Q3.** Will the Department take any other actions involving or related to USEC which will result in any excess uranium inventories entering the commercial market beyond the amount specified in your answer to question one? If so, what are those actions and how much additional uranium will enter the market?
- A3.** At the time of this hearing, the Department does not anticipate taking any actions involving or related to USEC which will result in any excess uranium inventories entering the commercial market beyond the amount specified in the answer to question 1.

#### **QUESTION FROM SENATOR BARRASSO**

- Q4.** It is my understanding that the Department is currently revising its 2008 Excess Uranium Inventory Management Plan. What steps are you taking to ensure that the revised plan will promote a strong and stable uranium mining industry within the United States?
- A4.** The principles underlying the 2008 Excess Uranium Inventory Management Plan (Plan) are that the Department manages its inventory of excess uranium in a manner that is consistent with current law, maintains an adequate inventory for DOE mission needs, ensures transactions with non-Government entities are transparent and competitive, and supports the maintenance of a strong domestic industry. The Department remains committed to the maintenance of a strong domestic uranium industry, and the revised Plan will reflect adherence to policies and legal requirements that protect the interests of the domestic uranium industry in an effective and reasonable manner while providing the Department with the necessary flexibility to meet its programmatic needs and responsibilities.



### **QUESTION FROM SENATOR BARRASSO**

- Q5.** Can you tell me whether the revised plan's annual limits on the Department's excess uranium inventory dispositions will be no more than 5 million pounds or 10 percent of annual domestic fuel requirements?
- A5.** The May 2012 Determination described in answer to question 1 effectively sets the Department's agenda for uranium transfers for the time span of the Excess Uranium Inventory Management Plan currently undergoing revision while keeping in mind the principles set out in the answer to question 4.

### **QUESTION FROM SENATOR BARRASSO**

- Q6. The Department's FY 2013 budget request states that the Department "will begin implementing a disposition plan developed in FY 2012" for the Rocky Mountain Oilfield Testing Center and NPR-3. Has the Department completed its disposition plan for the property? If not, when will the Department complete the disposition plan?**
- A6. The plan analyzing the options for disposing of Naval Petroleum Reserve No. 3 and the Rocky Mountain Oilfield Testing Center (RMOTC) is currently being prepared. It is expected that the disposition plan will be completed by the end of the year.**

### **QUESTION FROM SENATOR BARRASSO**

- Q7.** It is my understanding that in 2009 the Department selected a number of projects to proceed to detailed due diligence and negotiation of terms and conditions necessary for a section 1703 loan guarantee. When do you anticipate that the Department will complete the review process for these projects?
- A7.** The Department seeks additional guidance and clarification on the “selected . . . number of projects” from 2009 that is cited and in order to answer the question responsively.

### **QUESTION FROM SENATOR BARRASSO**

**Q8.** It is my understanding that the Department of Energy, the Department of Treasury, and the Office of Management and Budget all participate in the review process of projects considered for section 1703 loan guarantees. Do any other agencies or offices within the Administration participate in the review process? If so, which agencies or offices?

**A8.** Treasury and OMB are the only agencies or offices that have a statutory role in the review process for Section 1703 loan guarantees.

The statutory basis for Treasury's consultative role is found in Section 1702 (a) of Title XVII of the EPAct of 2005, which authorizes the Secretary of Energy "to make guarantees . . . for projects on such terms and conditions as the Secretary determines, after consultation with the Secretary of the Treasury." (Sec. 1702(a)).

OMB's authority is derived from Section 503 of the Federal Credit Reform Act (FCRA), which provides: "For the Executive Branch, the Director [of OMB] shall be responsible for coordinating the estimates required by this title." ["Under this authority, the director of OMB delegates the authority to agencies to make estimates, while OMB reviews and must approve credit subsidy costs for all programs."] The Final Rule governing Section 1703 provides that OMB must review and approve DOE's calculation of the credit subsidy cost prior to issuance of a loan guarantee.

### **QUESTION FROM SENATOR BARRASSO**

- Q9.** Will you provide the Committee with a list of the projects currently under review for a section 1703 loan guarantee? Please also explain the current status of each project and the remaining steps that need to be taken to complete the review process for each project.
- A9.** Disclosure of the status of loan guarantee applications may involve proprietary information that could adversely affect a company's financial position. Accordingly, we shall seek to accommodate the request for details about specific transactions through other means.

## **QUESTION FROM SENATOR WYDEN**

### **Water Power budget cuts**

**Q1.** For the third year in a row, DOE's budget cuts funding for water power technologies, like wave energy. The Europeans are committing hundreds of millions of dollars to wave energy technology, yet water power technologies were cut 66% to \$20 million. The U.S. does not even have a test bed for full-scale wave energy devices, as the Europeans do, because you keep cutting the budget. Water power technologies have broad, bi-partisan support here in the Congress (as shown when this Committee adopted both of Sen. Murkowski's marine energy and hydroelectric bills last year) and at home. Cities want to install small hydro projects in their water systems. Irrigation districts want to install them in their irrigation canals. Why has the Department cut water power funding?

**A1.** In FY 2012, the DOE Water Power program will continue and complete a number of important water power technology research and development projects. The FY13 request of \$20 million will allow the Department's Water Power Program to continue its ongoing projects to advance water power technologies and accelerate their market adoption. At this funding level, DOE would be able to support a number of water power technologies for both conventional hydropower and emerging marine and hydrokinetic (MHK) energy technologies.

For hydropower specifically, DOE selected 16 new innovative hydropower technology development projects for funding in FY 2011, and that work will continue into FY 2012 and FY 2013. Additionally, DOE expects to continue its efforts to analytically quantify the benefits that conventional and pumped-storage hydropower provide to the electric grid, which can also support the integration of variable renewable resources like wind and solar. For MHK technologies, in FY 2013 activities are slated to focus on developing a suite of technologies that harness the energy from wave, tidal, and current resources. Specifically, MHK research is expected to focus on maintenance and development of

advanced open water test infrastructure for MHK devices and research into the costs and performance of innovative, early-stage MHK systems and components. Finally, DOE anticipates conducting resource and technology assessments in FY 2012 and FY 2013 to accurately characterize all opportunities for water power development. DOE intends to use data from ongoing techno-economic MHK assessments to establish baseline costs, which DOE will use along with resource assessments to evaluate the need for further innovative water power R&D.

## **QUESTION FROM SENATOR WYDEN**

### **Hydrogen and fuel cells budget cuts**

**Q2.** Hydrogen and fuel cell technology funding was cut more than 22% to \$80 million. Here again is a technology with enormous potential and global competitors. A recent Pike Research white paper estimated the global market for fuel cells at \$785 million for 2012. When this Committee was considering my alternative fuel vehicle bill last year, both of the major auto manufacturers groups recommended the bill place more emphasis on hydrogen, but DOE is recommending exactly the opposite. Why is the Department cutting hydrogen and fuel cell research?

**A2.** The budget request for hydrogen and fuel cells has been reduced as part of rebalancing the Department's portfolio of advanced technologies. However, hydrogen and fuel cells remain an integral part of that portfolio and significant progress is being made. The budget request for fiscal year 2013 allows the Department to focus on hydrogen and fuel cell activities that will continue to yield technology advancements in key areas—including ongoing reductions in the cost and improvement in the durability of fuel cells, reductions in the cost of renewably produced hydrogen, and improvements in systems for storing hydrogen. Funding has been reduced for aspects of the program with less impact on R&D progress, such as technology validation, codes and standards, and market transformation. Rebalancing the portfolio will allow the Department to focus on nearer term transportation technologies while maintaining a strong effort in hydrogen and fuel cells.



## QUESTION FROM SENATOR WYDEN

Q3. DOE also cut funding for grid-connected energy storage by 25% to 15 million in the Office of Electricity Delivery and Reliability. Energy storage technologies have application to a number of DOE programs and program offices—from energy efficiency, to integration of intermittent renewables, to electric grid management. At the hearing, Sen. Wyden requested that Secretary Chu provide the Department’s technology roadmap or strategic plan for Department-wide research and development of energy storage technologies. Please provide this material.

A3. DOE is pursuing a department-wide coordinated R&D strategy for energy storage. This strategy is articulated the following key documents:

- The *Grid Storage Report to Congress* (July 2010) describes the roles of each DOE Office, technical goals, and R&D portfolio overviews.
- The *Energy Storage Program Planning Document* (February 2011)<sup>2</sup> describes grid-scale energy storage technology challenges and needs, as well as near- and long-term DOE objectives in relevant R&D and demonstrations.
- The *Vehicle Technologies Program Multi-Year Program Plan* (2011-2015)<sup>3</sup> describes DOE goals for vehicle energy storage R&D, related technical challenges and barriers, and cross-referenced specific research tasks.

In addition, the *Quadrennial Technology Review* (September 2011)<sup>4</sup> establishes an overarching framework for DOE strategy in energy technologies, including energy storage. As it notes, the deployment of storage technologies faces barriers that include deficient market structures, limited understanding of system value, and limited large-scale demonstrations. Quantifying the benefits of storage under various operating conditions will be a priority so that industry and regulators alike can fully assess the value of deployed storage capacity. The Department will measure, validate, and disseminate performance information for grid-integrated storage technologies, and

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<sup>2</sup> See <http://energy.gov/oe/technology-development/energy-storage> .

<sup>3</sup> See [http://www1.eere.energy.gov/vehiclesandfuels/pdfs/program/vt\\_mypp\\_2011-2015.pdf](http://www1.eere.energy.gov/vehiclesandfuels/pdfs/program/vt_mypp_2011-2015.pdf) .

<sup>4</sup> See <http://energy.gov/quadrennial-technology-review> .

develop the analytic tools necessary to assess and predict value and service as a function of operation and location.

A key part of DOE's strategy in energy storage is the Batteries and Energy Storage Hub. The interdisciplinary research and development in the Hub is designed to advance next-generation electrochemical energy storage technologies to improve the reliability and the efficiency of the electrical grid, to better integrate clean, renewable energy technologies as part of the electrical system, and for use in electric and hybrid vehicles. The Hub will also serve as an interaction, information, and communication nucleus for the basic and applied battery and energy storage communities—encouraging the flow of people and information to ensure that the problems and issues being faced in today's technologies are understood and to ensure that Hub research will spur innovation and problem-solving broadly. The Hub is currently under review, and an award is anticipated later this year.

## **QUESTION FROM SENATOR WYDEN**

### **Hydraulic fracturing and other drilling technologies**

- Q4.** Your budget has a \$2 million increase in Fossil Energy for interagency research on hydraulic fracturing for natural gas. Those are the right ideas, both to increase funding on hydraulic fracturing and working with other agencies, but my sense is that the development of safer, more predictable hydraulic fracturing technologies is a bigger problem than a few million dollars can solve. Please describe the scope of work and roles and responsibilities and budget of each agency working on this interagency effort.
- A4.** On April 13, 2012 DOE, the Environmental Protection Agency, and the Department of the Interior's U.S. Geological Survey signed a Memorandum of Agreement formalizing this Multi-Agency Collaboration on Unconventional Oil and Gas Research. Through this collaboration, a robust Federal R&D plan is being developed, taking into account the recommendations of the Secretary of Energy Advisory Board (SEAB) Natural Gas Subcommittee. DOE's role in this initiative will focus on priorities identified by the interagency collaboration in a research plan to be formed over the next nine months within its area of core research competencies, including wellbore integrity, flow and control; green technologies; and systems engineering, imaging and materials.
- The three agencies request to support this work with \$45 million; of this amount, DOE is requesting \$12 million.

## **QUESTION FROM SENATOR WYDEN**

**Q5. There are other energy-related technologies, like geothermal energy development, and carbon sequestration, that could benefit from advances in hydraulic fracturing technology and which have similar problems including seismic disturbance from hydraulic fracturing. To what extent are the Department's natural gas drilling and hydraulic fracturing research programs coordinated with the geothermal and sequestration programs?**

**A5. These DOE programs are coordinated through various types of formal and informal technical exchanges including workshops, in-house technical meetings, and one-on-one discussions. Organizationally, the Office of Fossil Energy includes both the oil and gas program and the carbon storage program. These programs are coordinating efforts through periodic meetings to share and exchange program-related information.**

**There has been long-standing interaction between the oil/gas and geothermal programs.**

**This includes the participation of Fossil Energy personnel in the review of project proposals for the DOE Geothermal Technologies Program and in the Interagency Geothermal Working Group led by the National Academies. Further, through a collaborative effort with the DOE Geothermal Technologies Program, the DOE Office of Fossil Energy's Rocky Mountain Oilfield Testing Center demonstrated a geothermal power generation unit using fluids from oil field wastewater streams.**

## **QUESTION FROM SENATOR WYDEN**

### **Advanced Nuclear Fuel Cycle R&D**

**Q6.** The Blue Ribbon Commission on America's Nuclear Future recently recommended that the Nation continue to pursue research, development and demonstration on a range of reactor and fuel cycle technologies. As the Commission noted, potential alternative fuel cycles must account for all elements of the fuel cycle including waste, safety, security, and non-proliferation concerns. There are advanced electro-processing technologies, especially uranium dioxide electrolysis, which appear to have significant benefits over more conventional reprocessing technologies. Please describe the technical viability, proliferation value, security, waste treatment, safety, and reactor design advantages and disadvantages of uranium dioxide electrolysis and other electro-processing technologies and the extent to which the Department is supporting research into these technologies.

**A6.** The Fuel Cycle Research and Development (FCR&D) Program in the DOE Office of Nuclear Energy is researching sustainable nuclear fuel cycle technologies that improve resource utilization, reduce waste generation, enhance safety and limit proliferation risk. Electrochemical processing, also called pyroprocessing, is one of the technologies being researched by the FCR&D program.

Unlike conventional aqueous reprocessing technologies, pyroprocessing operates at elevated temperatures using molten salts as solvents. The use of molten salts in pyroprocessing may provide advantages over aqueous systems. Molten salts are not affected by temperature or radiation damage, so relatively short-cooled fuel can be processed. The technology can handle large quantities of fissile material needed for fast reactors, since a hydrogenous moderator is not present. The technologies are also potentially more compact. However, this technology is not sufficiently mature for commercial deployment and further research is required to fully develop its technical capabilities and better understand its costs, risks, and potential benefits. Specifically, the technologies for the recovery and accountability of transuranic elements (for either

recycling or for material/waste management purposes) must be improved. Also, because this is a batch process, engineering studies would be needed (in conjunction with the resolution of the technology challenges) in order to evaluate the ability to “scale-up” this process and the associated economic feasibility.

Research activities supported by the FCR&D program have focused on understanding the fundamental principles that govern the efficiency of several separations processes, showing technical viability at laboratory scale where appropriate, evaluating waste management needs, and developing an understanding of the non-proliferation features of the processes. Questions about proliferation risks, environmental concerns, economics, technology, and other issues still exist. Current research efforts are focused on understanding the science and reducing the uncertainties.

## **QUESTION FROM SENATOR WYDEN**

### **Manufacturing and Materials Research**

- Q7.** The Department's FY2013 budget includes several initiatives to expand research and development of manufacturing and advanced materials. For example, the Industrial Technology Program within the Office of Energy Efficiency and Renewable Energy is being reorganized as the Advanced Manufacturing Office. The National Energy Technology Laboratory (NETL), including its facility in Albany, Oregon, has unique expertise in materials and manufacturing technology although it has historically supported the Office of Fossil Energy. To what extent, will the Department take advantage of the expertise of the Albany lab and other elements of NETL in its expanded manufacturing and materials research efforts?
- A7.** The Advanced Manufacturing Office (AMO) has pending funding opportunity announcements that will seek to leverage existing manufacturing research and development resources including workforce, infrastructure and capabilities in areas all across the country to help advance important initiatives. The National Energy Technology Laboratory (NETL) facility in Albany, Oregon is an example of the type of facility that could potentially offer these resources. AMO encourages NETL to apply when these competitive, merit-reviewed solicitations are issued.

## **QUESTION FROM SENATOR CANTWELL**

### **Funding for the Hanford Waste Treatment Plant**

Mr. Secretary, while I am pleased to see DOE's continued commitment to cleaning up nuclear wastes on the Hanford Reservation, I have a few significant concerns. The Waste Treatment Plant is currently undergoing a re-baselining effort and DOE's FY 13 budget request for the Waste Treatment Plant is down \$50 million from last year – about \$110 million below the average costs of the past 3 years.

**Q1. Can you reassure my constituents in the Tri-Cities that this budget request and re-baselining effort will keep the Waste Treatment Plant on schedule to be completed and operational by 2019?**

**A1. The Department is committed to working with the Congress, the Defense Nuclear Facilities Safety Board, and other key stakeholders to deliver a safe and efficient Waste Treatment Plant that addresses the major environmental risk at Hanford as close to the current cost and schedule baseline as possible.**

**At the requested funding level of \$690M, the project will prioritize its FY2013 efforts on: 1) resolution of remaining technical issues, including the Defense Nuclear Facilities Safety Board Recommendation 2010-2 Implementation Plan commitments for Pulse Jet Mixing performance demonstration; 2) completion of the Low-Activity Waste Facility (LAW), Balance of Facilities (BOF), and the Analytical Lab; and 3) focus remaining resources first on the High-Level Waste Facility (HLW), and then on the Pretreatment Facility (PT).**

**Until the Department develops its independent cost estimate, the rebaselining proposal is received from the contractor, and the independent reviews are concluded, cost and schedule implications cannot be defined.**



**QUESTION FROM SENATOR CANTWELL**

- Q2. Is there any risk that Hanford clean-up funding at the President's FY13 budget request will prevent DOE from meeting the milestones of the Tri-Party Agreement?**
- A2. The President's FY13 budget request positions DOE to meet all FY13 Tri-Party Agreement milestones.**

### **QUESTION FROM SENATOR CANTWELL**

**Q3. Is there any risk that Hanford clean-up funding at the President's FY13 budget request will increase the likelihood that radioactive materials will contaminate the Columbia River?**

**A3. The Department has made significant progress in removing hazards from the Columbia River corridor. The risk posed by radioactive material contamination of the Columbia River in the short-term is extremely low based on groundwater modeling done in support of the Tank Closure and Waste Management Environmental Impact Statement. At the Tank Farms, all pumpable liquids have been transferred from the older single-shell tanks to the newer and more durable double-shell tanks. Barriers have been placed over some tank farms to reduce the risk of further contamination. The FY13 President's Budget request provides the resources to continue retrieval of the tougher sludge and saltcakes in single-shell tanks and transfer it to the double-shell tanks. No double shell tanks are believed to have ever leaked, and no single-shell tanks are currently leaking. The Department remains fully committed to completing this important mission of removing the threat posed by Hanford's tank waste.**

## **QUESTION FROM SENATOR CANTWELL**

I'm also concerned about some recent reports, including concerns raised by whistleblowers, about the design of the Waste Treatment Plant. I understand this is a challenging project and that some of the Hanford waste treatment facilities and technologies are one-of-a-kind, but the plant must have the ability to operate reliably for decades once it comes online. When the waste treatment plant begins processing waste, high levels of radioactivity inside the facility will prohibit humans from entering it to make repairs. While we all want the plant to be completed in a timely and cost-efficient manner, we simply cannot allow any margin for error.

**Q4.** How exactly is the Department of Energy providing oversight to guarantee that the Waste Treatment Plant will be able to accomplish its unique mission, and have you looked into the design issues?

**A4.** The Waste Treatment Plant (WTP) is the chosen method by which the majority of the tank waste will be stabilized for long-term disposal. As such, the Department, its regulators and contractors work closely together to ensure the plant is capable of safe and efficient operations. In this relationship, the Department oversees and is ultimately responsible for all aspects of the WTP nuclear safety, design, verification and validation, and construction and commissioning. Given the importance, scope and visibility of this project at Hanford, the Department routinely engages experts from government, industry and academia to provide additional independent reviews and assessments of the WTP project. The Department will continue to work closely with its contractors, stakeholders, technical oversight, regulators, Congress and others to ensure that the WTP will safely achieve its tank waste treatment mission at Hanford.

## **QUESTION FROM SENATOR CANTWELL**

### **Waste Isolation Pilot Plant (WIPP) and Nuclear Defense Waste from Hanford**

Mr. Secretary, waste retrieval and reversibility have historically been major limiting factors in the siting and cost of proposed waste disposal facilities. Yet the high level waste at the Hanford site is scheduled to be vitrified in the Waste Treatment Plant beginning in 2019, a process that will render materials in high level waste both stable and unrecoverable for future commercial or nuclear purposes. A permanent storage site will then be necessary for these vitrified wastes. Allowing Hanford to become the de facto repository for these wastes—which represent 90 percent of the nation's high-level radioactive defense waste—is unacceptable to me and my constituents.

**Q5:** How do you propose that we resolve the long-term storage problem and move to establish a permanent repository for treated military wastes?

**A5:** The Department's inventory of high-level waste and spent nuclear fuel resulting from historic defense-related operations is currently safely managed at four sites within the complex. The high-level waste and spent nuclear fuel can be safely stored on site for several decades pending the availability of a geologic disposal facility.

To ensure that nuclear power continues to be a safe, reliable resource for our nation's long-term energy supply and security, the United States must put in place a sustainable fuel cycle and used fuel management strategy. To advise the Administration, Secretary Chu convened the Blue Ribbon Commission on America's Nuclear Future (BRC). This expert panel completed their final report and recommendations in January of 2012. The Administration is giving full consideration to the BRC recommendations as we work to define a path forward. The Administration anticipates providing additional information later this year, and will work with Congress to implement a new strategy to manage our nation's used nuclear fuel and nuclear waste.

### **QUESTION FROM SENATOR CANTWELL**

At a hearing two weeks ago, former Energy Committee Chairman Domenici suggested that military waste should be prioritized and that the Waste Isolation Pilot Plant (WIPP) in New Mexico might be ideally situated for Hanford's waste.

**Q6:** Do you agree that WIPP is well-suited to accommodate the waste at Hanford?

**A6:** The Department is currently evaluating the recommendations of the Blue Ribbon

Commission regarding long-term waste disposal. The Department's experiences at WIPP will be considered as part of that assessment.

### **QUESTION FROM SENATOR CANTWELL**

- Q7:** What advantages and disadvantages do you see in using WIPP to dispose of Hanford waste in terms of cost, safety, and timing?
- A7:** The Department is currently evaluating the Blue Ribbon Commission recommendations for disposal of high-level waste and spent nuclear fuel. At this stage it is premature to assess the impact on cost, safety, and timing.

### **QUESTION FROM SENATOR CANTWELL**

**Q8:** Do you see any technical barrier to disposal of additional volumes of vitrified high-level waste, spent nuclear fuel, and other wastes from Hanford at the WIPP facility? Could the facility potentially accommodate higher levels of both contact-handled and remote-handled wastes?

**A8:** At present, WIPP's mission is limited by statute to the disposal of defense transuranic waste. Therefore, WIPP's design and regulatory approvals currently support only transuranic waste disposal. Additional evaluation is necessary to determine whether any technical barriers exist to disposal of high-level waste and spent nuclear fuel at WIPP. Based on early studies and ongoing international efforts, disposal of these wastes in a salt repository appears to be technically feasible.

The WIPP Land Withdrawal Act of 1992, as amended, limits the repository disposal volume to 175,675 m<sup>3</sup> of defense-related transuranic waste. In addition, WIPP is limited to a total curie level for remote-handled transuranic waste which is not to exceed 5.1 million curies and a volume requirement not to exceed 7,080 m<sup>3</sup>.

There are no technical barriers to WIPP accepting additional volumes of contact-handled and remote-handled transuranic wastes.

### **QUESTION FROM SENATOR CANTWELL**

**Q10:** Under the Land Withdrawal Act, does the Department of Energy have the authority to transfer larger quantities of defense wastes, including spent nuclear fuel and vitrified high level wastes, from Hanford to WIPP within the current limits of WIPP's license? If not, what authority would be necessary?

**A10:** Under the Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act of 1992, as amended,

DOE does not have the authority to dispose of spent nuclear fuel or high level radioactive

### **QUESTION FROM SENATOR CANTWELL**

**Q9: Considering that WIPP has now been operated successfully for over a decade now, what barriers prevent the facility from being expanded beyond its current maximum of 175,500 cubic meters of defense-generated transuranic (TRU) waste.**

**A9: The Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act of 1992 (WIPP Land Withdrawal Act), as amended, limits the repository disposal volume to 175,675m<sup>3</sup> of defense-related transuranic (TRU) waste. The WIPP Land Withdrawal Act and the Environmental Protection Agency certification impose a limit on total curie level for remote-handled TRU of 5.1 million curies. Additionally, the Consultation and Cooperation Agreement with New Mexico limits the total volume of remote-handled TRU to 7,080 cubic meters. While there are no apparent technical barriers to WIPP being expanded to receive additional TRU waste volumes beyond the statutory limit, there are significant legal barriers.**

**With respect to additional TRU waste, it would be necessary to revise the statutory limits in the WIPP Land Withdrawal Act and the Consultation and Cooperation Agreement with New Mexico, and to obtain the appropriate regulatory approvals from EPA and the State of New Mexico.**



## **QUESTIONFROM SENATOR CANTWELL**

**Q10: Under the Land Withdrawal Act, does the Department of Energy have the authority to transfer larger quantities of defense wastes, including spent nuclear fuel and vitrified high level wastes, from Hanford to WIPP within the current limits of WIPP's license? If not, what authority would be necessary?**

**A10: Under the Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act of 1992, as amended, DOE does not have the authority to dispose of spent nuclear fuel or high-level radioactive waste at WIPP. Section 12 of the Act specifically states, "The Secretary shall not transport high-level radioactive waste or spent nuclear fuel to WIPP or emplace or dispose of such waste or fuel at WIPP."**

## **QUESTION FROM SENATOR CANTWELL**

### **Pending Land Transfer at Hanford Site**

Mr. Secretary, DOE completed its Comprehensive Land Use Plan (CLUP) in 1999 that identified nearly 10% of the Hanford Site that could be used for industrial development in the future. The remaining 90% of the Hanford Site was identified for preservation or conservation. That CLUP met all requirements under the National Environmental Policy Act (NEPA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) at the time, and a Record of Decision was made following the release of the final CLUP.

Q11. To what extent can the current process and review rely on existing data, particularly from the CLUP, to expedite finding new productive uses for Hanford land?

A11. DOE is taking steps required prior to any potential transfer including review under NEPA.

DOE will complete an Environmental Assessment (EA) for any proposed land transfer action and will engage interested members of the public in the NEPA process. Any land transfer EA will review/consider existing documents and studies that are pertinent to the land transfer action, including the CLUP, which was updated in a supplement analysis in 2008.

### **QUESTION FROM SENATOR CANTWELL**

**Q12. Knowing that the CLUP had extensive public involvement in support of industrial development, why doesn't this satisfy certain NEPA/CERCLA requirements? What is the NEPA/CERCLA legal structure governing this current review and process, and the requirements for any public comment?**

**A12. The CLUP provides broad NEPA coverage for land-use designations such as "industrial" but does not satisfy NEPA requirements for site-specific activities, such as the transfer of Federal lands. DOE recognizes that in accordance with NEPA, public input is an important component of its evaluation, and that input received from the CLUP will be considered in the preparation of the EA.**

**The CERCLA process to ensure that cleanup activities are sufficient to meet the anticipated land use has not been completed for the lands being considered for transfer. Upon completion of the work required to meet CERCLA remedy requirements, DOE will request Environmental Protection Agency concurrence on a Clean Parcel Determination pursuant to section 120(h)(4) of CERCLA.**

### **QUESTION FROM SENATOR CANTWELL**

- Q13. What are the baseline studies that DOE envisions that will take 18 or more months to complete before the 1,641 acres requested are transferred to the Tri-Cities community? How can this process be streamlined and expedited?**
- A13. As part of the NEPA process to prepare the Environmental Assessment (EA), DOE will need to conduct cultural and natural resource surveys for portions of the lands where such surveys have not been completed to date. In addition, DOE will take advantage of existing surveys where they are available and will complete necessary further data- gathering activities as efficiently as possible. We hope to arrive at a consensus as to reasonable alternatives and the scoping process for the EA involving the public and interested stakeholders.**

## **QUESTION FROM SENATOR CANTWELL**

### **U.S. Fossil Fuel Exports**

Mr. Secretary, I was troubled by your recent comments in Houston which seemed to suggest that you may have pre-determined that exporting natural gas was in the public interest, or that it was okay if natural gas exports led to moderately higher natural gas prices for American consumers and businesses.

Q14. Do you think that fossil fuel prices would increase domestically as a result of expanding our exports of fossil fuels? If so, how do you weigh the likely impact of those price increases on the economy? Please provide individual responses to these questions for oil and petroleum exports, natural gas exports, and coal exports taking into account the different market dynamics for each fuel.

A14. DOE has not conclusively studied the domestic price impact on fossil fuels as a result of an increased export of fossil fuels.

Oil and Petroleum Exports: Crude oil from the United States (U.S.) cannot be exported without a special clearance from Congress, and as a result, crude oil is rarely exported – the one exception being some crude oil exports from Alaska in the 1990's when the U.S. West Coast had excess supplies of oil. Refined oil products can be exported however. In theory, assuming both crude or refined products could be exported, it appears that increasing exports of U.S. oil (if U.S. production remained the same) might have little, or no, effect on oil prices since these prices are determined in international markets. Thus, if U.S. exports increased the U.S. would have to increase imports to balance out its domestic needs – i.e., basically this would appear to be a net balancing of oil supplies with no price effects.

However, if the U.S. increased domestic oil production, either for export or domestic use, this might, depending on the size of the increase relative to the size of the global market, put downwards pressure on international oil prices because it would increase the overall supply of oil in international markets.

Natural gas: In January 2012, the Energy Information Administration (EIA) released a study that found domestic natural gas prices could increase as a result of domestic natural gas exports, in addition to a number of other findings. This report is available on the EIA website at: <http://www.eia.gov/analysis/requests/lc/>

Coal: The U.S. has traditionally been a net exporter of coal. The EIA shows the U.S. currently exports about 5% of the approximately 1.1 billion tons of coal it now produces annually. Thus, the effects, if any, of these levels of exports have already been factored into the prices paid for coal in the U.S. The effects of increasing coal exports beyond these levels would depend on how readily, and at what price, the U.S. coal could increase its production.

### **QUESTION FROM SENATOR CANTWELL**

**Q15. Does it make sense for the United States to export more raw energy commodities—and the resulting environmental impacts—across the Pacific just to have finished goods such as solar panels be imported back to the U.S.?**

**A15. In general, free international trade of goods and services could benefit all parties with each party exporting the products it can produce most efficiently, and importing the products it cannot produce as efficiently as others.**

### **QUESTION FROM SENATOR CANTWELL**

**Q16. Do you think exporting natural gas and coal would make them behave more like oil--a world market commodity, governed by higher, more volatile day-to-day prices?**

**A16. It is more likely that exporting natural gas or coal into international markets would not cause them to act like international oil markets. International oil markets are fully integrated and buy and sell oil in an international market where virtually all transactions are valued according to the dynamics of that international market with price adjustments for quality and location. The international markets for natural gas and coal, to the extent that these markets exist, are much more regional and local in operation. Thus, these markets do not set an international price for natural gas or coal. The prices and transactions that do take place in these markets are much more likely to reflect local or regional market conditions and often are point-to-point transactions with long term contracts. These contracts tend to reduce price volatility.**



## **QUESTION FROM SENATOR CANTWELL**

### **Relationship between Gasoline Prices to Supply and Demand Fundamentals**

Mr. Secretary, there are few economic drivers more significant than prices at the pump. Even small gas price increases can significantly impact every family budget and the bottom lines of virtually every American business. Higher gas prices hurt consumer confidence and can also be a serious threat to economic recovery. Many industry analysts think we are just a few months away from \$4 per gallon of gas, which tends to be the point at which the price of gas starts to undermine economic growth. And we'll shoot right past that if Iran reacts to additional economic sanctions by restricting its production or even attempting to close the Strait of Hormuz.

While these geopolitical considerations have an understandable impact on prices at the pump, every year the oil markets seem to be getting further and further divorced from the laws of supply and demand. During a Finance Committee hearing last year, I asked Exxon-Mobil CEO Rex Tillerson what he thought the price of oil should be if it were based on supply and demand fundamentals. His answer was \$60 to \$70 a barrel, rather than the \$100 - \$115 we see today. I've studied this issue closely for many years now, and I think the evidence is clear that excessive speculation in the oil futures market drives disruptive behavior in the price of oil.

**Q17. What do you think is responsible for our new era of volatile and elevated oil and gasoline prices?**

**A17. Volatility in the oil market and periodic high gasoline prices have been concerns during the last four decades. Continuing unrest in many oil-supplying nations of the Middle East and North Africa has contributed to price volatility in the oil market by adding uncertainty about the availability of supply. Additionally, the global demand for oil has increased, particularly with the rapid industrial growth and development in countries like China, India and Brazil. For instance, in 2010 alone, China added roughly 13 million cars on its roads. As standards of living rise throughout the world, there will be more demand for oil, and that will affect prices of petroleum and petroleum products worldwide.**

### **QUESTION FROM SENATOR CANTWELL**

**Q18. Do Americans simply have to live with high prices and high volatility until better alternatives allow us to run our cars and trucks on something other than oil, or make them all run on less oil?**

**A18. Without changing their fuel or vehicles, Americans do have options for reducing oil consumption by making choices about vehicle maintenance and operation.**

**FuelEconomy.gov, one of DOE's most heavily trafficked websites, offers its many visitors information on those options. Americans can choose when and how to make trips both locally and long-distance. The Administration has called for transportation policies that offer Americans more choices among available modes of transportation to make those trips. These are some of the options available to Americans who wish to control their energy costs without replacing their existing vehicles or changing fuels.**

### **QUESTION FROM SENATOR CANTWELL**

**Q19. It was just a decade ago that Saudi Arabia was trying to keep world prices in the range of \$22 to \$28 dollars per barrel to discourage the development of alternatives, why isn't \$100 per barrel helping spur alternatives to gasoline?**

**A19. High oil prices have, and will continue to, spur the development of alternatives to gasoline. Higher prices at the pump impact consumer preferences for vehicles with greater fuel economy, helping spur innovation in the design and production of those vehicles. Driven by these innovations and by the Administration's historic new fuel economy standards, the fuel economy of America's light duty vehicle fleet has achieved an all-time high over the last year. U.S. Department of Energy (DOE) programs have also seen an unprecedented response from entrepreneurs and applicants with innovative technologies that could reduce oil consumption. Specifically, these programs have cut the cost and improved the performance of promising electric vehicle, biofuels and fuel-efficient technologies. To achieve full commercialization of alternative fuels, we must continue to invest in innovations that make alternatives competitive with fossil fuels on both price and cost.**

### **QUESTION FROM SENATOR CANTWELL**

**Q20. What is necessary to break oil's monopoly on our transportation system, and what will bring alternative fuels online on a scale to compete with fossil fuels?**

**A20. Developing alternative fuels and advanced vehicles through investments in innovation is essential to diversifying the energy used in the U.S. transportation sector. The recent introduction of more electric vehicles into the light duty fleet is a major step toward that objective. In the long-haul heavy duty truck fleet, greater use of natural gas has the potential to be a complementary approach to addressing the dependence on oil. In addition to pursuing advances in technology and infrastructure for electric and natural gas vehicles, DOE is also investing in the development of biofuels that can be produced at a commercial scale and sold at a cost that is competitive with fossil fuels. The DOE Biomass Program is taking specific steps such as developing fuels that can be directly dropped into existing infrastructure for gasoline, diesel, jet fuel, and a host of other useful products. Sustained investment in these innovation paths is necessary to fully develop and deploy the technology solutions that can address oil dependence in the transportation sector.**

### **QUESTION FROM SENATOR CANTWELL**

The President announced a significant amount of new oil and gas drilling in his State of the Union speech. Yet based on the testimony from experts we have heard in the Energy Committee, drilling or bringing in more oil from Canada is not going to make a bit of difference in the world price of oil, especially in the short run. The same would hold true even if we opened up drilling off every coastline in the United States. The Energy Information Administration states that even the most comprehensive domestic drilling proposals would only decrease gasoline prices by 3 to 5 cents—and not until 2030.

**Q21.** In your opinion, will any amount of additional drilling lead to substantially lower prices at the pump today, tomorrow, or any time in the next 20 years?

**A21.** Oil prices are set on a global market and fluctuate depending on global the market conditions. Even if the United States were a net oil exporter, U.S. gasoline prices would be set based on global oil prices as they are today. Given the complexity and uncertainty of predicting the future global oil market it would be difficult to determine whether additional domestic drilling would substantially lower prices.

## **QUESTION FROM SENATOR CANTWELL**

### **Budget Cuts to Water Power R&D**

Mr. Secretary, as you know hydropower is the largest source of clean, renewable energy in the United States. And Washington State produces almost a third of the nation's total. This affordable, emissions-free, and renewable power source has helped attract new business investments to the Pacific Northwest and there is great potential remaining, as was recognized by the 2011 Hydropower Improvement Act, bipartisan legislation led by Senator Murkowski. A recent study has shown that with the right policies, hydropower could create over 1.4 million cumulative direct, indirect, and induced jobs by 2025. Given this potential, I have some concerns about the FY 2013 request for water power programs, which take a disproportionate reduction from FY 2012 level—a two-thirds reduction, in fact—whereas virtually all other EERE research program areas get increases of the same magnitude or more.

**Q22.** Why is there such a dramatic decrease in your funding request for this particularly promising area of clean energy generation?

**A22.** The Department believes that the \$20 million requested for water power research in FY 2013 will allow its Water Power Program to continue its ongoing projects to advance water power technologies and accelerate their market adoption. At this funding level, a number of water power technologies can be developed for both conventional hydropower and emerging marine and hydrokinetic energy technologies.

For hydropower specifically, DOE selected 16 new innovative hydropower technology development projects for funding in FY 2011, and that work will continue into FY 2012 and FY 2013. Additionally, DOE expects to continue its efforts to analytically quantify the benefits that conventional and pumped-storage hydropower provide to the electric grid, which can also support the integration of variable renewable resources like wind and solar. For marine and hydrokinetic (MHK) technologies, in FY 2013 activities are slated to focus on developing a suite of technologies that harness the energy from wave, tidal, and current resources. Specifically, MHK research is expected to focus on maintenance

and development of advanced open water test infrastructure for MHK devices and research into the costs and performance of innovative, early-stage MHK systems and components. Finally, DOE anticipates conducting resource and technology assessments in FY 2012 and FY 2013 to accurately characterize all opportunities for new water power development across the country. As data from these assessments become available and results from ongoing research and technology development projects are produced, DOE will evaluate the need for further innovative hydropower R&D.

### **QUESTION FROM SENATOR CANTWELL**

**Q23. Isn't a strong hydropower R&D program important to achieving the ambitious clean energy goals that the Department of Energy has identified?**

**A23. Yes, a strong hydropower R&D program is critical to meet the President's clean energy goals, including the goal of producing 80% of U.S. electricity from clean energy sources by 2035. Hydropower has a major role in the renewable portfolio. On average 6% of the nation's electricity and 70% of the renewable electricity has come from hydropower over the last decade, and it will continue to have a strong role in the renewable energy portfolio for the foreseeable future. Hydropower is clean, low-cost energy source with a well-developed industry that not only has a significant role in the renewable energy portfolio, but is also a critical part in the electricity operation and electrical power grid. Hydropower's quick response time has been critical to ensuring power grid reliability and security. Pumped-storage hydropower is the only reliable and cost-effective utility-scale energy storage available today.**

**In FY 2012, the Department will continue and complete a number of important water power technology research and development projects initiated in FY 2010 and FY 2011. The \$20 million requested in FY 2013 allows the Department's Water Power Program to continue its ongoing efforts to advance water power technologies and accelerate their market adoption.**



### **QUESTION FROM SENATOR CANTWELL**

**Q24. Do you believe that no further innovation or technological advance is possible for hydropower?**

**A24. The Department believes that further innovation and advancement of hydropower technologies are both possible and necessary to improve the efficiency and sustainability of existing assets that provide a substantial amount of energy and services for the nation, and to encourage the development of new sustainable hydropower generation. In FY 2012 and FY 2013, the Department will continue and complete a number of research projects that will develop and test new hydropower generation technologies and water utilization tools, demonstrate a state-of-the-art fish friendly turbine, develop standardized assessment guidelines for upgrading existing hydropower facilities, and quantify the benefits that conventional and pumped-storage hydropower provide to the electric grid (which can also support the integration of variable renewable resources like wind and solar). Finally, DOE anticipates conducting resource and technology assessments in FY 2012 and FY 2013 to accurately characterize all opportunities for water power development. The FY 2013 request would allow for the completion of these activities, after which the Department will have more information to evaluate the need for additional innovative water power R&D.**

### **QUESTION FROM SENATOR CANTWELL**

**Q25.** Please provide a summary of DOE's spending on hydropower R&D over the last two decades and measureable outcomes from the taxpayer investment.

**A25.** DOE has made hydropower R&D investments since 1991, but funds for such initiatives and programs were relatively limited compared to investments in recent years. Since Congress re-established the Water Power Program in 2008, DOE has spent a total of \$58.5 million on conventional hydropower R&D through annual Water Power Appropriations and an additional \$30.6 million for hydropower upgrades as part of the American Recovery and Reinvestment Act. Over the last five years, new opportunities in small hydropower have emerged as well as opportunities for upgrades of existing hydropower which results in increased generation. DOE's R&D has also included detailed laboratory tests of efficiency and fish survival rates of a fish-friendly turbine, which potentially provides a more sustainable option for producing electricity at an estimated 1,000 environmentally sensitive hydropower facilities and thousands of new potential developments.

Another leading role that DOE has played is in conducting credible resource assessments, which developers, states, and other federal agencies can use to inform decisions about infrastructure investments. For example, DOE recently completed a study that finds that there are 50,000 non-powered dams in the United States with the potential to add over 12 GW of capacity. The majority of these dams are operated by the U.S. Army Corps of Engineers, and power stations can likely be added to many of these dams without impacting critical habitats, parks, or wilderness areas while powering millions of households and avoiding millions of metric tons of carbon dioxide emissions each year.

The analysis did not consider the economic feasibility of developing each unpowered facility.

As part of the Recovery Act, DOE awarded \$30.6 million to create jobs and help modernize infrastructure, increase generating efficiency, and reduce environmental impacts at seven hydropower facilities. For example, the Abiquiu Hydroelectric Facility boosted output from 13.8 MW to 16.8 MW, increasing renewable energy generation capacity by 22%, and will produce enough energy to power 1,100 homes annually. Construction is in progress for several more of these modernization projects.

Over the last decade, hydropower has provided on average 6% of the nation's electricity and 70% of renewable electricity output annually. DOE has sponsored new innovative hydropower R&D at more than a dozen universities across the country.

## **QUESTION FROM SENATOR CANTWELL**

### **Renewable Energy Price Parity with Fossil Fuels**

Mr. Secretary, we clearly have to make some difficult choices with regard to the allocation of funding across energy R&D and other technology specific incentive programs. While there have been major improvements in many of these technologies in recent years, they still have some way to go before they can compete on an equal footing with fossil fuels and seize the expanding world market for clean energy.

**Q26.** What is your sense of the future with respect to the competitiveness of renewable energy technologies? When might we expect them to be competitive in the marketplace on their own?

**A26.** Renewables, such as wind and solar, are competing today in some electricity markets where the highest quality resources (wind speed and solar irradiation) can be tapped. Although there are currently policies in place (production and investment tax credits, accelerated depreciation schedules, State Renewable Portfolio Standards, Renewable Energy Credits, etc.) that help incentivize the emerging renewable energy market, DOE's goal is to enable all renewable energy technologies to compete with fossil fuels on an unsubsidized basis. This means that the true installed cost of renewable electricity, without subsidies, needs to be approximately \$0.06 per kilowatt-hour. Currently, land-based wind power at approximately \$0.08 per kW-hr is within striking distance of this goal. In some wholesale electricity markets accessible to high class winds and transmission, it is already competitive. In some areas of the country that have real-time pricing, high peak retail electricity rates and good solar irradiance, rooftop photovoltaics (PV) energy is becoming competitive.

DOE has been committed to promoting R&D in high potential renewable technologies that have specific goals to become cost competitive over time. For example, off-shore

wind technology is currently not cost competitive, however, through the development of deepwater wind technology, DOE has an interim goal of \$0.10 per kW-hr by 2020 for off-shore wind systems to be more competitive and an ultimate goal of price parity with fossil fuels by 2030.

DOE's Sunshot Initiative puts us on track to enable photovoltaics to meet this \$0.06 per kilowatt-hour goal by the end of the decade. Concentrated solar power technologies will require lower cost and higher performance materials before they are competitive on an unsubsidized basis.

Naturally-occurring steam or hydrothermal geothermal systems can be cost competitive if the resource is well characterized. The Department is now developing better exploration tools to facilitate resource characterization. Enhanced geothermal systems are still in the early stages of development but have an advantage over hydrothermal systems in that they could be deployed almost anywhere in U.S., not just where natural occurring geothermal exists (which is primarily in western U.S.). DOE's goal is to prove EGS feasibility by 2020 and cost parity with fossil fuels by 2030.

In addition, the Department sees hydropower playing a critical role in continuing to produce renewable generation while integrating higher penetrations of variable solar and wind power into the grid. For instance, a common current practice is to curtail wind power in times of lower demand. Instead of curtailing the wind generation, it can be used

to pump water to a higher altitude reservoir and then to use that potential energy when wind generation is low. Small hydropower and marine and hydrokinetic devices (current, tidal, wave, etc.) require more research and development but have the potential to be cost effective in the future.

Finally, renewable energy generation has nearly doubled over the last 3 years. Continued investment in research and development can help create domestic manufacturing jobs and make the U.S. more competitive in this global competition for alternative energy sources.

### **QUESTION FROM SENATOR CANTWELL**

- Q27. Do you agree with the many energy experts who argue that a predictable price on carbon designed in a way that minimizes price volatility is the most economically efficient and technology neutral way to realize greater energy efficiency and diversity?**
- A27. The Administration supports a Clean Energy Standard (CES) as the centerpiece of a strategy for creating clean energy markets in the power generation sector. A CES will provide the signal investors need to move billions of dollars of capital off of the sidelines and into the clean energy economy, creating jobs across the country and reducing air pollution and greenhouse gas emissions. By setting an annual target for electricity from clean energy sources, while allowing businesses and entrepreneurs to figure out the best way to meet it, the CES is a flexible, market-based approach that taps American ingenuity and innovation – and channels it toward a clean energy future.**

### **QUESTION FROM SENATOR CANTWELL**

**Q28. In your view, what are the most economically efficient policies to increase U.S. energy diversity without the need for government to pick technology or special interest winners or losers?**

**A28. The Administration supports a Clean Energy Standard (CES) as the centerpiece of a strategy for creating clean energy markets in the power generation sector. A CES will provide the signal investors need to move billions of dollars of capital off of the sidelines and into the clean energy economy, creating jobs across the country and reducing air pollution and greenhouse gas emissions. By setting an annual target for electricity from clean energy sources, while allowing businesses and entrepreneurs to figure out the best way to meet it, the CES is a flexible, market-based approach that taps American ingenuity and innovation – and channels it toward a clean energy future.**



## **QUESTION FROM SENATOR CANTWELL**

### **Investments in Grid Modernization R&D**

Mr. Secretary, you have called attention, for example in your FY 2011 budget request, to the nation's chronic underinvestment in R&D supporting the modernization of the electric power grid. I am referring specifically to grid-scale energy storage technologies and control technologies that will enable the integration of larger shares of renewable energy and give operators better tools to manage the grid in real time and make it more reliable and efficient. I am concerned with the substantial cuts to the Office of Electricity Delivery and Energy Reliability's R&D budgets in your budget request. For example, the Smart Grid R&D budget request for FY 2013 is 40 percent lower than the FY 2012 budget, and the request for energy storage R&D is 24 percent lower than last year. I realize that this year's budget request includes \$20 million for an Electricity Systems Innovation Hub, but I am concerned that funding for the new Hub comes at the expense of other programmatic priorities.

Q29. Could you explain your strategy for the Office of Energy Delivery, as it is reflected in the budget request?

A29. The FY 2013 budget request of \$143 million for the Office of Electricity Delivery and Energy Energy Reliability (OE) supports the President's commitment to an "all-of-the-above" energy strategy that includes critical investments in innovative technologies, tools and techniques that will enhance the capabilities of a modern power grid. As such, strategic decisions were made to prioritize activities providing a balanced portfolio of projects and activities that increase electricity reliability and security nationwide by taking a systems-level approach to grid modernization, developing the computational capabilities to improve system planning and operations, and emphasizing cybersecurity. FY 2013 also reflects our ongoing efforts to continue to leverage funding throughout the Department, with other Federal agencies and the industry to maximize cost effectiveness.

### **QUESTION FROM SENATOR CANTWELL**

**Q30: Does it make sense to take funds from other R&D programs within OE to pay for the Energy Systems Hub?**

**A30: Strategic priorities and tradeoffs were made to maximize resources and results while at the same time minimizing programmatic impacts. Investing in the Electricity Systems Hub will allow us to focus on the seam between transmission and distribution – a pinch point of grid modernization where power flows, information flows, policies and markets intersect – to tackle the critical issues and barriers associated with integrating, coordinating, and facilitating the numerous changes that are happening system-wide. The Hub activities will accelerate adoption of new technologies within a policy and regulatory framework that allows efficient utilization of assets and capital investment, including minimizing consumer costs for grid modernization.**

### **QUESTION FROM SENATOR CANTWELL**

**Q31. Can you share how you envision this innovation hub providing leadership in shaping our national pursuit of a transformed power system for the 21<sup>st</sup> century?**

**A31. The Hub will serve as a platform to test and evaluate new technologies and concepts developed by the Hub, DOE, or industry. Key stakeholders will convene at the Hub to observe, discuss, and understand the market, regulatory, and institutional implications of these advancements. It will serve as a center of excellence for sharing information and best practices and be a training ground for future engineers needed in a transformed power system.**

## **QUESTION FROM SENATOR CANTWELL**

### **Intermittent Resource Integration in the Pacific Northwest**

Mr. Secretary, with the growth of intermittent generation throughout the West – and especially the Northwest – there is a legitimate desire to find ways to integrate wind economically. To that end, I have concerns with the potential results of blindly relying on “markets” to meet consumer needs in an affordable fashion. My constituents suffered the consequences of the Enron-induced West Coast energy crisis, and I believe that any new proposal, which claims to address legitimate issues through the market, needs to be evaluated carefully. My concern is that we not presume that organized and centralized markets are the only or best solution without the due diligence to support that claim.

**Q32. Do you agree that utilities and generators in the west, including the power marketing agencies under your supervision, should look at all options to integrate intermittent resources and focus on the solution with the least cost to consumers?**

**A32. The decisions made by utilities, including the Power Marketing Administrations (PMAs), should always be made with the consumer in mind and the impact those decisions will have on consumers' bills. The electric sector is facing unprecedented changes as our nation moves towards cleaner energy sources. These changes must be done cost-effectively to ensure electricity rates remain affordable.**

**As the United States becomes fueled more and more by clean energy, we will need to improve our ability to integrate variable resources. All options are on the table, but the country cannot wait indefinitely; we must transition from studying to decision making sooner rather than later.**

### **QUESTION FROM SENATOR CANTWELL**

- Q33. How does the proposed Energy Imbalance Market (EIM) compare to operational measures within and between so-called balancing authorities? What approach to integrating intermittent resources do you think would be the most effective while impacting the consumers the least?**
- A33. Some utilities have developed a range of operational measures within and between balancing authorities (BAs) over the last few years. These include new wind forecasting techniques, intra-hour scheduling, reserve sharing, and a new electronic bulletin board for intra-hour transactions. These operational measures, which have been developed at low cost among groups of interested utilities, have been designed to work with the existing market structure. They help utilities maintain reliability and provide balancing reserves at reasonably low cost to consumers.**

**While these operational measures have provided benefits, they may face limitations as the amount of renewable resources increases over time. Currently, the balancing of load and renewable generation occurs within each individual BA without taking advantage of the natural diversity of variable generation and load fluctuations between different BAs. Spreading the variability of generation over a wider footprint and sharing diversity among a broader group of BAs could result in reductions in total balancing reserve requirements, potentially reducing costs to consumers and reducing wear and tear on existing balancing resources.**

**In an EIM, balancing requirements are consolidated amongst all participating BAs. An independent market operator conducts a continuous least-cost dispatch of available resources to maintain the balance of loads and resources across the footprint of the**

participating BAs. The netting of system variability over the entire EIM footprint reduces the amount of balancing reserves that must be set aside in anticipation of such movement (though the benefits of this netting can be constrained by transmission access to the offered flexibility). These measures may be more economically efficient than current practices and have the potential to lower the cost of integration. The operation of the EIM could also provide price signals that would facilitate the development of controllable loads (e.g., the smart grid) and incentivize optimal location of new resources. Finally, the wide area visibility and resource responsiveness facilitated by an EIM could improve system reliability.

Some of the diversity benefits of an EIM may be achievable through operational measures. These include the sharing of variable energy resource diversity between BAs and enhanced dynamic transfer capabilities. To further the evaluation of benefits that maybe gained from an EIM, DOE has partnered with utilities to evaluate the costs, benefits, and design requirements of a number of enhanced balancing market options, including an EIM. The Department expects to receive regular updates on the status of this work and is also monitoring other work streams on the topic underway in the West.

**QUESTION FROM SENATOR CANTWELL**  
**Standby Power Provisions of the Energy Independence and Security Act of 2007**

Mr. Secretary, I authored Section 524 of the Energy Independence and Security Act of 2007 (EISA 2007) which directs federal agencies to procure appliances and other equipment that use no more than 1 watt of electricity in standby power mode, if such products are available, and to procure products with the lowest standby power consumption otherwise. The requirement is stated in 42 USC 8259b(e) in the Federal Acquisition Regulation, under Subpart 23.2—Energy and Water Efficiency and Renewable Energy, which states that, in their procurements, agencies must purchase items listed on FEMP's Low Standby Power Devices product listing.

- Q34. To what extent are new products and appliances that meet FEMP standby power requirements available for off-the-shelf purchase?
- A34. In product categories where FEMP has had a long-standing low standby power program we have seen migration of the market towards production of low standby power products. New products are becoming available that meet the low standby power requirement.

In addition, new product categories frequently appear on the market. FEMP currently requires standby power of 1W or less for three product categories: cordless phones; desktop computers, workstations, and docking stations; and fax/printer machines. FEMP monitors market changes in order to identify opportunities for significant energy savings through new low standby power requirements. FEMP also coordinates with the DOE EERE Building Technologies Program, which establishes test procedures and standards for energy-consuming product categories.

### **QUESTION FROM SENATOR CANTWELL**

**Q35. What progress have federal agencies made to comply with these procurement guidelines?**

**A35. DOE's Federal Energy Management Program (FEMP) has assembled lists of qualified products and made them available to agencies. FEMP has worked with the Federal supply sources (DLA and GSA) to indicate compliant products within those systems. FEMP has also worked to incorporate the low standby requirements into other market transformation programs, such as the Electronic Product Environmental Assessment Tool (EPEAT) and ENERGY STAR. Data from the Federal Electronics Challenge suggests that over 90% of Federal purchases covered by EPEAT are of EPEAT-qualified models. The success of EPEAT and ENERGY STAR combined with the notable increase in models that meet the low standby power requirements suggest that agencies are purchasing an increasing number of low standby power products. FEMP's low standby power program helps make it easier for Federal agencies to find and comply with requirements.**



### **QUESTION FROM SENATOR CANTWELL**

**Q36. Specifically, what does the Department of Energy need to do, if anything, to meet these guidelines?**

**A36. DOE ensures sustainable procurement mandates are followed internally through continuous review and updates to the Department's contract writing system. All contracts are required to contain clauses and provisions to ensure offerors and contractors meet the Federal government's sustainable acquisition goals and initiatives.**

**The Department also ensures that all personnel involved in the procurement process are made fully aware of DOE's current policies and objectives through training courses and involvement in working groups.**

**DOE's official policies and progress for meeting sustainable acquisition mandates and goals are included in its annual Strategic Sustainability Performance Plan (SSPP).**

### **QUESTION FROM SENATOR CANTWELL**

- Q37. To date what have been the energy and financial savings resulting from FEMP's standby power requirement and what savings to you anticipate in the future?**
- A37. While Federal market penetration data regarding devices with stand-by power is difficult to acquire, FEMP estimates savings on the order of ~19,000MWh or ~2MW, approximately \$1.5 million annually in avoided Federal energy costs. This is based on preliminary analyses for a report being prepared by FEMP on Federal Energy Savings Potential, which will estimate savings potential by product category. FEMP is currently researching Federal sales volumes in order to better estimate Federal energy savings potential associated with FEMP-designated efficiency requirements and standby power requirements. FEMP has observed an increase in the national availability of low standby power products that is likely attributable to Federal leadership in this area.**

### **QUESTION FROM SENATOR CANTWELL**

**Q38. Please provide a summary of other DOE efforts to minimize standby power losses and the benefit they could provide American consumers.**

**A38. The Department is making great strides towards amending test procedures and energy conservation standards to account for energy consumption in standby mode and off mode to help consumers of these products save money. Per Section 310 of EISA 2007, all final rules establishing or revising a standard for a covered consumer product, adopted after July 1, 2010, shall incorporate standby mode and off mode energy use. To date, DOE issued standards that consider standby and off mode for clothes dryers, room air conditioners, furnaces, central air conditioners, residential refrigerators, and fluorescent lamp ballasts and has revised test procedures for clothes dryers, room air conditioners, furnaces, boilers, battery chargers, and external power supplies. DOE is currently engaged in a rulemaking to amend standards for Class A external power supplies and establish standards for non-Class A external power supplies and battery chargers. This rulemaking considers the energy consumed in standby and off mode, as required by EISA 2007. In the Notice of Proposed Rulemaking, DOE's proposal estimates that standards for battery chargers and external power supplies (in all modes of operation) could save an estimated 2.35 quads of energy cumulatively over the years 2013-2042. The benefit to the nation for this rulemaking, represented as the cumulative net present value of total consumer costs and savings from the standards is estimated to be \$6.83 billion over the years 2013-2042 (7% discount rate, in 2010\$). Until this proposal is finalized, these energy savings estimates are subject to change.**

## **QUESTION FROM SENATOR CANTWELL**

### **Supporting Domestic Regional Fuel Stocks Demonstrations**

Mr. Secretary, although the lack of qualified cellulosic biofuels has made it more difficult to meet the requirements of the Renewable Fuel Standard (RFS), I am encouraged that the DOE is coordinating with the U.S. Navy and the U.S. Department of Agriculture (USDA) to promote the development of cellulosic biofuels.

**Q39.** Can you tell me more about this partnership, and how it is developing regional strategies for cellulosic biofuels?

**A39.** DOE has a robust and growing partnership with the U.S. Navy and USDA to promote the development of biofuel technology for future military and civilian use. The collaboration is creating a better understanding of the biofuels needs of the military and the potential of the technology. In June 2011, Secretary Chu signed a Memorandum of Understanding (MOU) with Secretaries Vilsack and Mabus to request that funds be transferred through the Defense Production Act or other appropriate authority to DOD to jointly develop biorefineries that will produce military specification fuels. DOE also works closely with USDA on feedstock issues such as the Feedstock Regional Partnership and the Biomass Research and Development Initiative. Finally, DOE is continuing to work with USDA to better understand the regional needs and sustainability issues required for wide spread commercialization of advanced biofuels.

### **QUESTION FROM SENATOR CANTWELL**

**Q40. What level of support for RDD&D programs is necessary to reach the targets set in the RFS? Does the current budget request meet this need?**

**A40. The RFS has set aggressive volumetric goals for biofuels, such as ethanol. In FY12 the Biomass Program will have developed, demonstrated, and validated multiple integrated systems for the conversion of biomass to ethanol and other industrial alcohols cost competitively. This will conclude the program's R&D effort in this area and the data will be available to industry and others looking to commercialize these technology pathways. In addition, four commercial scale biorefineries based on cellulosic ethanol technologies have already broken ground and anticipate operations by FY 13. Leveraging this knowledge and investment to date on ethanol, including feedstock logistics and intermediates production such as sugar, the program is shifting efforts to producing drop-in fuels and bio-products in future years to displace the entire barrel of oil, and DOE believes the FY13 request is adequate to support the necessary RD&D needed to advance this effort.**

### **QUESTION FROM SENATOR CANTWELL**

**Q41. What can the DOE do to alleviate the current market reality that there are not enough qualified products, and how can the DOE support the qualification of renewable fuels, such as oil derived from woody biomass for process heat, to qualify under the RFS?**

**A41. Within the President's budget request, DOE is supporting the necessary research, development and demonstration (RD&D) of technologies that can help meet the requirements of the RFS. Support of the collaborative demonstration project with the Navy and USDA will allow the private market to make more informed investment decisions regarding renewable fuels. In fact, four commercial scale biorefineries supported by DOE have already initiated construction and will have the capacity to produce more than 80 million gallons of cellulosic ethanol by 2013. In support of the qualification of additional renewable fuels for the RFS, DOE conducts research and analysis and provides data and expertise related to qualifying cellulosic renewable fuels. As an example, for ethanol, DOE conducted the engine testing of ethanol blends at its national laboratories and supported pioneer cellulosic ethanol demonstration and commercialization efforts through the Biomass Program.**

## QUESTION FROM SENATOR CANTWELL

### **Future Electricity Generation from Coal**

Mr. Secretary, in an investment analysis published in November 2010, Deutsche Bank concluded that coal use for electricity production in the United States is likely to decline significantly in coming decades—from 47 percent in 2009 to 22 percent in 2030. Several factors contribute to coal's decline, including capital cost increases relative to gas, retirement of aging plants, increasingly stringent regulation of criteria pollutants, rising ash disposal costs, and financial barriers due to the regulatory uncertainty associated with greenhouse gas emissions. In contrast, EIA's *Annual Energy Outlook 2012 Early Release* projects that U.S. aggregate coal use will continue to rise and that coal will still account for 39 percent of U.S. electricity production in 2035.

Q42. Which forecast do you think is more likely?

A42. The two cited energy outlooks by Deutsche Bank and EIA are based on different assumptions in areas important to the future domestic energy outlook where there is considerable uncertainty, including: legislation to achieve major greenhouse (GHG) emission reductions, future natural gas costs, electricity demand assumptions, the competitiveness of gas and coal power plants with carbon capture and storage (CCS), and the impacts of new regulations impacting power plants.

The Deutsche Bank analysis is driven by a policy-oriented initiative, specifically, the identification of a low cost solution for achieving a 17-percent reduction in overall U.S. greenhouse gas (GHG) emissions by 2020 and an 83-percent reduction by 2050 relative to the 2005 level. Those specific policy goals were not represented in the *Annual Energy Outlook 2012 (AEO2012)* Early Release. If they were, the coal share of 2035 electricity would likely be lower.

## QUESTION FROM SENATOR CANTWELL

### Future Electricity Generation from Coal

**Q43.** Do you concur with the broad consensus that anticipated plant retirements, increasing regulatory obligations, and higher hurdles to capital finance for new coal plants will have a profound impact on U.S. coal consumption?

**A43.** **EIA is providing the answer to this question.** EIA is currently studying U.S. coal consumption in its Annual Energy Outlook for 2012 (AEO2012) and its findings will help to inform the Department's analysis. There are numerous factors including relatively slow electricity demand growth, low natural gas prices, high coal prices and upcoming environmental rules that will lead to some coal retirements and impact future coal use for power generation over time. However, DOE does not project as large an impact as is seen in the 2010 Deutsche Bank analysis. Deutsche Bank provides an analysis driven by an assumed policy-oriented initiative, where the primary goal of the study was to find a low cost solution for achieving the Administration's proposed 17-percent reduction in overall U.S. greenhouse gas (GHG) emissions by 2020 and an 83-percent reduction by 2050 relative to the 2005 level.

In addition, it appears that some of the assumptions used for Deutsche Bank's analysis may vary substantially from those used by EIA for the *AEO2012* Early Release Reference case. For example, in their analyses Deutsche Bank indicates that natural gas prices will remain in a range of \$4.00 to \$8.00 per million Btu in nominal dollars, with perhaps \$6.00 being their primary forecasting assumption. In the *AEO2012* Early Release Reference case, the nominal price of natural gas at Henry Hub increases from \$4.39 per million Btu in 2010 to \$8.98 per million Btu in 2030 and to \$11.48 per million



Btu in 2035. Another important difference between Deutsche Bank's analysis and EIA's *AEO2012* Early Release Reference case is the outlook for electricity demand, with Deutsche Bank projecting average electricity demand to increase by 0.5 percent per year between 2009 and 2030 and EIA projecting more rapid growth of 1.0 percent per year for this same time period.

In the area of coal-fired generating capacity retirements, Deutsche bank projects 152 gigawatts of capacity retirements (most likely nameplate) by 2030, which is considerably higher than the 33 gigawatts of net summer coal-fired capacity retirements projected in the *AEO2012* Early Release during the years 2011 through 2030. In the Deutsche Bank report, the authors indicate that the costs of some environmental rules not represented in EIA's *AEO2012* Early Release, such as the EPA's recently finalized Mercury and Air Toxics Standards (MATS) and forthcoming EPA rules on cooling water intake and ash disposal were represented in their analyses. EIA plans to represent the new MATS rule in the updated *AEO2012* Reference case scheduled for publication later this year.

## **QUESTION FROM SENATOR CANTWELL**

- Q44. In 2011 the Environmental Protection Agency (EPA) issued a number of new rules. As these policies go into effect, the price of coal-fired generation is expected to rise. The National Research Council's 2010 report "The Hidden Costs of Energy" showed that the average additional cost of coal generation due to emissions of SO<sub>2</sub>, NO<sub>x</sub>, and particulate matter was 3.2 cents per kilowatt-hour in 2005 and will decrease to roughly 1.7 cents per kilowatt-hour by 2030. How do the costs of reducing these emissions from recent regulations compare? If the additional cost of coal generation estimated by the NRC were included in EIA's modeling, how would that change the estimate for future coal consumption and the price through 2035?**

**How do the costs of reducing these emissions from recent regulations compare?**

**If the additional cost of coal generation estimated by the NRC were included in EIA's modeling, how would that change the estimate for future coal consumption and the price through 2035?**

- A44. EIA is providing the answer to this question. EIA has not performed an analysis of the potential impacts of the non-market externalities referred to in the NRC report. If externality cost were incorporated into pricing, coal plant operators would have an incentive to abate emissions in order to reduce impacts on generation costs and prices. However, there would likely be some increase in coal generation costs, some reduction in coal generation and increase in other generation sources, and some increase in electricity prices.**

## **QUESTION FROM SENATOR CANTWELL**

**Q45.** The Congressional Research Service documented in a 2007 study that significant bottlenecks in rail transport caused billions of dollars in losses in previous years, and that many billions of dollars of improvements would be required to avoid such problems in the future. How much would this increase the true cost of coal? What must be invested to ensure the national reliability of inputs to coal-fired power plants considering that that EIA also projects coal mining to become more geographically constrained?

**A45.** **EIA is providing the answer to this question.** The report cited is CRS No. RL34186,

*Rail Transportation of Coal to Power Plants: Reliability Issues*, September 26, 2007.

The report found (pp. 38 and 39) that:

“just as there are no public metrics that directly measure current rail system capacity, there are also no firm estimates of future capacity needs or costs....In summary, rigorous national-level assessments of rail system capacity needs and expansion costs do not appear to exist.”

In general, the limited availability of rail infrastructure costs and capacity data make their specific impacts on rail costs difficult to assess in the National Energy Modeling System used to produce the Energy Information Administration's *Annual Energy Outlook*. But, because projected changes in coal volumes are relatively small (0.4% growth per year in U.S. coal production) , significant capacity constraints and related impacts on projected transportation rates are not anticipated.

## **QUESTION FROM SENATOR CANTWELL**

### **Coal Reserves**

Mr. Secretary, the U.S. Geological Survey (USGS) has been updating data on U.S. coal reserves in the last few years. The AEO 2012 updated, and reduced, previous estimates for technically recoverable reserves of shale gas based on new data from USGS. The AEO 2012 does not mention its reference for coal reserves.

**Q46.** Why do you think the Energy Information Administration (EIA) has not updated its estimates of coal reserves? Do you find the latest USGS data for coal reserves to be reliable?

**A46.** EIA is providing the answer to this question. EIA frequently reviews options for updating coal reserve estimates, but has not under taken such an effort at this time because the known resource base appears large enough to meet current and expected demands. While the United States Geological Survey (USGS) does not maintain a centralized one-stop source of coal data for some key coal basins, data exists at state geological surveys, mining companies, and in localized USGS studies. Additionally, EIA has documented declining productivity in the Appalachian Basin (the main eastern U.S. coal producing region).

## **QUESTION FROM SENATOR CANTWELL**

**Q47.** In 2009 USGS published an analysis that included evaluations on how to calculate economic recoverability, estimating that 6% of the Demonstrated Reserve Base (DRB) was 'economically recoverable' without a rise in price per ton that is well beyond current EIA projections. How should EIA integrate the USGS analysis on economic recoverability of coal reserves into its analysis? If USGS estimates on economic recoverability were included in the AEO, how would the projected prices, exports, and production for all energy types be affected?

**A47.** **EIA is providing the answer to this question.** In the USGS report, the 6 percent relates to original resources, not to the Demonstrated Reserve Base (DRB). For clarification purposes, DRB represents a portion of original resources.

The differences in the assumptions and methodology used in the USGS and EIA analysis should be acknowledged. For example, EIA reports Estimated Recoverable Reserves (ERR) of Wyoming surface-mined coal at 15.3 billion short tons (bst) comparable to the "economically recoverable" estimate of 18.5 bst made by the USGS. The discounted cash flow analysis done by USGS assumes that future mining is done with today's technology so it also is an approximation of coal availability. (Note: the USGS assessed the Gillette field, which while it is the major part of all the coal in Wyoming, leaves out some coal included in the EIA estimate of ERR for all of Wyoming. However, this difference is not large and does not alter the comparisons.)

EIA has considered projected coal prices, recovered coal quantities, and available coal reserves in its latest long-term assessment of U.S. energy markets published in the *Annual Energy Outlook 2012 (AEO2012)* Early Release Reference case in January 2012. For the time horizon represented in the *AEO2012* Early Release Reference case Wyoming coal reserves are felt to be sufficiently abundant to meet the projected levels of

coal demand. For Wyoming's Powder River Basin, coal prices increase from \$12 per short ton in 2010 to approximately \$25 per short ton in 2035 (constant 2010 dollars). Based on the USGS assessment, the amount of recoverable coal in Wyoming's Gillette coalfield at \$25 per short ton would be about 40 bst. The *AEO2012* Early Release Reference case shows cumulative coal production of 12 bst for the Wyoming's Powder River Basin during the years 2010 through 2035. The USGS estimates of economically recoverable coal exceed the cumulative AEO coal production forecasts by a wide margin.

## QUESTION FROM RANKING MEMBER COONS

### ARPA-E

I am pleased to see a continuing commitment to the ARPA-E program. The budget request for \$325 million indicates the administration's commitment for breakthrough, transformational research. ARPA-E's focus on exclusively high-risk, high-payoff concepts - technologies promising genuine, high-impact innovation in the ways we generate, store and utilize energy has been essential. While the Department has invested heavily in conventional energy research, ARPA-E has augmented that original mission and acquired support from many different stakeholder interests.

Q1. With the Department's FY 2013 budget request, do you plan to continue solicitations in the portfolios already in place, establish new opportunities around potentially transformational ideas, or open one or more opportunities to a more general set of ideas that might evolve from public input?

A1. In FY 2013, ARPA-E plans to continue investing in some technology areas that are already represented within its research portfolio while also seeking out and identifying new high-impact areas of focus. For example, ARPA-E's Electrofuels program has successfully supported several technologies on the lab-scale that allow microorganisms to combine chemical or electrical energy with carbon to create liquid transportation fuels. Through the recently issued Electrofuels II Request for Information (RFI)<sup>5</sup> ARPA-E is seeking input from industry, academia, and other interested stakeholders on the steps and challenges necessary to scale-up and apply these and related technologies in a commercial-scale facility.

ARPA-E issued an Open Funding Opportunity Announcement (FOA) on March 2, 2012 to support transformational and disruptive high-impact energy R&D projects for energy-related technologies that enhance our nation's energy and economic security. These

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<sup>5</sup> DE-FOA-0000671: Request for Information (RFI) on Funding Opportunity Announcement (FOA) DE-FOA-0000671 for Chemo/electro-autotrophic Synthesis of Liquid Fuels at Scale, available at: <https://arpa-e-foa.energy.gov/>

projects are expected to include: renewable power, bioenergy, transportation, the electrical grid, and building efficiency, among other technology areas. The release of the Open FOA followed a three-week RFI, which produced public comments that were utilized in finalizing this FOA. Since ARPA-E issued an Open FOA in FY 2012, it does not plan to issue one in FY 2013, holding to a pattern of issuing an Open FOA every two to three years.

ARPA-E's prides itself on constant innovation and its organizational model reflects that by allowing a timeline from conception to execution that is greatly accelerated—typically only six to eight months. This allows ARPA-E to respond rapidly to newly emerging technological discoveries in its creation of new programs.



## **QUESTION FROM SENATOR COONS**

### **Quadrennial Energy Review**

Over the years, there have been calls for a national approach to formulate an integrated, forward-looking energy policy. Energy policy touches many different federal agencies. The Quadrennial Technology Review done by the Department of energy is broader than many review before it, but still does not consider Administration-wide priorities. The intent of developing a government-wide Quadrennial Energy Review (QER) is to bring greater coherence and interagency cooperation to Administration-wide energy projects, as well as point for effective dialogue with Congress on a coordinated legislative agenda. However, that very interagency cooperation will be required to make the QER possible, which makes this undertaking more complicated than its predecessors.

- Q2. How will the DOE, as the agency in charge of coordinated the QER process, deal with this complexity, ensure that the final product is useful, and engage with the many different entities across the Administration?
- A2. Pursuing the QER as a fully integrative effort from the outset with comprehensive recommendations later in the process is a critically important, but complex challenge. Discussions are underway about taking a “moving spotlight” approach in which attention would be focused sequentially on each of the six strategies defined in the QTR, which would allow DOE and its interagency partners to develop recommendations more quickly. The series of spotlight QERs would let the agencies tackle the overall complexity in manageable pieces.

To ensure that the final QER product is useful and to engage with stakeholders inside and outside the Administration, DOE will actively pursue stakeholder engagement, including engagement across the Federal government, as taken during development of the QTR. The DOE-QTR demonstrated a successful approach for substantive consultation that involved public comment on a framing document and a series of focus groups, topical workshops and a capstone workshop. I anticipate each spotlight QER will adopt a similar approach.

### **QUESTION FROM SENATOR COONS**

- Q3.** What preparation has been done already within DOE to prepare to execute the QER process? Are there impediments to implementing a QER, and if so, what are they?
- A3.** Discussions are underway currently, and DOE will fully brief Congress on our plans as soon as we are ready to announce them.

## **QUESTION FROM SENATOR COONS**

### **Biofuels – Replacing the Whole Barrel**

I applaud DOE's newfound focus on utilizing biomass to replace the "whole barrel" of products from crude oil – not only gasoline, but also diesel, jet fuel, and petrochemical products. Today, a variety of companies are seeking to scale technologies to produce drop-in and direct replacement fuels that can be seamlessly integrated into existing refineries, transported in existing pipelines, dispensed from existing tanks and pumps, and used to fuel any engine used today – as well as chemicals that can replace petroleum derived products used in plastics, packaging, clothing, and other fibers.

- Q4.** How is DOE utilizing programs across the department (in the Office of Science, EERE, and ARPA-E) to address biomass conversion to drop-in and direct replacement fuels?
- A4.** DOE's Undersecretary level technology team, which brings together the Office of Science, ARPA-E, and EERE's Biomass Program, coordinates efforts to conduct research, development, demonstration and deployment (RDD&D) activities to overcome barriers to commercializing advanced biofuels. Office of Science is focused on basic or fundamental R&D that increases knowledge and the suite of tools available to the research community. The Bioenergy Research Centers, supported through the Biological and Environmental Research program (BER) of the Office of Science, are pursuing the basic research underlying a range of high-risk, high-return biological solutions for bioenergy applications. Advances resulting from the BRCs will provide the knowledge needed to develop new biobased products, methods, and tools that the emerging biofuel industry can use. Also supported by BER, the Joint Genome Institute sequenced the genomes of key industrial organisms that produce novel enzymes for the degradation of biomass to sugar, providing the applied programs with the necessary information to make industrial grade improvements. One of ARPA-E's goals is to accelerate technology development from basic science to applied science through high risk high reward research that is not mature enough for the applied research programs. For example,

ARPA-E's Electrofuels program looks for solutions with non-photosynthetic biofuel production, and ARPA-E's PETRO (Plants Engineered to Replace Oil) program looks to find new paradigms in feed stocks and bioengineering techniques. EERE focuses on the applied research, development, demonstration and deployment (RD&D) activities, working in partnership with the industry that is commercializing the technologies to reduce costs, ensure reliability and help fund the first-of-a-kind technology. The Department's efforts support the goal to produce renewable gasoline, diesel, or jet fuel at \$3/gal by 2017.

### **QUESTION FROM SENATOR COONS**

**Q5. How are these efforts coordinated across various programs to accelerate technology development toward commercialization?**

**A5. The Department of Energy has established a team at the Undersecretary level that meets monthly to discuss key issues such as technical, economic, and market barriers to fostering the development of the U.S. biomass industry. This technical team focuses on setting goals that drive all three programs (Office of Science, ARPA-E, and EERE's Biomass Program) in a coordinated fashion. Additionally, staff from the three programs meet quarterly to discuss progress, new opportunities, and strategic direction. In December, 2012, EERE's Biomass program sponsored a "roadmapping" workshop, inviting industry as well as academics and national laboratories to present on the scientific barriers that have already been overcome, what new or remaining barriers exist and the best solutions for overcoming these through research and development from fundamental science through to demonstration.**

### **QUESTION FROM SENATOR COONS**

**Q6. Has there been any attempt to try and coordinate these various programs across agencies as well?**

**A6. The primary coordination mechanism for bioenergy activities across agencies is under the Biomass R&D Act of 2000 (as amended). The Act directs three primary efforts: an annual Initiative solicitation administered by the Department of Energy (DOE) and the Department of Agriculture (USDA); the Biomass Research & Development Board (Board); and the Biomass Research and Development Technical Advisory Committee.**

**The Board is an interagency collaboration chaired by DOE and USDA and composed of senior officials from federal agencies and the White House. The Board meets quarterly and currently includes members or representatives from the DOE, USDA, Environmental Protection Agency (EPA), National Science Foundation (NSF), Department of Interior (DOI), Department of Defense (DOD), and the White House of Office of Science and Technology Policy (OSTP). In their 2008 National Biofuels Action Plan (NBAP), the Board directed the formation of several Interagency Working Groups to facilitate the coordination of efforts across agencies related to feedstock production and logistics, conversion, and distribution infrastructure and end use.**

**In addition to formal coordination efforts that take place through the Board, DOE and USDA coordinate on a regular basis through other mechanisms and collaborate on projects such as the Regional Biomass Energy Feedstock Partnership under the Sun Grant Initiative. DOE is also working closely with DOD and USDA to advance the MOU that**

was signed by three Secretaries last year to assist the development and support of a sustainable industry for drop-in hydrocarbon biofuels in military applications.

## **QUESTION FROM SENATOR COONS**

### **Biofuels – Military Biofuels MOU & DOE Funding**

In the summer of 2011, President Obama announced a \$510 million Memorandum of Understanding (MOU) between the Secretaries of Energy, Agriculture, and the Navy to assist the development and support of a sustainable industry for drop-in hydrocarbon biofuels to power the Department of Defense and private sector transportation. The FY12 Energy and Water Development appropriations bill proposed by the Senate included language that would have given DOE the authority to transfer up to \$170 million from EERE into the Defense Production Act (DPA) for this initiative. Unfortunately, that language was not included in the final appropriations act. The FY13 budget request asks for authority to shift up to \$40 million in DOE biomass funding to DPA to support pilot-scale demonstrations, rather than the commercial production envisioned by the MOU.

**Q7. Has the DOE's role in this program shifted since release of the MOU, and if so, how?**

**A7. There has been no revision of DOE's role in the MOU. The MOU states an objective of supporting domestic commercial or pre-commercial scale advanced drop-in biofuel plants and refineries. DOE is planning on requesting an intended \$170M over multiple years to fulfill its commitment. This commitment will primarily come in two forms. First, we have requested \$40M in FY 13 funds, along with the authority to transfer these funds to the DPA, to support a competitive solicitation with DOD and USDA for a commercial scale biorefinery that produces drop-in military jet and diesel biofuels. In addition, DOE has requested \$20M in FY13 to competitively solicit innovative pilot scale demonstrations for producing military specification fuels. In FY12, we are also committing \$20M for innovative pilot demonstrations.**



### **QUESTION FROM SENATOR COONS**

**Q8. How did the DOE determine the request for “up to \$40 million” for FY13?**

**A8. The DOE fully supports the MOU between the DOD, USDA, and DOE. DOE is planning on a total of \$170M to support the initiative. The \$40M funding request was determined based on the total cost of each biorefinery being at least 50% cost-shared by the private sector and the recognition that the multi-year project does not need all of the money the first year. Furthermore, DOE’s experience in funding commercial and pre-commercial scale facilities suggests that the first year of funding includes critical go/no go decision points including NEPA compliance, and securing of private cost share that will determine when they can move into the more expensive construction phase. In addition to this \$40M, \$20M is requested in FY2013 along with \$20M in FY 12 for innovative pilots that will demonstrate initial scale up of technologies and provide essential data to produce military grade fuels.**

### **QUESTION FROM SENATOR COONS**

- Q9. Does the DOE still intend to contribute funding on the scale of \$170 million for this initiative?**
- A9. DOE continues to fully support the joint DOD/USDA/DOE MOU. DOE's intended commitment of \$170M will be requested over multiple years. We plan to invest \$60M in FY 2013 with \$40M going to the DPA procurement for a commercial scale biorefinery and \$20M for innovative pilot scale facility to demonstrate initial scale up of technologies and provide essential data to produce military grade fuels.**

### **QUESTION FROM SENATOR COONS**

**Q10. Does the DOE still support use of the DPA to fund commercial scale advanced drop-in biofuels plants?**

**A10. Yes, DOE is fully supportive of the DPA initiative to fund commercial or pre-commercial scale biorefineries and is requesting \$40M under the President's FY 13 budget request. In addition to the DPA effort, another \$20M in FY 13 is requested for innovative pilots that would produce advanced "drop-in" fuels for military applications. Our intended total commitment is \$170M and is subject to appropriations.**

## **QUESTION FROM SENATOR COONS**

### **Biofuels – Advanced Biofuels Hurdles to Commercialization**

Today, many companies seeking to produce advanced drop-in and replace fuels are on the verge of commercialization. These companies have proven their technologies at the pilot and demonstration scales, but nonetheless face significant hurdles in building bio refineries at a scale whereby the product volumes are large enough to be cost-competitive with existing refineries. The capital required to deploy a commercial scale bio-refinery is an order of magnitude higher than the cost of development or demonstration, and typically beyond the limits of venture capital. Moreover, private lenders generally will not offer low-cost debt to finance a first-of-its kind plant or technology. I believe there is a role for the Federal government to play in addressing this Valley of Death – which in turn will help meet our nation's energy, economic, and security goals.

**Q11. How does the DOE plan to help companies and investors address these hurdles, either through existing programs or new policy?**

**A11. DOE is addressing the hurdles associated with biofuel commercialization by funding a robust portfolio of projects that address the research, development, and deployment needs of the biofuels industry. Continued RD&D is critical to driving the cost of production down so that the industry can attract private sector capital and stand on its own without government incentives or subsidies. In addition to R&D activities, DOE is funding 21 integrated biorefineries ranging from pilot to commercial demonstration scales. The Department is also working with the Department of Defense (DoD) and US Department of Agriculture (USDA) toward the funding of commercial scale facilities via the Defense Production Act advanced biofuels initiative. DoD is an appropriate first user for advanced biofuels since they are the largest purchaser of fuel within the Federal Government system. The combination of these initiatives and continued price volatility in the oil markets could create the conditions necessary for the industry to overcome the challenges associated with biofuel commercialization.**

### **QUESTION FROM SENATOR COONS**

**Q12. Will the DOE be convening events and seeking input from potential investors to address the unique financial and commodity risks facing biofuels companies?**

**A12. DOE's Biomass Program continually seeks input from private sector investors and the biofuel financing community by participating in multiple, recurring forums including its annual Biomass Conference. The Biomass 2012 Conference will have an opening plenary session on Advanced Biorefineries that have obtained financing and broken ground as well as a break-out session on innovative financing strategies. The conference is scheduled for July 10-11, 2012 at the Washington Convention Center and is open to the public. There are several other investor events in which DOE participates, including the Annual Cellulosic Ethanol Financing Summit. Additionally, DoD, USDA, and DOE jointly sponsored an industry information exchange on March 30, 2012. This information exchange took place at USDA and the objective was to bring feedstock suppliers, biofuels conversion companies, and end users together to discuss process integration issues. Additional exchanges of this type are being planned.**

## **QUESTION FROM SENATOR COONS**

### **Biofuels – National Advanced Biofuels Consortium**

The DOE's National Advanced Biofuels Consortium (NABC) has had great success in developing technologies to convert lingo-cellulosic biomass feed stocks to biofuels that are compatible with the existing transportation infrastructure. Originally funded with \$35 million in American Recovery and Reinvestment Act funds, the NABC has successfully leveraged \$14.5 million of partner funds and recently announced two promising technology pathways would move forward.

**Q13.** How have the R&D successes of the NABC addressed technical risks of converting cellulosic material to drop-in fuels?

**A13.** The NABC was competitively awarded to bring together a multidisciplinary team of experts from academia, national labs and industry to assist the program in accelerating the development of biomass processing technologies for advanced biofuel production to industry-ready status. In Stage I of the NABC, six processing strategies were evaluated for their potential to successfully launch a pilot-scale biorefining facility by 2014. This process resulted in two strategies that convert lignocellulosic sugars to hydrocarbon fuels to be selected to move forward to Stage II. One strategy utilizes catalytic conversion of corn stover and loblolly pine and the other uses a proprietary yeast strain and hydrocracking to produce a diesel and jet fuel blendstock.

Additionally, the NABC identified two technology pathways which demonstrated considerable promise for achieving drop-in biofuels but were missing key data to fully complete the feasibility study. These pathways – hydrothermal liquefaction and hydropyrolysis - use thermochemical processing regimes to convert biomass to bio-oils, which can be subsequently upgraded to hydrocarbon fuels. These two technologies are on a track solely focused on addressing the primary technical and economic barriers that

were identified in Stage I. This is the best mix of routes and allows the consortium to focus resources where they will have the greatest probability of providing the best benefits.

### **QUESTION FROM SENATOR COONS**

**Q14. How will the FY13 budget request support the ongoing activities of the NABC?**

**A14. Since the NABC was funded through ARRA, all money has been obligated, and the FY13 request will not directly support ongoing activities in the NABC. The NABC is focused on developing two pilot ready routes to producing hydrocarbon fuels, but there are numerous other routes that show long term potential. The FY13 request supports a wide array of research, development, and demonstration that focuses on routes to hydrocarbon fuels through biomass-derived oil and carbohydrate intermediates. Additionally, the Biomass Program will continue to fund a FY12 solicitation that targets the construction of pilot scale biofuel production facilities that use terrestrial and algal biomass in FY13. The Biomass Program's diverse portfolio of research aims to enable many pathways by reducing the technology cost of producing cost effective lignocellulosic intermediate streams and final hydrocarbon fuels or blendstocks.**



## **QUESTION FROM SENATOR COONS**

### **Biofuels-Quadrennial Technology Review and Diesel and Jet Fuels**

The DOE's Quadrennial Technology Review (QTR) notes that in FY 2011, energy technologies addressing the transportation sector have been underfunded as compared to stationary energy by a ratio of 3:1. Within transportation, the QTR notes that "advanced hydrocarbons" especially for diesel trucks and jet aircraft should be a priority.

Q15. Do you believe there should be a different balance between transport and stationary energy within the DOE portfolio?

A15. Consistent with the DOE-QTR findings, the FY2013 budget emphasizes increased funding to technologies supporting the transportation sector.

### **QUESTION FROM SENATOR COONS**

**Q16. How does the FY2013 budget address the QTR findings that energy for the transport sector, and specifically biofuels (13% of funding) has been underfunded compared to clean electricity (51% of funding)?**

**A16. The Department provided a concerted effort to prioritize technologies related to the transportation sector across the Office of Science, ARPA-E, and EERE, resulting in increased funding in technologies such as biofuels and advanced batteries.**

### **QUESTION FROM SENATOR COONS**

**Q17. How does the FY 2013 budget request address the QTR findings that alternative hydrocarbon fuels, particular to replace diesel and jet fuel, should be an area of emphasis for DOE?**

**A17: The EERE Biomass program builds on success in converting cellulosic material to ethanol by increasing the focus on converting non-food cellulosic feedstocks to hydrocarbons that can be directly substituted for gasoline, diesel and jet fuel at competitive prices. ARPA-E continues to explore other innovative solutions that use biological processes to harness solar, chemical, or electrical energy directly, converting CO<sub>2</sub> into hydrocarbon fuels. The Office of Science-led Fuels from Sunlight Energy Innovation Hub (known as the Joint Center for Artificial Photosynthesis) is researching advanced non-biological materials that can mimic photosynthesis and produce chemical fuels directly from sunlight. In addition, the 3 Office of Science-led Bioenergy Research Centers are investigating the basic biological processes that underlie biofuels production, to improve our scientific understanding of these mechanisms.**

**In FY13, DOE has requested \$40 million to transfer to the Defense Production Act in order to support a competitive solicitation with the Department of Defense and the Department of Agriculture for a commercial scale biorefinery that produces military jet and diesel fuels. DOE has also requested \$20 million in FY13 to competitively solicit innovative pilot scale demonstrations for producing military specification fuels.**

## **QUESTION FROM SENATOR COONS**

### **Offshore wind**

The DOE's budget request for the offshore wind is \$95 million for FY 2013, and your program is beginning to shift from onshore to next-generation offshore technology applications. The DOE has indicated that it will be releasing a funding opportunity award soon. I worked with my colleagues to make it possible for this to happen in the FY 2012 in the Consolidated Appropriations Act of 2012 (P.L. 112-74). Offshore wind has struggled to get the first major large-scale projects in place, but initiating demonstration-scale projects is an important step.

**Q18.** What advancements does the DOE believe will be made in terms of cost reductions, technological improvements, and other advancements through this upcoming solicitation?

**A18.** Much of DOE's FY 2013 \$95 million request for the Wind Energy Program is cross-cutting and is intended to lead to technology advances that will benefit both the land-based and offshore wind industries.

On March 1, 2012, DOE announced its \$180M multi-year demonstration program via a competitive solicitation. An initial \$20 million will be available in FY 2012 as the first step in supporting the preliminary phases of up to six initial R&D projects resulting, after a later down-selection process, in up to four innovative offshore wind energy installations in United States waters. These offshore wind projects are expected to accelerate the deployment of breakthrough wind power technologies that will help diversify our Nation's energy portfolio, promote economic development and launch a new industry here in America.

While the specific technical improvements that will be proposed by applicants to this new funding opportunity are difficult to predict, DOE expects to support projects with improvements and innovations in areas such as turbine and drivetrain architecture, blade

and rotor design, support structures, foundation designs, electrical systems and other balance of system items that result in levelized cost of energy (LCOE) reductions. These improvements and innovations may reduce the LCOE by reducing initial capital, operational and maintenance, and lifetime costs. LCOE may also be reduced with technologies that allow improved access to higher wind speed environments and reduced plant losses. In addition, data collected by these demonstration projects will be disseminated to industry with the expectation that they will contribute to further technological advancements and LCOE reductions from future R&D.

DOE believes that this program is important because more cost-effective technology is needed to harvest the Nation's vast off-shore wind resources.

### **QUESTION FROM SENATOR COONS**

**Q19. Is there an advantage to encouraging multi-vendor turbine technology proposals so that multiple designs can be tested and so that costs can be spread across the program and more partners can be included in the program?**

**A19. The current \$180M multiyear solicitation is set up to initially evaluate multiple designs and then to down-select the best designs before more expensive construction phases. In addition, DOE is encouraging researchers and companies throughout the entire supplier chain to provide greater cost share leveraging and to decrease overall technical risks. Testing multiple turbines from one or more turbine manufacturers on a common foundation or multiple foundations at a given site may provide enhanced project benefits in the form of increased R&D results and engagement of additional partners for the same amount of DOE investment. For this reason, the Advanced Technology Demonstration Projects funding opportunity included language to encourage multiple turbines and multiple turbine vendors as follows: "Examples of potential candidate projects include, but are not limited to, a stand-alone single turbine, multiple turbines from one or more turbine manufacturers, or turbines that are a first phase of a planned larger commercial project."**

## **QUESTION FROM SENATOR COONS**

### **Weatherization Assistance Program**

I am concerned about the DOE's funding request for the Weatherization Assistance Program (WAP). WAP has turned in a solid success after a slow start on recovery act implementation. By early December 2011, the production goal for March 31, 2012 was reached. Secretary Chu announced local partners had weatherized more than the target number of homes-or more than 617,000. In 2011 alone, more than 200,000 homes were weatherized and more than 14,000 full-time jobs were filled by this program. However, DOE's budget request for FY 2013 significantly reduces the WAP below previous years' enacted funding levels. The budget request for \$139 million would be the lowest since 1996. In real dollars, it would be one of the lowest levels in the program's 30-year history.

**Q20.** Would there not be significant cuts to DOE's state and tribal partners based on a normal formula distribution?

**A20.** The Weatherization Assistance Program (WAP) experienced a \$5 billion investment over three years under the American Recovery and Reinvestment Act of 2009 (ARRA) in addition to receiving base funds in each fiscal year. Additionally, many states received extensions to continue weatherization work using ARRA funds. These funds have successfully enabled and accelerated weatherization work for hundreds of thousands of families, thereby bringing significant savings on home energy costs. Under the current fiscal situation, the \$139 million request for WAP ensures that, if fully funded, important weatherization work will continue to progress in FY13.

### **QUESTION FROM SENATOR COONS**

**Q21. Would the reduced funding request, if enacted, have an impact on the workforce that is in place now to support the program?**

**A21. The \$5 billion American Recovery and Reinvestment Act of 2009 (ARRA) investment for the Weatherization Assistance Program (WAP) expanded employment to more than 24,000 workers at peak production, compared to 7,500 to 8,000 nationwide at the state, local and contractor levels prior to the Recovery Act period. Additionally, during this time period, DOE received appropriations ranging from \$200 million to \$250 million each year and leveraged funds from other federal and private sources (LIHEAP; utilities, state funds, etc.).**

**The 2013 funding request of \$139 million will continue important WAP activities, but cannot replace the infusion of more than \$1.66 billion that was available each of the three years the WAP network had to use the ARRA funds.**



## **QUESTION FROM SENATOR SHAHEEN**

Recently, your agency proposed updated national energy efficiency standards for electric distribution transformers. Better transformers will reduce electricity losses in the distribution grid and lower electric bills.

However, the DOE proposal calls for only a very modest increase in the standards. DOE estimates that the proposed standard will save consumers about \$3.7 billion over 30 years. But a higher standard, which was recommended by the largest companies that make the transformers, would save almost four times as much electricity. In my own state, Warner Power makes transformers that will provide 40 percent savings compared with current technology while also creating good jobs.

**Q1.** Are you confident that these proposed standards are at the maximum achievable level as the law requires? Will you take another look at this before you issue the final standard?

**A1.** As required by statute, DOE must set standards that are technologically feasible and economically justified. DOE's analysis for the proposed rule recognized that many technologically feasible transformer types and designs are more efficient than the levels proposed in the notice of proposed rulemaking (NPR). Indeed, as required by law, DOE thoroughly assessed the technical and economic merits of these designs.

While standards more stringent than those DOE proposed would likely save more energy, the Department weighed these benefits within the context of several critical economic considerations, including: the financial impact on manufacturers, the ability of manufacturers to ramp up currently low-volume designs to meet the needs of the market, the availability of essential high quality steels, and the impact on competition in the steel supply and transformer markets. For the proposed rule, DOE tentatively concluded that these and other potential impacts of the more stringent energy efficiency levels would outweigh the projected benefits. In the recent public meeting on DOE's proposal for these

products, companies that manufacture transformers supported the standard levels proposed by the Department, likely due to their concerns over these same issues.

As stated in the NOPR, DOE will reevaluate the costs and benefits of various standard levels based on consideration of the public comments DOE receives in response to this notice and related information collected and analyzed during the course of this rulemaking effort. DOE may ultimately adopt standards that are either higher or lower than the proposed standards, or some combination of energy efficiency level(s) that incorporate the proposed standards.

## **QUESTION FROM SENATOR UDALL**

- Q1. With regards to the proposed Critical Materials Hub, what do you see as some of the milestones that you would like to lay forward for the next four years— in particular the research milestones that would define success? Where do you envision this research taking place – within DOE labs or at Universities or within industry?**
- A1. DOE's goal for the Hub is to create a coherent, full spectrum research team focused on conducting basic and applied research, development, and demonstration (RD&D) to reduce criticality for existing materials and prevent criticality of new materials that are essential to modern and emerging energy technologies. The Hub applicants were asked to direct R&D across the entire lifecycle including materials discovery and design, feedstock supply, processing, manufacture, use, recycling, and re-use. Success metrics would include: efficiency demonstrations in recovery from secondary sources; reduction in critical material use for a given application(s); and effective substitution of critical materials in a given application(s).**

**The specific milestones for the Critical Materials Hub will be determined once the applicant has been selected and will be based upon the specific research program proposed. Once awarded, the Department will develop goals and milestones that will be clear, precise, and measurable. These goals and their associated milestones will be continually reviewed by DOE, and the Hub will be subject annually to rigorous review of the RD&D program along with its management structure, policies, and practices.**

**There are multiple locations at which the research can take place. The Hub Funding Opportunity Announcement will be open to DOE laboratories, universities, industry, and other entities. In fact, the Hub model encourages consortia teams spanning multiple**

**disciplines and institutions. For these consortia, industry participation is highly encouraged to transition technologies quickly to manufacturing and commercialization. DOE will select all research locations based upon merit.**

### **QUESTION FROM SENATOR UDALL**

**Q2. What do you see are some of the criteria that must be met in the research activities for the Hub to be considered for funding beyond 2016?**

**A2. Funding of the Critical Materials Hub beyond five years will be based upon a number of factors including the extent to which the critical material needs persist, the extent to which there is a plausible approach for addressing those needs, the extent to which the Department determines the Hub model is best-suited to addressing these challenges, and the success or promise of the Hub's efforts funded over the course of the first five years.**

## **QUESTION FROM SENATOR RISCH**

### **Idaho Cleanup Vision**

**Q1: Can you please provide details of what the Department of Energy will be funding at the Idaho Cleanup Project, as it relates to Environmental Management's plan to accelerate the cleanup at Idaho by nine years to 2015? Is the 2015 vision still on track? Under this funding scenario what are the impacts to the cleanup scope and staffing?**

**A1: The FY 13 request for Idaho supports all the activities necessary to achieve the regulatory milestones, including:**

- 1) Sodium Bearing Waste treatment and tank closures by 12/31/2012.**
- 2) Submittal of the Calcine RCRA Part B Permit Modification to the State of Idaho by 12/01/2012.**
- 3) Processing of EM Transuranic waste to complete all campaigns by 12/31/2018.**
- 4) Continue wet-to-dry EBR-II used fuel transfers to complete by 2023 regulatory milestone date.**
- 5) Continue exhumations of targeted waste at the Accelerated Retrieval Project.**



## Department of Energy

Washington, DC 20585

January 29, 2013

The Honorable Andy Harris, MD  
Chairman  
Subcommittee on Energy and Environment  
Committee on Science, Space, and Technology  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On January 16, 2013 we sent you the edited transcript of the November 30, 2012, testimony given by Anthony V. Cugini, Director, National Energy Technology Laboratory, regarding research needs and priorities relating to unconventional oil and natural gas resources.

Enclosed is the Insert for the Record that you requested.

Also enclosed are the answers to two questions that you submitted to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher E. Davis", is written over a circular stamp.

Christopher E. Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures



855 and there are two ways you can invest. The government can  
856 invest in order to find ways to condemn the technology, or  
857 they can invest to find ways to further development new  
858 technologies, and my fear is that some of the investment  
859 being done over at EPA, and I am going to get Dr. Cugini next  
860 about DOE, may be the former, that what we want to do is we  
861 want to do research to condemn current technologies, not  
862 realizing the future is to find the next technological  
863 breakthrough, and it would seem to me that that--and I am  
864 just asking if you share that opinion. It seems that that is  
865 the best way we should be spending our money is actually to  
866 find out how to increase production through new technology,  
867 not finding problems with current production in order to just  
868 condemn it. I mean, that has no use if you are not going to  
869 also find ways to improve it. Is that correct?

870 Mr. MARTINEAU. I think you can improve the technologies  
871 that we currently have, and--

872 Chairman HARRIS. And that would do both things at once,  
873 right? It would increase production and help the  
874 environment.

875 Mr. MARTINEAU. Exactly.

876 Chairman HARRIS. Right, and I am still trying to figure  
877 out how drilling those wells at Pavilion by the EPA does the  
878 latter and not the former. I am still trying to figure it  
879 out. It is just to condemn current technology. It is



880 | incredible to me.

881 |       Dr. Cugini, let me end up with you in my last couple  
882 | minutes because, you know, this is about getting money into  
883 | the Department of Energy to do some things. Is that really  
884 | true, that there is no money spent right now on oil shale  
885 | R&D? I mean, that was the testimony before the Committee  
886 | this year.

887 |       Mr. CUGINI. Well, I think there has been some  
888 | historical--

889 |       Chairman HARRIS. Not historical--this year.

890 |       Mr. CUGINI. But those projects are still underway, so  
891 | at the University of Utah, we have some small amount of work  
892 | going on and--

893 |       Chairman HARRIS. And how much is a small amount out of  
894 | the \$15 billion DOE budget?

895 |       Mr. CUGINI. I don't have those numbers--

896 |       Chairman HARRIS. Can you get that number back to me?  
897 | And I will ask the Committee to make sure we make that  
898 | request of the doctor. Because I suspect it is really small,  
899 | which is just amazing to me because we have testimony, we are  
900 | looking at 120 years of oil, and I am not even counting the  
901 | things that is in shale oil and gas. We are just talking  
902 | about this one resource, 120 years. We are in the midst  
903 | of--the whole world would like to buy our oil and we are  
904 | sitting on it, and you are telling me there is one little

COMMITTEE: HOUSE SCIENCE, SPACE, AND  
TECHNOLOGY

HEARING DATE: November 30, 2012

WITNESS: ANTHONY CUGINI  
PAGE 42, LINES 883-898;

INSERT FOR THE RECORD

CHAIRMAN HARRIS REQUESTS A RECAP OF THE CURRENT AMOUNT OF MONEY  
BEING SPENT ON OIL SHALE R&D AT DOE.

RESPONSE: DOE's Office of Fossil Energy invested about \$14 million in oil shale related R&D during the FY08-FY10 time period. The research, which involved eight projects focused on developing new recovery, processing, and upgrading technologies, models, and simulation tools, was conducted by universities, industry, and national laboratories. Seven of the eight projects, all of which were funded using FY08-FY10 funds, have been completed. The only project that remains active from the FY08-FY10 investment is a Congressionally Directed Project with the University of Utah, which has roughly \$1.2 million in funding that remains to be costed. This project is scheduled for completion on September 30, 2013.

## QUESTION FROM CHAIRMAN ANDY HARRIS

**Q1. What recommendations do you have to resurrect and develop a Department of Energy oil shale research and development program? What are key items and considerations to guide oil shale research activities?**

**A1. We believe that with oil prices remaining at historically high levels, the private sector has a significant incentive to conduct appropriate oil shale research and development (R&D) work to move development toward commercialization. As such, the Administration has focused on facilitating that private R&D work. More than 75 percent of oil shale resources are located on Federal lands and the Bureau of Land Management (BLM) is responsible for leasing these lands for development. To date, BLM has embarked on two rounds of oil shale research, development, and demonstration (RD&D) leasing. The DOE does not intend to resurrect and develop an oil shale research and development program at this time.**

**Some key considerations for the safe, prudent, and environmentally sustainable development of domestic oil shale resource include: (a) quantifying and evaluating the environmental/safety risk inherent with oil shale development, (b) reducing the energy inputs required in oil shale extraction to improve the net energy balance of the process, (c) reducing water use, (d) reducing the potential for surface and/or subsurface water contamination from open pit or subsurface mining operations, or subsurface aquifer contamination resulting from products of in-situ retorting, (e) reducing the process water demand on surface and subsurface (aquifer) water resources and subsequent impacts on competing users, and (f) reducing carbon dioxide and climate change effects from oil shale development and associated operations.**

### QUESTION FROM CHAIRMAN ANDY HARRIS

- Q2. Please describe the types of activities you anticipate DOE supporting as part of its contribution to the interagency shale gas study effort. Can you ensure the committee that activities focused on issues such as safety and the environment are designed not to find problems or excuses to regulate but rather are focused on developing technological solutions to enable increased production? Beyond environmental issues, what other governmentally-appropriate research and development activities can be undertaken to advance expanded development of domestic unconventional resources?**
- A2. The Department of Energy is actively working with DOI and EPA to create an interagency research and development plan. DOE's research and development expertise is technology development. Therefore, I anticipate that DOE's role within the interagency research plan will be focused on technologies that improve safety and avoid/mitigate environmental impacts of unconventional oil and gas (UOG) development.**



**Department of Energy**  
Washington, DC 20585

January 30, 2013

The Honorable Ron Wyden  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On May 17, 2012, David B. Sandalow, Acting Under Secretary of Energy and Assistant Secretary for Policy and International Affairs, testified regarding S. 2146, the Clean Energy Standard Act of 2012.

Enclosed are the answers to 25 questions that were submitted by Members of the Committee to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Brad Crowell", is positioned above the printed name.

Brad Crowell  
Principal Deputy Assistant Secretary  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Lisa Murkowski, Ranking Member



## QUESTION FROM CHAIRMAN BINGAMAN

- Q1. A design goal for the CES is to minimize any regional inequity that could result from the program. Do you have any suggestions for improvements to the design of the proposed CES that would help in this regard?**
- A1. One of the President's principles for a Clean Energy Standard (CES) is to ensure fairness among regions. Different regions of the country rely on diverse energy sources today and have varying clean energy resources for the future. A CES must ensure that these differences are taken into account, both regionally and across rural and urban areas. Design choices should be informed by the full set of principles guiding CES development—recognizing that certain choices may introduce tradeoffs among design goals. A number of design choices can have implications for the distributional impacts of a CES. Two examples are the breadth and scope of resources that can earn credits and the extent to which existing (as opposed to just new) generation is credited.**

## QUESTIONS FROM SENATOR MURKOWSKI

- Q1.** When Secretary Chu was before this Committee as a nominee in January of 2009, he was asked about his comment that coal was his “worst nightmare” and responded by assuring members of this Committee that he believes “coal is a vital energy resource for our country” and that he would “aggressively pursue carbon capture and storage technology.” In January of 2011, President Obama proposed a Clean Electricity Standard, or “CES.” EIA’s analysis of the Clean Energy Standard bill estimates that over 20 percent of the existing coal plants in this country will be shut down by the year 2035 and that carbon capture and storage technologies will play no role in our energy mix going forward. This is all a bit contradictory to say the least.

How can one square the Secretary’s past assertions – and the President’s proposals – with the idea that our abundant and affordable, domestic coal supplies can or should play a role in our energy future?

- A1.** Coal has played an important role in powering the American economy in the past, and it will continue to play an important role in the future. The Administration is working hard to ensure that all of our domestic energy resources, including coal, can be used for years to come. Because a CES is a technology-neutral policy, the outcomes projected by models strongly depend on technology assumptions. In prior EIA modeling for Chairman Bingaman, a significant amount of carbon capture and storage (CCS) was deployed, but in the most recent EIA analysis of S. 2146, differences in dictated policy specifications as well as underlying assumptions led to different outcomes. For example, coal prices have increased since earlier analyses, and fewer carbon capture and sequestration demonstration plants are planned. That these small changes lead to different outcomes highlights the technology neutrality and compliance flexibility of a CES.

- Q2.** As written, S. 2146 appears to envision a purely national program, where only certain domestic clean energy resources may qualify. Canadian resources, such as hydropower, would not be eligible for participation even though states such as Vermont and Wisconsin now recognize Canadian hydropower as “renewable” for the purposes of their state programs. Does the Department view a prohibition on the inclusion of Canadian resources as a potential violation of our NAFTA obligations?

- A2. Currently the Administration has no position on the specific question of how Canadian energy resources should be treated within a CES. However, if Canadian resources, like hydroelectric power, were to receive credit, it should be done in a manner that preserves the overall goals of the CES and that is consistent with North American Free Trade Agreement (NAFTA) obligations.
- Q3. Currently, 31 states plus the District of Columbia have binding renewable or clean energy programs. Another eight states have voluntary clean energy goals. A threshold question for a new federal electricity mandate has been how to reconcile a federal program with the numerous state programs, all of which have different eligible resources and time tables. Under this CES bill, the Energy Department is tasked with “facilitat[ing], to the maximum extent practicable, coordination between the Federal clean energy program under this section and the relevant State clean and renewable energy programs.” How does DOE intend to accomplish this? Please be as specific as possible. How will DOE avoid preempting state programs? Won’t the federal program become the de facto floor upon which state programs can build?
- A3. If S. 2146 or a future Clean Energy Standard (CES) proposal were to become law, the Administration will implement the policy in a manner that is consistent with the direction and authority provided by Congress. Given that S. 2146 has not been enacted by Congress, the Department has no current position on how best to coordinate it with relevant state clean and renewable energy programs. The Department will continue to work closely with states on clean energy deployment.
- Q4. In your written statement, you note that “EIA’s modeling projects that the average household will pay five dollars less per month for energy in 2035 than in 2011 under CESA, largely thanks to our current energy efficiency policies.” However, Dr. Gruespecht from EIA testified that EIA’s modeling of S. 2146, the CESA, found national average electricity prices in 2035 rising over 18 percent above their Reference case level. How does an estimated 18 percent increase in electricity prices amount to five dollars less per month for the average household? What “current” energy efficiency policies are you including to justify your calculation? Are you including Administration proposals that are not in statute like the proposed Home Star program and/or a stand-alone Energy Efficiency Resource Standard?



- A4. While electricity prices do increase over the reference case in EIA's modeling of S. 2146, total household energy consumption decreases over time, due to current federal and state energy efficiency policies already enacted or implemented. This includes projected continued improvement in household appliance efficiency, increased adoption of efficient appliances due to higher energy prices, and declines in the average size of U.S. households. The decrease in consumption is large enough to offset any increase in rates over time, yielding a net reduction in household energy bills relative to 2011. The energy efficiency policies included in EIA's modeling are the same as those in the AEO2012 Early Release Reference Case, which includes enacted and implemented measures but not proposed measures.
- Q5. You note that within a Clean Energy Standard, an alternative compliance payment (ACP) can act as a safety valve for rising electricity costs and that S. 2146 provides "one example of how an ACP can be designed." How else could an ACP be designed?
- A5. The President has said that any CES must, as one of its core principles, protect consumers from rising energy bills. An ACP could be one element of an overall approach to achieving this and other important goals on a CES. If an ACP is included in a CES program, then as with other aspects of the design of a CES, there are a number of design choices involved in such a provision that would provide significant flexibility to strike the desired balance among the various objectives of the CES, such as protecting consumers and providing adequate incentives for clean energy deployment. For example, the adjustable design elements of an ACP include the initial level of the ACP, the rate of increase of the ACP level over time and the disposition of the ACP revenues.
- Q6. Your written testimony proffers that "[a]nother way to promote regional equity is by focusing on new clean generation, in order to give every region a similar starting point – while at the same time

crediting states that have been early movers.” How would such an approach actually work? How would such an approach differ from the method Chairman Bingaman lays out in S. 2146?

- A6. The approach in S. 2146 of establishing an eligibility date and giving credit to generators placed in service after that date is an example of a design approach that focuses on new clean generation. Other approaches, given the flexibility inherent in designing a CES could include adjusting the eligibility date or adjusting the explicit or implicit crediting of generation that predates the eligibility date, in order to seek a particular balance between promoting regional equity and crediting states that have been early movers.

## QUESTIONS FROM SENATOR CANTWELL

- Q1. I recognize that much of the debate around this Clean Energy Standard (CES) proposal focuses on the costs. Particularly from special interests that are determined to maintain the status quo against what I think is America's self-interest – making our electricity system cleaner, more diverse, and more distributed. To that end, I am puzzled as to why Energy Department models continue to project steady or even escalating costs for emerging technologies, when over time history has consistently shown the opposite.

My experience at a technology company taught me that innovation, scale, and American entrepreneurship always figure out how to drive down costs over the long term. We see that everywhere, particularly in the high tech fields whether it be cell phones, or laptops, or flat screen TVs, or solar panels. In 2000, a 50-inch plasma V sold for roughly \$20,000 dollars. The price fell to roughly \$4,000 in 2005. Today, these TVs sell for \$600-800 dollars. That's an 80 percent reduction from 2000 to 2005. And an additional 80 percent reduction between 2005 and 2012.

The same thing is happening with clean energy. Just this week, Bloomberg New Energy Finance released a report finding that average solar PV module prices have fallen by nearly 75 percent in the past three years. Solar power is now competitive with daytime retail power prices in a number of countries. The same Bloomberg report also found that these recent reductions in PV prices are likely to be sustainable, as they are primarily a reflection of reductions in manufacturing costs.

EIA's energy model is used extensively by policymakers and is very influential on our energy debates. Why are the projections so pessimistic about future costs?

- A1. The Energy Information Administration is an independent statistics and analysis agency inside of the Department of Energy. EIA uses its own independent estimates of technology costs in its modeling. These technology costs are typically assumed to (and do in this analysis) decline over time and with deployment. The Department of Energy is committed to making the investments in innovation that will ensure abundant and affordable American-made clean energy. These investments have the potential to significantly improve the rate at which technology costs decline. In addition, greater deployment of emerging technologies under policy instruments like a CES can create a market for innovation and further drive down costs.

- Q2. Any policy, such as a Clean Energy Standard or a price on carbon, needs to be compared to a business-as-usual or reference case. I'm not convinced the typical reference case includes all of the costs of inaction or business-as-usual.**

**In general, I think the debate on climate and energy policy has fixated too much on the potential costs of reducing our emissions, while ignoring the enormous costs of inaction. And the modeling efforts are partly to blame.**

**Other countries are seizing the tremendous economic opportunities that the global clean energy market offers the United States. Approximately \$7 trillion in new capital will be invested between now and 2030 in the global renewable energy market. How should we take into account the cost of losing out on this global market opportunity and falling further behind our global competitors like China?**

- A2. Although the environmental costs of inaction and potential international trade implications are not modeled by EIA in light of its statutory mission, they are very real, and as appropriate the Administration considers them during policy formulation. We are currently engaged in a global race to develop, manufacture, and deploy clean energy technologies, and with countries like China and Germany investing heavily in clean energy, we can't risk falling behind. For example, China's national government set a goal to achieve 15% of its total electrical generation from non-fossil sources by 2020, and the government has put in place a range of incentives and mandates to achieve that goal. In less than a decade China has emerged as a world leader in manufacturing renewable energy technologies. A Clean Energy Standard will establish a market for domestic clean energy technologies that will help ensure America's global leadership in this area in the years to come.**

- Q3. The real costs of greenhouse gas emissions are also not considered in these cost estimates. A recent National Research Council report surveyed the cost imposed on society from emitting each ton of carbon dioxide. It found that each emitted ton costs between a few dollars to hundreds of dollars – depending on the assumptions used.**

**Even at the low end of a few dollars per ton, that translates into tens of billions of dollars per year in costs on society. The cumulative impacts of historic emissions are hitting us already. Climate change impacts are estimated to be 10 billion dollars per year in my home state alone by 2020. These staggering costs should be a call to action because they are only going to accumulate and get worse if**

we continue to do nothing. In presenting the difference in costs between business-as-usual and a given policy scenario, why are these costs of inaction not included?

- A3. The costs of carbon pollution, mediated through climate change, are real and will affect every American. In addition to establishing a market for domestic clean energy technologies and providing the economic incentive for investment, a Clean Energy Standard can significantly reduce carbon emissions and other air pollution. Those benefits should be considered when designing policies like a CES.
- Q4. I believe one of the most important parts of any energy or climate policy is protecting consumers from any energy cost increases that result from the policy. This is especially important for the lower and middle classes that spend a higher fraction of their income on energy. While I'm not convinced that some of the cost estimates accurately represent how prices of new technologies actually behave, I'm curious what, in your opinion, is the best way (other than energy conservation and efficiency gains) to protect the incomes of lower and middle income families as we transition to a clean energy economy?
- A4. The President's Clean Energy Standard (CES) principles emphasize protecting consumers from rising energy bills. As you state, investing in energy efficiency is one way we can do this, and the President strongly supports complementary policies to make this happen. In addition, several policy design choices can minimize the impacts of a transition to a clean energy economy. For example, EIA's analysis of S.2146 has projected minimal increases in electricity rates between now and 2025. If costs do rise unexpectedly, an alternative compliance payment can set a ceiling on compliance costs and limit impacts on rates.
- Q5. Studies by the Congressional Budget Office (CBO), for example, have shown that auctioning carbon emission permits and returning the revenue to households in the form of equal lump sum payments is the best way to protect households from any higher prices that will result from limiting carbon emissions. What is your view of this approach to mitigating the impact on families, and how can we ensure that the most vulnerable American households are kept whole?

- A5. The President's Clean Energy Standard (CES) principles emphasize protecting consumers from rising energy bills. There are a number of design choices that can have implications for the distributional impacts of a CES, including any impacts on vulnerable households. Examples include the scope of resources that can earn credits, the extent to which existing generation is credited, the inclusion of an alternative compliance payment, the decision about how to use any revenues from such an alternative compliance payment, and the use of complementary efficiency policies.
- Q6. I appreciate how Chairman Bingaman has worked really hard to mitigate the regional impacts in this CES proposal. But some regional disparities are inevitable, as some regions have been early adopters of clean energy and would start with more.
- I'm wondering if we need a funding source to provide some transition assistance to those regions and groups that will be impacted the most. Do you think some transition assistance is necessary to prevent an economic shock to certain regions of the country and certain income groups?
- A6. It is possible to significantly mitigate the regional disparities of a Clean Energy Standard through careful policy design. For example, EIA's analysis of S.2146 has projected minimal increases in electricity rates between now and 2025. Under this type of gradual policy approach, no region of the country is expected to experience significant economic shocks.
- Q7. I was concerned to learn that in some cases the cost burden for utilities regulated under the CES might result in prices almost double those for exempted utilities. Would regulating carbon upstream reduce some of those problems and provide a more equitable cost share? And would regional disparities be minimized with a more economy wide approach to reducing carbon in our economy?
- A7. Price disparities will result from any system of regulation that exempts certain entities. Upstream regulations can, depending on their design, offer a way to increase the reach of a policy while reducing the number of regulated entities. Alternatively, the number of exemptions in any policy

could be reduced. In an economy-wide approach to reducing carbon, the extent to which there are regional disparities will depend on the details of the policy.

- Q8. I believe that putting a price on carbon, such as that contained in the clean energy standard, is necessary. It will unleash American ingenuity to diversify our energy mix and reduce our carbon intensity. But a price on carbon is not sufficient. We must also make critical investments - in research and development and in the grid itself. Integrating renewables into the grid demands new investments in the grid.

Washington state passed a renewable portfolio standard five years ago. Since then, renewable energy has taken off faster than anyone could have imagined. Wind, for example, now accounts for roughly 3,000 megawatts of my state's power capacity. Integrating this much wind into the grid so fast has produced challenges. In my home state, we have so much wind power that at certain times it has to be shut off. Two weeks ago, many wind farms were forced to shut down simply because we had too much cheap power. Too much cheap power that is both clean and sustainable should be a boon for our economy -- not a burden to bear.

A study by the Electric Power Research Institute estimated that the net investment necessary to create a power delivery system of the future would be between \$17 and \$24 billion dollars per year over the next 20 years. That same study found that every dollar of investment in the grid would return four dollars of benefits such as reduced outages, increased efficiency, and lower demand for energy at peak times.

Washington State has been leading on realizing this smart grid of the future that we so urgently need. The Pacific Northwest National Laboratory, PNNL, led a study to determine how willing homeowners are to use smart grid technologies; what benefits they found in being able to control their energy use according to pricing; and how much money they could save. Unfortunately, we're not making these critical investments.

The Department of Energy's 2011 Quadrennial Technology Review confirmed this, stating simply that we are "underinvesting in activities supporting modernization of the grid." This underinvestment delays the nation's transition to a more resilient, reliable, and secure electricity system that integrates renewables into the system. Do you believe that grid modernization efforts and making the grid smarter are important parts of bringing more clean energy online? If so, how can we continue to make progress on modernizing our grid?

- A8. Modernization of the electric grid is a complex and costly endeavor. To reduce cost impacts and make progress, and thus anchor our economy and standard of living, we as a Nation need to make smart choices about investments in clean energy, infrastructure upgrades and resource portfolio management. It is essential that states, regions and the Federal government coordinate on actions that serve common goals.

The Northwest, with strong support from the Bonneville Power Administration and the Pacific Northwest National Laboratory, has been helping lead the conversion to a clean energy future. Work on smart grid, transmission improvements, demand side options and enabling technologies have all added to our understanding of how to approach this complex modernization process.

The Department is committed to bringing more clean energy online and serving the public need.

To further accelerate this transformation will take new business models for utilities, states and regions; new cost effective technologies like energy storage and power electronics; and new partnerships that find common issues to solve. The FY 2013 budget request supports this, with key thrusts in policy and markets, cybersecurity, storage, transmission, smart grid and an electricity systems hub. Through these efforts, the Department will strengthen state and regional partnerships and pursue an effective path to modernization.



## **QUESTION FROM SENATOR BARRASSO**

**Q1. Are the following duties included in the responsibilities and functions handled by you and the Office of Policy and International Affairs at the Department of Energy?**

**Provide attention to vital energy concerns around the globe that affects U.S. security and economic interests.**

**Seek to ensure the availability, affordability and reliability of all forms of energy resources in support of U.S. national security and economic interests.**

**Formulate and implement U.S. foreign policy aimed at protecting and advancing U.S. energy security interests by effective management of U.S. bilateral and multilateral relations in the fields of petroleum, natural gas, electric power, efficiency, renewable energy, biofuels, nuclear, and other energy resources policy.**

**Advise on the U.S. government's international energy policy, policy deliberations, legislative developments, and diplomatic exchanges, especially on matters that may result in negotiations and representations abroad.**

**Provide substantive and coordinating responsibilities for U.S. policy towards key energy producing and consuming countries, including interagency efforts relating to global energy development and transportation.**

**Lead outreach to U.S. industry to develop and implement policies and actions in international affairs that fully consider U.S. energy security needs and expand markets for U.S. exports.**

**Conduct policy analysis that covers the broad areas of U.S. foreign economic policy in the areas hydrocarbon resources, alternative and renewable energy resources, commercial nuclear energy markets, electricity, energy efficiency, and energy poverty, and energy transparency and resource governance.**

**Support the dissemination and adoption of policies and measures that promote transparency in the management of international energy resources.**

**Advance commercially viable models to expand energy access to populations without access to electricity including technical expertise and assistance capabilities.**

**A1. The Office of Policy and International Affairs (PI) represents the Department of Energy (DOE) and the United States Government in interagency processes, intergovernmental forums, and bilateral and multilateral proceedings that address matters relating to the development and implementation of national and international energy policies, strategies and objectives. The Assistant Secretary**

coordinates and manages DOE cooperation with the governments of other nations, directly and through international organizations. The Assistant Secretary also negotiates and manages a variety of bilateral and multilateral agreements with other countries and international agencies for cooperation in research and development and for energy, environmental, and technology cooperation.

PI has primary responsibility for coordinating the efforts of diverse elements within the Department of Energy to ensure a unified voice in U.S. energy policy and international energy affairs. PI leverages technical expertise on energy issues and works closely with organizational elements within DOE, other Federal departments and agencies (including the Department of State and Executive Office of the President), national and international organizations and institutions and the private sector to coordinate and align national energy policy, and international energy agreements.

Additionally, PI is responsible for managing DOE's obligations as a statutory member of the Committee on Foreign Investment in the United States (CFIUS), an inter-agency committee established to identify and investigate the national security implications of certain foreign investments in the United States. As part of this responsibility, PI analysts conduct national security reviews of mergers, acquisitions, and takeovers of U.S. companies by foreign entities in order to assess their impact on the Nation's energy assets and its critical technologies.

**Q2.** What countries does your office engage with either bilaterally or multilaterally?

**A2.** The Office of Policy and International Affairs is responsible for overseeing the Department of Energy's multilateral and bilateral relationships and agreements. As such, PI engages with a broad range of countries around the world, including: Australia, Brazil, Canada, Chile, China, Colombia,

France, Ghana, India, Indonesia, Iraq, Israel, Japan, Kazakhstan, Mexico, Qatar, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Arab Emirates, the United Kingdom, and others.

Q3. Can you identify and describe some of your major international energy policies and projects your office is currently working on?

A3. The Office of Policy and International Affairs (PI) is currently working on a diverse range of major international energy policies and projects. The text below provides an indicative selection of such policy issues and projects.

- Implementation of sanctions on Iran under section 1245 of the National Defense Authorization Act of 2012 ("NDAA 1245"): PI is the Department of Energy's lead for diverse activities relating to the effective implementation of sanctions under NDAA 1245. PI supports the Secretary and Deputy Secretary in intensive, on-going outreach to key energy consuming countries that are being encouraged to "significantly reduce" their purchases of Iranian crude oil, as well as to key producer countries that have the ability to increase their crude oil production. In this capacity, PI analyzes opportunities for reductions in purchases, monitors the condition of global oil markets, engages (together with Department of State, Department of Treasury, and the staff of the National Security Council) in diplomatic engagement with countries contemplating reductions in purchases of Iranian crude oil, secures strong cooperation with producer countries, and develops overall sanctions policy with inter-agency partners.

- Iraq**: PI coordinates broad engagement of DOE elements (including the Office of Electricity Delivery and Energy Reliability, the Office of Fossil Energy, the Office of Intelligence and iCounterintelligence, and the Energy Information Administration) with Iraq – a country with great potential to impact global oil markets. In this role, PI staffs and supports the Deputy Secretary of Energy, who co-chairs for the United States the Joint Coordinating Committee (JCC) of Energy. The JCC brings together U.S. and Iraqi policymakers and senior officials to formulate effective strategies whereby Iraq can increase its production and export of crude oil; increase its production, effective utilization, and export of natural gas; enhance the reliability of the country's shattered electricity system; and improve its attractiveness for external investors, especially those from the United States.
- Clean Energy Ministerial (CEM)**: PI leads the high-level global forum which promotes policies and programs that advance clean energy technology, shares lessons learned and best practices, and encourages the transition to a global clean energy economy. CEM is focused on three global climate and energy policy goals: improve energy efficiency worldwide, enhance clean energy supply, and expand clean energy access. The 23 governments participating in CEM initiatives are Australia, Brazil, Canada, China, Denmark, the European Commission, Finland, France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Norway, Russia, South Africa, Spain, Sweden, the United Arab Emirates, the United Kingdom, and the United States.

- International Partnership for Energy Efficiency Cooperation (IPEEC): PI participates in a high-level international forum that provides global leadership on energy efficiency by identifying and facilitating government implementation of policies and programs that yield high energy-efficiency gains. IPEEC also aims to promote information exchange on best practices. The 15 members participating in IPEEC initiatives are Australia, Brazil, Canada, China, the European Union, France, Germany, India, Italy, Japan, Mexico, Russia, South Korea, the United Kingdom, and the United States.

Q4. What is the current number of staff positions at the Office of Policy and International Affairs?

A4. The Office of Policy and International Affairs has a budget for 103 full-time equivalent staff positions.

Q5. What is the budget for the Office of Policy and International Affairs at the Department of Energy?

A5. The Office of Policy and International Affairs enacted budget authority for FY12 is \$26.96M.

## QUESTIONS FROM SENATOR SANDERS

- Q1.** One potential challenge to ensuring that all technologies that qualify for credits or partial credits under the CES actually reduce emissions is related to natural gas fracking. Some reports indicate that fracking, in addition to presenting water quality concerns, also can lead to substantial additional emissions through methane release which when combined with emissions at a power plant stack, could make natural gas higher in carbon on a lifecycle basis that is commonly understood. What policies could Congress employ in a CES to ensure that natural gas emissions are evaluated on a full lifecycle basis?
- A1.** Natural gas is a vital and abundant domestic source of energy, and the Administration is committed to developing it in a safe and environmentally responsible manner. While there is some uncertainty about the precise lifecycle GHG emissions intensity of natural gas, natural gas is significantly less greenhouse gas-intensive than coal. The best available and up-to-date science should be incorporated into policy formulation and implementation to ensure that America's abundant natural gas resources are produced and consumed in the most environmentally responsible way.
- Q2.** Some states including Vermont have an energy relationship with Canada. Vermont uses Canadian hydropower to meet a substantial portion of our electricity needs. What recommendations do you have to account for this relationship through a CES, and also to ensure that to the extent American clean or renewable energy generators sell energy to Canada, that they receive reciprocal treatment?
- A2.** Currently the Administration has no position on the specific question of how Canadian energy resources should be treated within a CES. However, if Canadian resources, like hydroelectric power were to receive credit, it should be done in a manner that preserves the overall goals of the CES and that is consistent with the North American Free Trade Agreement (NAFTA) obligations.
- Q3.** What additional energy efficiency policies are necessary to complement a CES to ensure that we reduce carbon emissions in the power sector as quickly and significantly as possible in a cost-effective way?

- A3. A combination of a CES and complementary energy efficiency policies can achieve significant and cost-effective carbon emission reductions. The Administration supports a variety of complementary policies and measures to accompany a Clean Energy Standard, each tailored to the unique challenges of a given sector. These include appliance energy efficiency standards; the ENERGY STAR program; appliance labeling; weatherization; tax credits and grants for efficiency upgrades and energy efficiency technologies; the proposed Home Star rebate program; and partnerships with the private sector and states and localities to improve building and industrial energy efficiency.**
- Q4. Does the Administration support complementary programs such as on-bill financing whereby utilities can offer customers access to financing for energy upgrades, and use the resulting savings to pay for the upgrades over time on the customer's utility bill?**
- A4. The Administration supports a CES that is accompanied by complementary energy efficiency measures. There are many policy options available to support increased investment in energy efficiency. On-bill financing of energy efficiency upgrades is an example of a complementary measure that could work alongside a CES.**

## QUESTION FROM SENATOR MANCHIN

- Q1.** In your response to my questions, you said that the Clean Energy Standard is “designed to bring in coal, with clean coal technologies”, and you also said that there is, “tremendous potential” in carbon capture and storage technologies. While it is true that S. 2146 awards clean energy credits to coal fired generation that uses carbon capture technology, EIA has projected that there will be almost no generation from plants using CCS should this policy become law. What changes to S. 2146 would the Administration support that would result in the significant deployment of CCS-equipped coal fired power generation so we can maintain an “all of the above” energy strategy?
- A1.** Coal has played an important role in powering the American economy in the past, and it will continue to play an important role in the future. The Administration is working hard to ensure that all of our domestic energy resources, including coal, can be used for years to come. Because a CES is a technology-neutral policy, the outcomes projected by models strongly depend on technology assumptions. In prior EIA modeling for Chairman Bingaman, a significant amount of carbon capture and storage (CCS) was deployed, but in the most recent EIA analysis of S. 2146, differences in dictated policy specifications as well as underlying assumptions led to different outcomes. For example, coal prices have increased since earlier analyses, and fewer carbon capture and sequestration demonstration plants are planned. That these small changes lead to different outcomes highlights the technology neutrality and compliance flexibility of a CES.





## Department of Energy

Washington, DC 20585

February 13, 2013

The Honorable Tim Murphy  
Chairman  
Subcommittee on Oversight and Investigations  
Committee on Energy and Commerce  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On September 12, 2012, Daniel B. Poneman, Deputy Secretary, testified regarding the "DOE's Nuclear Weapon's Complex: Challenges to Safety, Security, and Taxpayer Stewardship."

Enclosed are the answers to 16 questions that were submitted by former Chairman Cliff Stearns, and Representatives Lee Terry and Michael C. Burgess to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis".

Christopher E. Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures



## **QUESTION FROM REPRESENTATIVE CLIFF STEARNS**

**1. The NNSA Act constrains the Secretary's authority, direction, and control of the NNSA, restricting the delegation of his authorities to manage this fundamental element of the Department only to the Deputy Secretary.**

**Q1a. Given that the Secretary is responsible both managerially and politically for all the Department's actions, how does this statutory restriction impact the Secretary's ability to supervise and manage effectively the NNSA?**

**A1a. If implemented effectively, the statutory provisions of the NNSA Act that limit the delegation of authorities by the Secretary and authorize the Secretary to direct DOE officials who are not in NNSA to review NNSA programs and activities and make recommendations to the Secretary provide the Secretary the ability to successfully supervise and manage the NNSA.**

**Q1b. How does this provision impact the ability for the Secretary to be adequately and correctly advised with respect to NNSA matters if the Secretary's staff is prohibited or inhibited from gathering information directly and independently from NNSA staff?**

**A1b. Neither this provision, nor any other provision of the NNSA Act prohibits or inhibits the sharing of information between, or within, the Department and/or the Administration. There are numerous instances of coordination, including gathering, sharing, and responding to information, that occur on a routine and daily basis between the two organizations.**

**Q1c. What would be the impact of removing this limitation on the Secretary's delegation of authority?**

**A1c. If this limitation were removed, the Secretary would have additional flexibility to delegate authority to accomplish the diverse missions of the Department, although the National Nuclear Security Administration could lose some of the high level direction (i.e., Secretary or Deputy Secretary) in effect under the NNSA Act.**

**Q1d. Are there any other arrangements in a Cabinet department of the executive branch in which the Cabinet Secretary is constrained from delegating his legal authorities to subordinates or from directing activities of a subordinate organization within the Department? If so, what are they?**

**A1d. It should be noted that the inclusion of a “semi-autonomous” organization within a Cabinet department is unique to the Department of Energy. Nevertheless, there are other arrangements whereby a Cabinet Secretary is constrained from delegating his legal authorities to subordinates. Our research revealed at least the following arrangements: Section 509 of Title 28 of the United States Code (U.S.C.) does exclude certain Departmental functions from the “functions” of the Attorney General. This indirectly limits the Attorney General’s authority to delegate “any function of the Attorney General,” as authorized in 28 U.S.C. 510. In addition, Section 50.102-1 of the Federal Acquisition Regulations (FAR) also constrains any and all agency heads, who are subject to the FAR, from delegating their authorities under Pub. L. 85-804 and E.O. 10789.**

## QUESTION FROM REPRESENTATIVE CLIFF STEARNS

**Q2.** It appears from the Inspector General's report on the Y-12 incident that the Management and Operations contractors at the Y-12 site had assumed responsibility for risk analysis and assurance that the security systems would work.

**Q2a.** Who provided the authority to the contractor to assume this responsibility?

**A2a.** The DOE directives approved by the Secretary or the Deputy Secretary assigns risk management decision responsibilities to the Program Offices. While the contractors are delegated the responsibility for conducting vulnerability assessments associated with the protection of Special Nuclear Materials (SNM) and nuclear weapons. Risk acceptance authority is reserved for Federal managers. However, I signed both the March 16, 2010 Safety and Security Reform Plan and the subsequent revision of DOE Order 470.26, now numbered Order 227.1, that removes the requirement for contractor corrective action plans to be government approved when security deficiencies are appraised. Subsequent to that at Y-12, DOE's oversight policy and NNSA Policy Letter NAP 70.2, approved by the NNSA Administrator *Physical Protection* allowed for broad decision-making authority for contractors, including the ability to make inherently governmental risk decisions without effective Federal review.

**Q2b.** Was the authority transferred formally, in a document? Would you please supply the document to the Committee?

**A2b.** The contractor Vice President for Safeguards, Security and Emergency Management was granted CSA authority by the Federal Y-12 Site Office in September 2006, citing the provisions of a DOE directive that severely limit contractor authorities regarding the inherently governmental function of risk acceptance. However, in 2011, DOE Order 227.1 and NAP 70.2 decreased requirements for federal performance assurance and

significantly expanded contractor authorities, without clearly identifying their limits.

YSO did not publish any amendments to its original delegation of contractor CSA authority, thus creating ambiguity that allowed the B&W CSA to make inherently governmental decisions regarding ongoing upgrades of the Y-12 protection systems.

**Q2c. Did the Secretary approve delegation of this risk to the contractor? And if not, should he have approved this delegation?**

**A2c. In Delegation Order No. 00-003.00B to the Under Secretary for Nuclear Security, the Secretary of Energy delegated his authority for "Security Activities." In turn, the Administrator further delegated Sections 1.1 through 1.5 to the Chief, Defense Nuclear Security. The Chief, Defense Nuclear Security has further delegated this authority to site-level Federal managers for implementing physical security programs to the facilities under their purview. NNSA Administrative Policies on Physical Protection (NAP 70.2) and Information Security (NAP 70.4) identify specific areas where Contractor Cognizant Security Authorities could exercise authority. However, those authorities are risk-based requiring Federal acceptance for high risk assets.**

**Q2d. Do other sites have this same delegation? If so, please identify them?**

**A2d. Yes. NNSA Administrative Policies on Physical Protection (NAP 70.2) and Information Security (NAP 70.4) identify specific areas where Contractor Cognizant Security Authorities could exercise authority.**

**The Federal Cognizant Security Authority has final approval responsibility for risk analysis and assurance that the security systems are effective.**

## QUESTION FROM REPRESENTATIVE CLIFF STEARNS

**Q3. Do you agree with the assessment that productivity and cost overruns are a result of burdensome agency oversight?**

**A3. No. There is no objective evidence to support the assessment that productivity and cost overruns are the result of burdensome agency oversight. The NNSA operates within a framework of legislative authorities and responsibilities and in partnership with our Contractors for mission success. The recent unacceptable incident at Y-12 demonstrates that the NNSA has fallen short of our own expectations and we face continuing challenges in our goal of continuous improvement.**

**Q3a. What is the root cause of productivity and cost overruns in weapons complex projects?**

**A3a. There is no single root cause for cost overruns in weapons complex projects. The very nature of NNSA's projects are that they are state of the art, complex, and executed to provide facilities for high hazard, high consequence activities. Recognizing these challenges, NNSA has made the following organizational changes to provide better centralized control of programs and projects and to provide better accountability: (1) established the NNSA Office of Acquisition & Project Management (APM) to improve our execution of major construction projects; (2) established the Office of Infrastructure and Operations to work towards operational excellence and infrastructure recapitalization; (3) streamlined the Office of Defense Programs to focus on core missions of Life Extension Program (LEP), surveillance, and weapon-related Research and Development, Trials and Assessment (RDT&A); (4) revitalized NNSA's Office of Management and Budget to drive towards excellence in cost analysis and budgeting; (5) redesigned Field Organizations to align the organization and provide effective**

Management and Operating (M&O) oversight; and (6) implemented the Strategic Performance Evaluation Plan that contractually integrates performance outcomes. Large scale, unique nuclear projects have inherent risks to scope, schedule and cost. NNSA will continue to sharpen its risk analysis in order to inform sound resource decisions that support national program priorities.

#### QUESTION FROM REPRESENTATIVE CLIFF STEARNS

4. If the NNSA moved to a performance based oversight model, essentially allowing for self-regulation/oversight of high consequence but low probability accidents, how could the Secretary of Energy fulfill his responsibilities for ensuring safe and secure operations at DOE?

a. What role would Health, Safety and Security (HSS) play in this effort?

A4. The Department of Energy-wide (DOE) and National Nuclear Security Administration's (NNSA) oversight models overlap and currently consist of a combination of elements that are performance-based and transaction-based. Under these models, the Office of Health, Safety and Security (HSS) conducts independent (i.e., independent of all line management functions) oversight of DOE and NNSA Federal and contractor performance in the areas of safety and security. Having HSS independent oversight of NNSA safety and security programs is critical for the Secretary of Energy to make independent safety and security performance judgments related to NNSA operations, including in the areas of nuclear safety and nuclear security.

The current DOE regulatory model provides the NNSA Administrator the authority to take enforcement actions and issue civil penalties against NNSA contractors that violate the Department's worker safety, nuclear safety, and classified information security regulations. (HSS implements these functions on behalf of the Secretary for non-NNSA contractors). HSS's role with respect to NNSA is to conduct investigations and make recommendations to the NNSA Administrator regarding enforcement actions. Any regulatory reform needs to provide certainty into whether existing Departmental safety or security regulation applies to NNSA or its contractors, or whether the Secretary or the



**NNSA Administrator has the authority to impose civil penalties for violations of those regulations.**

**As indicated in the Statement of Administration Policy (SAP) on the House NDAA (H.R. 4310), the Administration strongly opposes provisions that severely hamper external, independent oversight by the Defense Nuclear Facilities Safety Board; move regulatory authority from independent offices and agencies to the NNSA Administrator; require a weaker standard of contractor governance, management, and oversight; and eliminate DOE's flexibility to determine the appropriate means of assessing the unique risks that it confronts in its facilities. By lowering safety standards for the nuclear weapons complex and reducing requested funding for health, safety, and security, these provisions would weaken protections for workers and the general public.**

**QUESTION FROM REPRESENTATIVE CLIFF STEARNS**

**Q5. NNSA has initiated the development of separate policies from DOE for safety and security. Do you support the development of a two-track system of policy and oversight within DOE?**

**A5. NNSA has in some cases developed separate security directives from DOE; they did not develop separate safety directives. To achieve one unified security policy for DOE, including NNSA, I have directed NNSA to work with HSS to make recommendations for any necessary updates to Departmental directives to provide sufficient clarity to establish the security objectives that must be met by all elements of the Department. NNSA would then provide direction to its subordinate elements that would provide approved methodologies and procedures to ensure that the Departmental objectives are met. DOE's oversight role in such an environment is to focus on demonstrating, primarily through rigorous performance testing, that site programs, as implemented, do meet DOE safety and security objectives.**

**Q5a. Do you or the Secretary review and sign off on these NNSA policy requirements?**

**A5a. We review them when final and, if the Secretary or I have an issue with them, we inform the Administrator who then must make changes to address our concerns or withdraw the NNSA policy requirement.**

## QUESTION FROM REPRESENTATIVE CLIFF STEARNS

**Q6. During the hearing, questions were raised about federalizing the protective force or putting the U.S. Army in charge of perimeter protection at Y-12. To the extent federalization or military guard force has been examined by the Department in recent years, what has the Department determined?**

**A6. Since the early 1990s, the department has intermittently considered federalization because of a variety of security challenges, often involving actual or potential work stoppages by contractor protective force union employees. Over the last ten years, several studies have been conducted which resulted in various recommendations. In one such study, the Department of Energy (DOE) performed a review in 1992 and concluded there was no clear evidence that federalization of protective forces would significantly save costs or improve security. In contrast, a 2004 DOE study group, examining ways to strengthen DOE's security posture after September 11, 2001, recommended federalization to better support tactical responses and to promote uniform, high-quality security across sites. The Department did not implement the recommendation due to the more urgent priority of immediately improving protective force capabilities within existing organizational and contractual arrangements.**

**In January 2009, National Nuclear Security Administration (NNSA) and the Office of Health, Safety and Security (HSS) issued a report to the Deputy Secretary regarding whether NNSA sites would be better served by contractor or federal protective forces. NNSA and HSS concluded that the major benefits of federalization could be achieved through the existing contractual model. Also in 2009, partly in response to a union coalition calling for federalization, NNSA and DOE's HSS began focusing on protective force initiatives to address some of the goals that federalization was meant to accomplish.**

In 2010, the Government Accountability Office (GAO) published report #10-275, **NUCLEAR SECURITY: DOE Needs to Address Protective Forces ' Personnel Issues**, which summarized many of the previous studies and concluded once again that a definitive decision regarding federalization versus continued contracting of protective force services for DOE's sites could not be reached; however, the GAO suggested that the issue be revisited if implementation of recommendations from an enhanced career longevity and retirement options study failed to bring positive results.

The implementation plan for the enhanced career longevity and retirement options study was signed by the Secretary and provided to Congress in January 2011.

In December 2012, Secretary Chu asked a panel comprised of Norman Augustine, C.D. Alston, and Richard Meserve for advice on Y-12 security. Two out of the three recommended federalizing the workforce. These recommendations are being considered along with other DOE staff inputs as DOE considers the longer-term response to both security at Y-12 and the broader range of security issues at the nuclear enterprise.

#### QUESTION FROM REPRESENTATIVE CLIFF STEARNS

**Q7. Why is it important to allow foreign nationals to visit or work at the National Weapons Laboratories?**

**A7. The reason why it is important to allow certain foreign nationals to visit or work at the nuclear weapons laboratories is to promote diplomacy and to promote cooperative educational and scientific advancement. Spending some time visiting or working at a laboratory builds international confidence and transparency. Since the Manhattan Project, certain foreign nationals have visited or worked at the nuclear weapons laboratories, making important contributions. Congressionally approved treaties, such as the 1958 U.S./UK Mutual Defense Agreement (MDA), allow for technical information exchange in certain areas of atomic energy. These exchanges facilitate the development of defense plans, evaluation of adversary capabilities, development of nuclear delivery systems, and the research, development and design of military reactors, all of which enhance U.S. nuclear defense. While certain security-cleared UK individuals do have access to restricted areas in furtherance of their work under the MDA exchanges, the majority of foreign nationals working at the labs have no access to restricted areas. In addition, NNSA invites foreign nationals to its national weapons laboratories in order to further the organization's mission to strengthen the nonproliferation regime and enhance the security of nuclear materials and facilities around the world. NNSA and the laboratories provide training programs in the area of nuclear security. These training programs strengthen nuclear security practices at facilities around the world, and provide an ideal environment for sharing effective tactics, techniques, and procedures with our foreign counterparts. This process adheres to security clearance and export control review procedures in order to ensure that all participants are properly vetted.**

Finally, the nuclear weapons laboratories, like all of the laboratories in the DOE Complex, are science laboratories. While a significant portion of that science is dedicated to the national defense, scientists at the nuclear weapons laboratories are world leaders in other diverse disciplines including, but not limited to, space and astronomical science, nuclear energy research, materials science, environmental science, geology, chemistry, renewable energy research, biological sciences, advanced computing applications, and other technical areas. Cutting edge science is performed collaboratively and necessarily with specialists from around the world.

**QUESTION FROM REPRESENTATIVE CLIFF STEARNS**

- Q8.** Given the United States Enrichment Corporation's (USEC) public statements of their intent to cease operations at the gaseous diffusion plant in Paducah, Kentucky, what planning has DOE done to prepare for any potential transition of the facility from USEC's control to DOE's?
- A8.** Although USEC has informed DOE of the "potential" return of the Paducah gaseous diffusion plant (GDP) facilities, USEC has not yet provided the required formal notification under the terms of the USEC lease with DOE of their intent to return the leased facilities. Depending on USEC's commercial need to keep a portion of the GDP for certain activities and the time required by USEC to successfully meet its requirements under the Lease, returning the GDP to DOE (which involves coordination with the Nuclear Regulatory Commission) will take USEC quite some time. DOE is making prudent efforts to plan for the eventual return of the plant from USEC and for the anticipated responsibilities for the surveillance and maintenance followed by the deactivation and decommissioning. In the meantime, DOE is relying heavily upon its successful USEC GDP transfer experience at the Portsmouth site in Ohio, completed in 2011, and lessons learned from the Oak Ridge Gaseous Diffusion Plant decommissioning in its plan for the return and shutdown of the Paducah GDP.

**QUESTION FROM REPRESENTATIVE CLIFF STEARNS**

- Q9. What resources would be required for the transition? Has DOE incorporated those resource requirements into its budget process?**
- A9. Although USEC has not yet provided the required formal notification under the terms of the USEC lease with DOE of their intent to return the leased facilities, DOE has identified a range of costs to support transition activities over the next several years and is incorporating those costs into the budget process.**



**QUESTION FROM REPRESENTATIVE CLIFF STEARNS**

- Q10. How will the transition from NRC regulation to DOE operation change the conduct of security at the site and number of security employees? How will those changes impact the site's security employees?**
- A10. USEC has not provided the required formal notice to DOE regarding its intent to return the leased facilities to DOE or its plans to accomplish the turnover requirements as required by the lease. It would be premature to identify any specific impact to the site's security posture or personnel with the specifics of the transfer still unknown. DOE will conduct a security risk assessment once DOE knows when the facility will be returned and can establish the condition of the facility upon its return. This security risk assessment will consider the status and condition of the nuclear materials and classified information at the GDP in order to determine what the appropriate levels of security necessary to ensure protectiveness and comply with applicable regulations.**

QUESTION FROM REPRESENTATIVES LEE TERRY AND MICHAEL BURGESS

B&W Response

Q1. Please share with the committee a copy of the B&E response to the show cause letter.

A1. Copy of the response was provided to the Committee.

**QUESTION FROM REPRESENTATIVES LEE TERRY AND MICHAEL BURGESS**

**Q2. The show cause letter did not raise the issue of whether or not B&W and G4S fulfilled their responsibilities to keep NNSA informed of issues. Did they?**

**A2. No, they did not. B&W and G4S are required by contract and Departmental directives to implement effective contractor assurance systems and performance assurance programs to measure the effectiveness of their security program. Those programs are intended to promote continuous improvement, but also to inform and assure NNSA. However, self-assessments conducted by B&W and G4S often contained insufficient information regarding security program implementation, failed to identify issues, or lacked analyses to support the conclusions. Consequently, the contractors' reports did not accurately inform NNSA about the effectiveness of existing security programs to support management decisions regarding future security activities.**

**Q2a. Why did it take so long for security system vulnerabilities to become known outside the contractor community?**

**A2a. In addition to the weaknesses in contractor assurance systems, numerous examples of inadequate Federal oversight were evident. Oversight and assessment activities by the former Y-12 Site Office did not effectively evaluate all safeguards and security areas, so the ensuing analysis provided an inadequate basis that Departmental assets were protected at the required levels. Further, elements of the NNSA Management systems Assurance Program performance measures, used by NNSA to help influence decisions regarding contractor award fees, did not accurately depict actual contractor performance. Some delays can be attributed to NNSA management inappropriately applying the Assurance Program with the belief that they could not intervene to prompt the contractor**

to reduce maintenance backlogs. Collectively, weaknesses in contractor, site office, Defense Nuclear Security, and DOE oversight and assurance systems essentially blinded DOE and NNSA senior management to the overall health of the protection program at Y-12 and as to early indicators of problems that, if corrected, might have mitigated the security breach.

**Q2b. Was the withholding of information deliberate?**

**A2b. Actions, or lack thereof, taken by the contractor(s) stemmed from a lack of awareness of the seriousness and systemic nature of the issues. Weaknesses in contractor assurance systems and the overly broad delegation of authorities to and assumption of authority by the contractor exacerbated the poor flow of meaningful performance information to NNSA.**

**Q2c. Was the security budget recently reduced for Y12? Was the security program in deliberate reduction for cost or other reasons?**

**A2c. Yes. Y12 conducted vulnerability analyses using the draft graded security protection policy that proposed changes as a result of a new threat statement. Based on the analyses, NNSA and B&W identified several positions that could be reduced resulting in a decrease to the security budget beginning in FY13. Recent reviews have identified a pervasive perception on the part of site personnel that the overriding priority for security at Y-12 was to cut its costs, often to the detriment of prudent security strategies.**

**Q2d. Was the breakdown within the on-site federal management office?**

**A2d. There was a culture of harmonization and collaboration within DOE that included an overconfidence of actions being taken. Based on direction from the NNSA Defense Nuclear Security, the plan for reductions and operations of the Site were viewed as appropriate. Additionally, there were separate contracts direct to the Site office to include B&W Y12, the M&O contractor; G4S, the PF services contractor; and PSI, the personnel security contractor. This structure fostered a separation of duties and lack of a systems approach. Communications were fractured within the Y12 Site Office, between the federal and contractor personnel and the contractors themselves. As a result, the federal staff spent considerable time focusing on integration of the work processes rather than evaluation of the program as a whole.**

**QUESTION FROM REPRESENTATIVES LEE TERRY AND MICHAEL BURGESS**

- Q3. In the hearing, Mr. Poneman stated that the show cause letter, "...is the first step to our potentially terminating the contracts for both the site contractor and its security subcontractor."**
- a. What are the succeeding steps?**
  - b. If you do end up terminating them for cause, say like you did with the M&O contractor at Rocky Flats, would you consider this ample justification to make a sole source award to a new contractor?**
  - c. Describe your contingency plan for this possibility?**
- A3. B&W delivered its response to the show cause letter and it is being reviewed. If it is determined that a termination for cause is warranted, NNSA will notify B&W Y-12, LLC of the decision and a timeline for transition of operations to the successor contractor will be provided. Should NNSA determine that termination for cause is appropriate, the work at Y-12 can be transitioned to the successor contractor at any time after the date of contract award in accordance with the terms of the successor contract.**

**QUESTION FROM REPRESENTATIVES LEE TERRY AND MICHAEL BURGESS**

**Q4. You have elected, going ahead, to forbid the new M&O to subcontract security. Is your decision based on best practices, budget, or to improve security at Y12?**

**A4. The decision to require that security be performed by an M&O team member was made to ensure that NNSA will have direct line authority and communication with security management and personnel through the single prime contract. This approach may improve security by making it easier for NNSA staff to monitor security performance of its one prime contractor, to hold the contractor accountable and to more efficiently effectuate any changes in security that may become necessary in the future.**

**QUESTION FROM REPRESENTATIVES LEE TERRY AND MICHAEL BURGESS**

**Q5. You have chosen not to receive proposals that were due on 10 August for the new PF contract. Why? Would it have cost the government anything to look at these proposals for a new solution to the security mess at Y12?**

**A5. After revisiting its requirement, and in light of the incident at Y-12, NNSA determined that a single, integrated security posture is optimal for this Category 1, Special Nuclear Material protection and therefore, added protective force requirements to the solicitation for the management and operations of the Nuclear Production sites. Concurrently, the PF solicitation was amended to remove that same work. The government has a responsibility to notify offerors if a requirement is substantially changed or is no longer valid. Removing NNSA requirements from the PF solicitation is a substantial change, and therefore, an amendment to the solicitation was issued and communicated.**



**QUESTION FROM REPRESENTATIVES LEE TERRY AND MICHAEL BURGESS**

**Q6. Does NNSA have the civil service expertise to oversee the challenges of transition to a new security regimen and ensuring that the M&O contractor establishes and executes a more rigorous security program?**

**A6. There is limited federal civil service expertise to oversee security. The report on NNSA Organization and Oversight which resulted from the study led by Brigadier General Finan will provide more details on an assessment process for overseeing the implementation of the M&O contractor's safeguards and security program.**

**Q6a. Please provide the committee with a list of the Federal staff who will oversee the implementation of the new security program at Y-12 and Pantex, their present civil service position titles and GS / SES grades, and their duty station locations.**

**A6a. NNSA has provided this information as requested to the Committee staff.**



**Department of Energy**  
Washington, DC 20585

February 14, 2013

The Honorable Ron Wyden  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On September 12, 2012, Peter Lyons, Assistant Secretary for Nuclear Energy, testified regarding "S. 3469, the Nuclear Waste Administration Act of 2012."

Enclosed are the answers to 14 questions that were submitted by Senators Maria Cantwell and John Barrasso to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Brad Crowell", is written over the typed name.

Brad Crowell  
Principal Deputy Assistant Secretary  
Congressional & Intergovernmental Affairs

Enclosures

cc: The Honorable Lisa Murkowski, Ranking Member



## QUESTION FROM SENATOR CANTWELL

Q1A. Do you agree that nuclear waste that we would never want to retrieve but can be permanently disposed of should be treated differently?

A1A. The need for retrievability of waste from a repository is a regulatory safety requirement and is not based on whether the materials would have any potential future value.

Q1B. Have you studied whether permanent disposal in salt formations could be a cheaper and more readily available alternative to other geological storage options?

A1B. The DOE is evaluating the isolation performance, potential availability, and cost of various generic geologic disposal options, including the option of a geologic repository in salt. The cost of any disposal option must be considered in context of the total system and life-cycle costs, including costs for storage, handling, and transportation. Any cost estimates for generic disposal options are highly uncertain.

Q1C. How do we make sure that defense waste does not get lost in the nuclear waste debate this time around?

A1C. The DOE recognizes the need to consider defense waste as well as commercial used fuel as it develops a new strategy for the management and disposition of high-level radioactive waste.

## QUESTION FROM SENATOR CANTWELL

Q2A. Given the bleak prospects for recycling or otherwise using nuclear waste, should this retrievability requirement block siting a repository in a technically-sound, cost-effective place that is willing to accept waste?

A2A. The DOE does not believe that current legal and regulatory requirements related to the retrievability of waste from a geologic repository preclude the use of any geologic medium considered to date, including salt, to host a repository for spent nuclear fuel or high-level radioactive waste.

Safe, permanent isolation in accordance with regulatory requirements will remain the primary goal of geologic disposal.

Q2B. If the insistence on this retrievability requirement for commercial waste continues, do you think we ought to consider a separate repository for defense waste without such a restriction – a potential dual-path forward envisioned by the original Nuclear Waste Policy Act of 1982?

A2B. As indicated in the previous response, the DOE does not believe that current legal and regulatory requirements related to retrievability preclude the use of any of the media that have been considered for either commercial spent nuclear fuel or defense high-level wastes and DOE-managed spent fuel.

### QUESTION FROM SENATOR CANTWELL

- Q3A. Do you see the Blue Ribbon Commission recommendations and Chairman Bingaman's legislation as a renewed call to correct our course? Choosing science, economics, and consensus over the failed political wrangling of the past 25 years, going back to many of the principles of the original Nuclear Waste Policy Act of 1982?
- A3A. The Blue Ribbon Commission on America's Nuclear Future (BRC) worked through a public, open, and transparent process on recommendations to support a new strategy for the back end of the nuclear fuel cycle. The Administration appreciates their dedicated work in recommending a path forward. The BRC highlighted a need for changes in current law, and the Administration will work with Congress to define a responsible and achievable path forward to manage our nation's used nuclear fuel and nuclear waste.
- Q3B. For such a complex challenge as disposing of nuclear waste for millions of years, do you believe technical considerations should trump political ones to the maximum extent possible?
- A3B. Technical suitability is a necessary condition for the acceptability of any site, but should be accompanied by acceptance by the host communities. We believe that the consent-based approach to siting endorsed by the BRC is critical to success. The Administration supports working with Congress to develop a process that is transparent, adaptive, and technically sound.

### QUESTION FROM SENATOR CANTWELL

Q4A. Do you believe that cost should be an important factor when selecting among sites that can safely dispose of waste and have support within the community?

A4A. Yes, an important factor in selecting among sites that can all safely dispose of waste and have support within the community would be site-specific costs (including transportation, community benefits, and so on) and the full system level costs, including interim storage, handling, and transportation of the wastes.

Q4B. Do you agree that salt formations could deliver potential cost savings compared to other geologic media types and deserve consideration?

A4B. The DOE agrees that salt formations deserve consideration for geologic disposal.

### QUESTION FROM SENATOR CANTWELL

Q5A. Do the cost-effectiveness of meeting technical requirements and inherent suitability of a site go hand-in-hand?

A5A. Yes. In fact, the existing repository siting guidelines the DOE established pursuant to the Nuclear Waste Policy Act of 1982 stipulated that cost would be one of the explicit factors considered in determining the suitability of a site.

Q5B. Do you agree that cost-effectiveness is an important consideration that partially takes the suitability of a repository site into account?

A5B. Yes. The cost-effectiveness of a proposed action reflects not only the cost of the action, but also the ability of the proposed action to accomplish its objectives. Thus, any evaluation of a potential repository site for cost effectiveness will take into consideration the suitability of the site.

## QUESTION FROM SENATOR CANTWELL

Q6A. Are there any technical or safety reasons for the current limit of 70,000 tons? If so, does this mean that we need multiple repositories to accommodate all of our nation's waste?

A6A. The current 70,000 MTHM limit in the Nuclear Waste Policy Act on the capacity of the first repository until a second repository is in operation is not based on any technical considerations related to the characteristics of possible repository sites or geologic media. Since the inventories of commercial and Federal Government used fuel and HLW in the United States already exceed 70,000 MTHM, this statutory limit means the Nation would need a second repository for used fuel and HLW. Without such a limit, a single repository could be designed to accept its maximum safe capacity, and this maximum safe capacity might be sufficient to accommodate the used fuel and HLW that exists today in the United States and that will be generated based on realistic projections of the life expectancy of existing commercial nuclear power plants.

Q6B. Why do you think over half of our nation's high level defense waste was left out of the plan at Yucca?

A6B. President Reagan decided in 1985 that the Department should make arrangements to use the disposal capacity of repositories developed under the Nuclear Waste Policy Act for the disposal of defense HLW, including DOE and U.S. Navy used nuclear fuel. Because the NWPA limited the capacity of the first repository to 70,000 MTHM, the Department established a policy to allocate ninety percent (90%) of the first repository capacity (in MTHM) to civilian used fuel and ten percent (10%) of the repository capacity to Department-managed used fuel and HLW. Accordingly, 63,000 MTHM of the 70,000 MTHM statutory limit of Yucca Mountain was allocated to civilian waste and 7,000



MTHM of the 70,000 MTHM statutory limit was allocated to national defense waste. The remainder of the defense waste and the remainder of the civilian waste was planned to go to the second repository or to Yucca Mountain if the statutory limit was removed.

## QUESTION FROM SENATOR BARRASSO

Q1. S. 3469 would establish a new waste management agency. It would transfer to the agency the functions of the Secretary of Energy, relating to the siting, licensing, construction, and operation of nuclear management facilities. The Blue Ribbon Commission has called for the establishment of a new Federally chartered corporation to handle these responsibilities. (A.) Does the Administration support the creation of a new Federal agency to handle nuclear waste management? (B.) Does the Administration support the creation of a new Federally chartered corporation to handle nuclear waste management?

A1 As you note, the BRC recommended the establishment of a new, single-purpose organization charged with the management and disposal of high level waste and the associated interface with the waste generators. The Administration concurs that a new entity established to run the program will need to provide the stability, focus, and credibility required to build public confidence and ensure success. The Administration agrees that a new waste management and disposal organization could have advantages in terms of stability, focus, and other characteristics that will be important to future success. However, the organizational form is only one of the factors.

Any organizational model chosen for running the new nuclear waste management program will need to balance the critical attributes of accountability, transparent decision-making, a public interest mission, organizational stability, oversight, and public credibility. The Administration looks forward to working with Congress to design a governance structure that meets these objectives.

## QUESTION FROM SENATOR BARRASSO

Q2. In your testimony, you explain that nuclear waste fee collections exceed \$750 million each year. What benefits are rate payers currently receiving in return for these fees?

A2. Pursuant to the Nuclear Waste Policy Act, annual fees paid by utilities to the Nuclear Waste Fund are based on the electricity generated and sold each year by civilian power reactors, and are intended to fully offset the ultimate total life cycle costs to the Federal Government of management and disposal of nuclear wastes. The annual fees are not intended to offset only current expenditures from the Nuclear Waste Fund.

The President's fiscal year 2013 budget request included \$60 million to investigate priorities identified by the BRC and within existing authority, including:

- Laying the ground work for the potential implementation of consolidated interim storage by initiating design concepts for consolidated interim storage that build on previous DOE work and industry storage licensing efforts.
- Beginning work with transportation industry stakeholders to revisit the recommendations of the 2006 National Academy report on transportation of spent fuel and high level radioactive waste and preparing a report on plans to address these recommendations.
- Conducting R&D to better understand potential degradation mechanisms in long-term dry cask storage, and initiating work on standardized cask systems to enable storage, transportation, and disposal without repackaging of the used fuel.
- Conducting R&D on generic geological media, which will support efforts to prepare a detailed license application for any new site and new media.

### QUESTION FROM SENATOR BARRASSO

- Q3. The Blue Ribbon Commission issued its report on January of this year. I understand the Administration was supposed to submit a plan to implement the recommendations by the end of July, but has yet to do so. A. What is the reason for the delay? B. When can Congress expect the Administration's implementation plan?
- A3. The Blue Ribbon Commission on America's Nuclear Future (BRC) released its final report on January 26, 2012. The Commissioners worked collaboratively and constructively – through a public, open and transparent process – on recommendations to support a new strategy for the back end of the nuclear fuel cycle. Subsequently, the Administration has been undertaking a thorough review of the BRC report and recommendations. The Administration is still finalizing its framework for the management of nuclear waste and looks forward to working with Congress to define a responsible and achievable path forward to manage the nation's used nuclear fuel and nuclear waste.

### **QUESTION FROM SENATOR BARRASSO**

**Q4.** Does the Administration support S. 3469 as currently written? If not, do you recommend specific changes to the bill? If so, what are those changes?

**A4.** S. 3469, the Nuclear Waste Administration Act of 2012, is an important step in restarting the dialogue that will lead to the next generation of nuclear waste policy in the United States. We look forward to working closely with Congress to craft legislation that reflects a viable, program that addresses the needs of the country and the priorities of both the Administration and Congress.

### **QUESTION FROM SENATOR BARRASSO**

- Q5. The Consolidated Appropriations Act for FY2012 requires the Department of Energy (DOE) to submit to the House and Senate Appropriations Committees a revised excess uranium inventory management plan for FY 2013 through FY 2018 "[n]o later than June 30, 2012." DOE has yet to submit such a plan. A. When will DOE submit a plan? B. Do you expect the management plan to be consistent with the May 15, 2012 Secretarial Determination?
- A5. The Department anticipates submitting its updated excess uranium inventory management plan to Congress as soon as practicable and that the plan will be consistent with the Secretarial Determination of May 15, 2012.

## QUESTION FROM SENATOR BARRASSO

Q6. Section 312(a) of the Consolidated Appropriations Act for FY2012 reads as follows:

*Any determination (including a determination made prior to the date of enactment of this Act) by the Secretary pursuant to section 3122(d)(2)(B) of the USEC Privatization Act (110 Stat. 1321-335), as amended, that the sale or transfer of uranium will not have an adverse material impact on the domestic uranium mining, conversion, or enrichment industry shall be valid for not more than 2 calendar years subsequent to such determination. (emphasis added)*

Pursuant to the May 15, 2012 Secretarial Determination, DOE plans to transfer up to: (a) 2,400 metric tons of natural uranium per year between 2012 and 2021 to DOE contractors for cleanup services at the Paducah or Portsmouth gaseous diffusion plants; and (b) 400 metric tons of natural uranium equivalent per year contained in low-enriched uranium (LEU) to National Nuclear Security Administration contractors for down-blending highly enriched uranium to LEU from 2012 through 2020. Are provisions 2) and 3) of the May 15, 2012 Secretarial Determination permissible under the two year limitation set forth in section 312(a)? If so, how?

A6. The May 2012 Determination addresses the market impact of transferring specific quantities and types of DOE's excess uranium inventories through 2021. Under Section 312(a) of the Consolidated Appropriations Act, 2012, determinations by the Secretary pursuant to Section 3112(d)(2)(B) of the USEC Privatization Act remain valid for only two calendar years from the date of issuance. Thus, the Department anticipates revisiting the potential market impact for transfers of uranium covered under Section 3112(d)(2)(B) of the USEC Privatization Act every two years, so long as it seeks to continue the covered transfers.

## QUESTION FROM SENATOR BARRASSO

Q7. On February 16, 2012, Secretary Chu testified before this Committee that:

*We have to be very careful about...bartering [uranium] will affect the markets...if we introduce into the market...10 percent [of domestic fuel requirements] or below...we feel safe that it won't have a material impact on the markets.*

If fully implemented, the May 15, 2012 Secretarial Determination would result in uranium transfers that exceed the 10 percent cap set forth in the DOE's 2008 Excess Uranium Inventory Management Plan. A. Does DOE believe that the market for uranium changed from February to May to justify exceeding the 10 percent cap? B. If so, what changes in the market for uranium between the February hearing and the May 15, 2012 Secretarial Determination? Please be specific.

A7. The Department undertook an analysis to determine the impact of proposed uranium transactions prior to the May 2012 Secretarial Determination. This analysis concluded that the transactions would not have an adverse material impact on the domestic uranium mining, conversion, or enrichment industries.



## **QUESTION FROM SENATOR BARRASSO**

- Q8. How would DOE respond to changes in the global market for uranium to ensure that the sales and transfers envisioned under the May 15, 2012 Secretarial Determination do not have an adverse material impact on the America's uranium mining, conversion, or enrichment industry?
- A8. As presented in Answer 6, pursuant to Section 312(a) of the Consolidated Appropriations Act, 2012, the Department anticipates revisiting the potential market impact for transfers of uranium covered under Section 3112(d)(2)(B) of the USEC Privatization Act every two years, so long as it seeks to continue the covered transfers.



## Department of Energy

Washington, DC 20585

February 15, 2013

The Honorable Tim Murphy  
Chairman  
Subcommittee on Oversight and Investigations  
Committee on Energy and Commerce  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On September 12, 2012, Daniel B. Poneman, Deputy Secretary, testified regarding the "DOE's Nuclear Weapon's Complex: Challenges to Safety, Security, and Taxpayer Stewardship."

Enclosed are the answers to 10 questions that were submitted to Thomas P. D'Agostino by former Chairman Cliff Stearns, and Representatives Lee Terry and Michael C. Burgess to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis".

Christopher E. Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures



## QUESTION FROM REPRESENTATIVE CLIFF STEARNS

**Q1. As Administrator of NNSA, do you have the autonomy needed to effectively and efficiently manage and lead the nuclear weapons enterprise?**

**A1. Yes, NNSA was established as a semi-autonomous agency. I have the necessary autonomy to effectively and efficiently manage and lead the NNSA.**

- **Our objective is to deliver on missions safely and securely across the complex. Safety and security are embedded in the execution of our job and in our culture. It is not a trade-off of safety vs. mission.**
- **Oversight is not overlapping or duplicative; the line and independent efforts are complementary.**
- **There is a process within Department of Energy (DOE) to resolve differences in views between Office of Health, Safety and Security (HSS) and NNSA, the Secretary makes the final decision.**

**Q1a. If not, what authorities do you need to carry out your mission?**

**N/A**

## QUESTION FROM REPRESENTATIVE CLIFF STEARNS

- Q2. NNSA has a history of management challenges in the area of safety and security, and NNSA sites continue to experience performance deficiencies.**
- a. Do you believe the NNSA needs its own authority to set new and different nuclear safety requirements and standards from DOE's standards?**
  - b. If so, would you please elaborate?**
- A2. Under existing statutory authorities, NNSA already has the authority to set policy (which includes requirements) subject to the disapproval of the Secretary (i.e., only the Secretary could overrule an NNSA-issued policy). NNSA also is fully engaged in the DOE directives system. Under that system, NNSA provides input to and in some cases authors DOE directives that are applicable to NNSA and, in some cases, other DOE organizations. Under the DOE Directives system, a provision exists for NNSA and other DOE elements to write supplemental directives, so long as they do not conflict with DOE directives. Also, the Directives system provides NNSA (at the Secretarial Officer level) with unilateral authority to write exemptions to DOE directives and DOE regulations where necessary to address NNSA issues. Through the existing directives system provisions, NNSA has the ability to non-concur on new or revised requirements, if needed, to elevate issues to the Secretary. NNSA uses all of these tools effectively to ensure that NNSA's needs are met by the DOE directives and regulations. While there may be disagreements during the development and revision of requirements the exchange generally results in a synergy that produces superior products than would exist without the full engagement of NNSA and its partners in the broader DOE. In addition, NNSA has the authority to establish requirements independently from DOE, and has exercised that authority.**

### QUESTION FROM REPRESENTATIVE CLIFF STEARNS

- Q3. What role does the Secretary's Office of Health, Safety and Security (HSS) play in assisting the NNSA achieve its mission?**
- A3. NNSA is structured to function as a semi-autonomous agency and is uniquely responsible and accountable to achieve its mission. The inherently federal health, safety and security functions that NNSA requires to execute its vital national security mission reside in NNSA. Beyond NNSA's own capabilities, NNSA and the Secretary benefit from the enhanced capabilities that HSS provides in supporting NNSA. These capabilities include three discrete functions. First, HSS, in collaboration with Central Technical Authorities and line management, is responsible for the development of Department of Energy (DOE) nuclear safety policy, Federal Rules, Orders, and the associated standards and guidance, as well as for reviewing safety issues complex-wide. The second HSS function is to develop and assist in the implementation of safeguards and security programs and policies that provide protection to national security and other vital national assets entrusted to DOE. The third function is to conduct independent oversight that is independent from line management and to provide support in administering regulatory enforcement of NNSA contractors. The manifestations of these three HSS functions are as follows: (1) HSS independently and regularly evaluates contractor and Federal safety and security performance and recommends needed improvements. (2) HSS conducts enforcement investigations in the areas of nuclear safety, worker safety and information security, for contractor violations of Departmental regulations in those areas and makes recommendations on enforcement actions to the NNSA Administrator for action. The independence of HSS, which reports directly to the Office of the Secretary, affords HSS the autonomy to exercise its oversight role without potential conflicts of interest**

with those line managers who are subject to its oversight. In summary, the HSS functions and their manifestations collectively support NNSA in executing its mission in a more effective manner and provide a venue for coordinating health, safety and security matters across the DOE in consistent ways.

#### **QUESTION FROM REPRESENTATIVE CLIFF STEARNS**

**Q4. Do you believe available evidence supports removing the Secretary's independent oversight from either NNSA or its contractors?**

**A4. No. Both Line and Independent oversight have been instrumental in identifying issues that could have adversely impacted the NNSA mission such as cost or schedule overruns of major projects. NNSA accomplishes our work through a supporting partnership with our Contractors for mission success. A critical element of the partnership is the ability of our Contractors to manage innovatively and deliver program results in a safe, secure, efficient, compliant and ethical manner. We continue to improve upon performance-based oversight by using a graded approach consistent with associated risks and our Contractor's demonstrated performance. However, not only does the NNSA maintain our Federal responsibility to exercise oversight to sustain a strong self-regulatory posture we also rely on the Department's independent oversight of our NNSA projects and programs to provide an unbiased opinion and a validation of the quality of our Line oversight process. As a learning organization, we incorporate lessons learned from both internal and independent oversight reports into our processes to promote continuous improvement in the management of our activities as we balance requirements, risks and resources.**

**Q4a. Can you provide examples of independent oversight impeding NNSA's mission, including delays and cost-overruns in major NNSA construction projects?**

**A4a. There are no examples.**

**Q4b. In any such examples, were the oversight finding invalid?**

**A4b. There are no examples.**

**QUESTION FROM REPRESENTATIVES LEE TERRY AND MICHAEL BURGESS**

**B&W Response**

**Q1. Please share with the committee a copy of the B&E response to the show cause letter.**

**A1. Copy of the response was provided to the Committee.**



**QUESTION FROM REPRESENTATIVES LEE TERRY AND MICHAEL BURGESS**

**Q2. The show cause letter did not raise the issue of whether or not B&W and G4S fulfilled their responsibilities to keep NNSA informed of issues. Did they?**

**A2. No, they did not. B&W and G4S are required by contract and Departmental directives to implement effective contractor assurance systems and performance assurance programs to measure the effectiveness of their security program. Those programs are intended to promote continuous improvement, but also to inform and assure NNSA. However, self-assessments conducted by B&W and G4S often contained insufficient information regarding security program implementation, failed to identify issues, or lacked analyses to support the conclusions. Consequently, the contractors' reports did not accurately inform NNSA about the effectiveness of existing security programs to support management decisions regarding future security activities.**

**Q2a. Why did it take so long for security system vulnerabilities to become known outside the contractor community?**

**A2a. In addition to the weaknesses in contractor assurance systems, numerous examples of inadequate Federal oversight were evident. Oversight and assessment activities by the former Y-12 Site Office did not effectively evaluate all safeguards and security areas, so the ensuing analysis provided an inadequate basis that Departmental assets were protected at the required levels. Further, elements of the NNSA Management systems Assurance Program performance measures, used by NNSA to help influence decisions regarding contractor award fees, did not accurately depict actual contractor performance. Some delays can be attributed to NNSA management inappropriately applying the Assurance Program with the belief that they could not intervene to prompt the contractor**

to reduce maintenance backlogs. Collectively, weaknesses in contractor, site office, Defense Nuclear Security, and DOE oversight and assurance systems essentially blinded DOE and NNSA senior management to the overall health of the protection program at Y-12 and as to early indicators of problems that, if corrected, might have mitigated the security breach.

**Q2b. Was the withholding of information deliberate?**

**A2b. Actions, or lack thereof, taken by the contractor(s) stemmed from a lack of awareness of the seriousness and systemic nature of the issues. Weaknesses in contractor assurance systems and the overly broad delegation of authorities to and assumption of authority by the contractor exacerbated the poor flow of meaningful performance information to NNSA.**

**Q2c. Was the security budget recently reduced for Y12? Was the security program in deliberate reduction for cost or other reasons?**

**A2c. Yes. Y12 conducted vulnerability analyses using the draft graded security protection policy that proposed changes as a result of a new threat statement. Based on the analyses, NNSA and B&W identified several positions that could be reduced resulting in a decrease to the security budget beginning in FY13. Recent reviews have identified a pervasive perception on the part of site personnel that the overriding priority for security at Y-12 was to cut its costs, often to the detriment of prudent security strategies.**

**Q2d. Was the breakdown within the on-site federal management office?**

**A2d. There was a culture of harmonization and collaboration within DOE that included an overconfidence of actions being taken. Based on direction from the NNSA Defense Nuclear Security, the plan for reductions and operations of the Site were viewed as appropriate. Additionally, there were separate contracts direct to the Site office to include B&W Y12, the M&O contractor; G4S, the PF services contractor; and PSI, the personnel security contractor. This structure fostered a separation of duties and lack of a systems approach. Communications were fractured within the Y12 Site Office, between the federal and contractor personnel and the contractors themselves. As a result, the federal staff spent considerable time focusing on integration of the work processes rather than evaluation of the program as a whole.**

**QUESTION FROM REPRESENTATIVES LEE TERRY AND MICHAEL BURGESS**

- Q3. In the hearing, Mr. Poneman stated that the show cause letter, "...is the first step to our potentially terminating the contracts for both the site contractor and its security subcontractor."**
- a. What are the succeeding steps?**
  - b. If you do end up terminating them for cause, say like you did with the M&O contractor at Rocky Flats, would you consider this ample justification to make a sole source award to a new contractor?**
  - c. Describe your contingency plan for this possibility?**
- A3. B&W delivered its response to the show cause letter and it is being reviewed. If it is determined that a termination for cause is warranted, NNSA will notify B&W Y-12, LLC of the decision and a timeline for transition of operations to the successor contractor will be provided. Should NNSA determine that termination for cause is appropriate, the work at Y-12 can be transitioned to the successor contractor at any time after the date of contract award in accordance with the terms of the successor contract.**

**QUESTION FROM REPRESENTATIVES LEE TERRY AND MICHAEL BURGESS**

**Q4. You have elected, going ahead, to forbid the new M&O to subcontract security. Is your decision based on best practices, budget, or to improve security at Y12?**

**A4. The decision to require that security be performed by an M&O team member was made**

**to ensure that NNSA will have direct line authority and communication with security**

**management and personnel through the single prime contract. This approach may**

**improve security by making it easier for NNSA staff to monitor security performance of**

**its one prime contractor, to hold the contractor accountable and to more efficiently**

**effectuate any changes in security that may become necessary in the future.**

**QUESTION FROM REPRESENTATIVES LEE TERRY AND MICHAEL BURGESS**

**Q5. You have chosen not to receive proposals that were due on 10 August for the new PF contract. Why? Would it have cost the government anything to look at these proposals for a new solution to the security mess at Y12?**

**A5. After revisiting its requirement, and in light of the incident at Y-12, NNSA determined that a single, integrated security posture is optimal for this Category 1, Special Nuclear Material protection and therefore, added protective force requirements to the solicitation for the management and operations of the Nuclear Production sites. Concurrently, the PF solicitation was amended to remove that same work. The government has a responsibility to notify offerors if a requirement is substantially changed or is no longer valid. Removing NNSA requirements from the PF solicitation is a substantial change, and therefore, an amendment to the solicitation was issued and communicated.**

**QUESTION FROM REPRESENTATIVES LEE TERRY AND MICHAEL BURGESS**

**Q6. Does NNSA have the civil service expertise to oversee the challenges of transition to a new security regimen and ensuring that the M&O contractor establishes and executes a more rigorous security program?**

**A6. There is limited federal civil service expertise to oversee security. The report on NNSA Organization and Oversight which resulted from the study led by Brigadier General Finan will provide more details on an assessment process for overseeing the implementation of the M&O contractor's safeguards and security program.**

**Q6a. Please provide the committee with a list of the Federal staff who will oversee the implementation of the new security program at Y-12 and Pantex, their present civil service position titles and GS / SES grades, and their duty station locations.**

**A6a. NNSA has provided this information as requested to the Committee staff.**



## Department of Energy

Washington, DC 20585

February 21 , 2013

The Honorable Mike D. Rogers  
Chairman  
Subcommittee on Strategic Forces  
Committee on Armed Services  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On September 13, 2012, Daniel B. Poneman, Deputy Secretary, testified regarding the "Y-12 Intrusion: Investigation, Response, and Accountability."

Enclosed are the answers to 10 questions that were submitted by Representative Loretta Sanchez, and addressed to Deputy Secretary Daniel B. Poneman and Ms. Neile L. Miller to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher E. Davis".

Christopher E. Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Jim Cooper, Ranking Member





**QUESTION FROM REPRESENTATIVE LORETTA SANCHEZ**

**Q1. NNSA knew about the alarm rate, the broken cameras, and the over-reliance on compensatory measures.**

**A1. NNSA did not know all the details of the situation. Please see answers below.**

**Q1a. Why did site officials not intervene to fix these failures in a timely manner?**

**A1a. Site officials did not intervene because they lacked perspective on the impact that broken PIDAS cameras and an excessive number of compensatory measures would have on overall system effectiveness. They were involved in neither setting maintenance priority for the PIDAS cameras nor the approval of compensatory measures because local implementation of the NNSA directives in effect at the time placed those decisions with the contractor.**

**Q1b. Why were compensatory measures allowed to become in effective an indefinite solution?**

**A1b. From the contractor's perspective, compensatory measures were often less expensive and the incentive to repair was not sufficiently high to require immediate action. From a site office perspective, the contractor was viewed as following a process in line with NNSA policy and expectation. At the same time, the site vulnerability analysis team was used to assign case specific compensatory measures and did not look at the broader implications of individual decisions.**

**QUESTION FROM REPRESENTATIVE LORETTA SANCHEZ**

**Q2. In the past few years, NNSA issued security directives (NAPs) that replace DOE directives. The NAPs were intended to allow more flexibility in implementing security requirements and reduce the costs of security; they provided less rigorous requirements in certain areas such as maintenance of alarm systems and gave more authority to lower level managers to accept risks. Meanwhile, NNSA has favored a system with less independent oversight and instead relied more on the contractor self-assessments and the contractors' ability to establish effective safety and security programs and manage risk.**

**Our House NDAA bill also gives more authority to NNSA, blocking independent on safety and security. We heard from several laboratory directors about burdensome regulations and excessive oversight were hindering productivity at the laboratories.**

- Is it your view that NNSA sites conduct effective oversight?**
- Do contractors have too little independent oversight, or too much?**
- Do you believe that the incident is the result of overly burdensome security requirements, as some have claimed?**
- Do you think that NNSA has gone too far in delegating responsibility for making security decisions to its contractors?**
- In light of the Y-12 incident, are you concerned that new NAPs may be inconsistent or have fewer requirements than DOE regulations? Will you direct NNSA to rescind these NAPs or allow them to go forward?**
- Should independent oversight be strengthened?**

**Q2(a). Is it your view that NNSA sites conduct effective oversight?**

**A2(a). The Y-12 incident and subsequent Office of Health, Safety and Security (HSS)**

**Independent Oversight inspection identified numerous examples of inadequate federal oversight by line management and ineffective contractor assurance systems. For example, we learned that NNSA federal oversight and assessment activities did not effectively evaluate all safeguards and security areas, and the ensuing analyses did not provide an adequate basis to conclude that Departmental assets were being protected at the required levels. We also learned that NNSA performance measures (used to help**

influence decisions regarding contractor award fees) did not accurately depict actual contractor performance. Self-assessments conducted by both site contractors generally provided more information about the status of processes than of the actual effectiveness of security measures that were in place “on the ground.”

Contractor self-assessment reports often contained insufficient information regarding security program implementation, failed to identify deficiencies, or lacked the analyses to support conclusions. Consequently, reports did not accurately inform NNSA and contractor line management of the effectiveness of existing security programs to support decisions regarding future security activities. Weaknesses in contractor, site office, and NNSA Headquarters Defense Nuclear Security oversight and assurance systems essentially presented NNSA senior management with an inaccurate picture of the overall health of the protection program at Y -12, thereby missing the opportunity to identify early indicators of problems that might have mitigated the security breach.

While these deficiencies were especially pronounced at Y-12, HSS Independent Oversight reviews at other sites have also concluded that contractor assurance systems have not sufficiently matured and that weaknesses persist in NNSA federal line management oversight.

**Q2(b). Do contractors have too little independent oversight, or too much?**

A2(b). We believe that rigorous, performance-based, independent oversight is a critical element of DOE’s approach to self-regulation, particularly for high consequence facilities and activities such as nuclear operations and nuclear security. The government remains responsible for these facilities and for the potentially dramatic adverse consequences of failures in nuclear safety and nuclear security, and the government provides our

contractors billions of dollars of indemnification for nuclear accidents. Consequently, we have an obligation to ensure that those contractors are operating these facilities safely and securely. While DOE (including NNSA) line management has the primary responsibility for managing and overseeing contractor performance, our HSS Independent Oversight office has no responsibility for the mission and activities being reviewed. Consequently, HSS is able to provide the Secretary and me, along with line management, objective and unbiased feedback on performance. We believe that our contractors currently receive an appropriate level of independent oversight.

**Q2(c). Do you believe that the incident is the result of overly burdensome security requirements, as some have claimed?**

A2(c). No, the Y-12 incident was not at all the result of overly burdensome security requirements. Over the period of 2009-2010, the Department went through a systematic review to reform all of its safety and security directives. The outcome of that effort was the development of a more concise set of non-duplicative requirements and directives that produce effective protection and efficient operations. Our safety and security regulations and directives identify the necessary requirements to protect workers, the public, the environment, and national security assets. They also provide contractors the flexibility to meet the requirements in the most efficient manner, and are streamlined through consolidation or elimination of duplicative or unnecessary provisions.

**Q2(d). Do you think that NNSA has gone too far in delegating responsibility for making security decisions to its contractors?**

A2(d). The Y-12 incident was partly the result of overly broad delegation of inherently governmental risk acceptance authority to the contractor, which was made without effective Federal review. This inappropriate delegation of responsibility to the contractor

was enabled by inappropriate and/or ambiguous provisions in NNSA Policy documents (NAPs). At Y-12, the contractor “cognizant security authority” appeared to be unconstrained, with Federal officials deferring to the contractor for most decisions impacting the site security mission.

**Q2(e). In light of the Y-12 incident, are you concerned that new NAPs may be inconsistent or have fewer requirements than DOE regulations? Will you direct NNSA to rescind these NAP's or allow them to go forward?**

**A2(e).** A number of concerns were identified with security NAPs. In some cases, they provided a less rigorous standard of protection than Departmental directives or were not consistent with government-wide security requirements. In other cases, they provide for an inappropriate degree of delegation of risk acceptance authority to contractors. The Secretary and I believe, and the NNSA Administrator agrees, that there should be a single set of DOE security directives governing all Departmental operations, including those of the NNSA. The Administrator will rescind the security NAPs so that they will no longer be applied as a substitute for Departmental requirements. A revised version of NAPs may be utilized to provide additional implementing instructions, consistent with Departmental directives, to NNSA sites.

**Q2(f). Should independent oversight be strengthened?**

**A2(f).** Yes. The Secretary has re-emphasized the importance of HSS Independent Oversight as a critical element of the Department’s governance approach, and past GAO reviews have pointed to the importance of and need to strengthen independent oversight. The Secretary has also directed HSS Independent Oversight to undertake more rigorous inspections, to include force-on-force performance testing of the protection of special nuclear material at all Category I sites over a 12 month period. For many years, HSS

Independent Oversight has implemented a rigorous force-on-force performance testing program that has been regarded by the U.S. Nuclear Command and Control System staff as a model for federal agencies with nuclear security missions. The Secretary has also directed HSS Independent Oversight to further enhance that program by expanding the scope and variety of performance testing methods utilized to assess the readiness of DOE/NNSA site protection systems against a broader spectrum of threats and adversary capabilities. Performance testing methodologies will include no-notice and limited-notice testing to obtain a more realistic assessment of site response capabilities.

QUESTION FROM REPRESENTATIVE LORETTA SANCHEZ

- Q3. In the past few years, NNSA issued security directives (NAPs) that replace DOE directives. The NAPs were intended to allow more flexibility in implementing security requirements and reduce the costs of security; they provided less rigorous requirements in certain areas such as maintenance of alarm systems and gave more authority to lower level managers to accept risks. Meanwhile, NNSA has favored a system with less independent oversight and instead relied more on the contractor self-assessments and the contractors' ability to establish effective safety and security programs and manage risk.**

**Our House NDAA bill also gives more authority to NNSA, blocking independent on safety and security. We heard from several laboratory directors about burdensome regulations and excessive oversight were hindering productivity at the laboratories.**

- Is it your view that NNSA sites conduct effective oversight?**
- Do contractors have too little independent oversight, or too much?**
- Do you believe that the incident is the result of overly burdensome security requirements, as some have claimed?**
- Do you think that NNSA has gone too far in delegating responsibility for making security decisions to its contractors?**
- In light of the Y-12 incident, are you concerned that new NAPs may be inconsistent or have fewer requirements than DOE regulations? Will you direct NNSA to rescind these NAPs or allow them to go forward?**
- Should independent oversight be strengthened?**

**Q3(a). Is it your view that NNSA sites conduct effective oversight?**

**A3(a). The Y-12 incident and subsequent Office of Health, Safety and Security (HSS)**

**Independent Oversight inspection identified numerous examples of inadequate federal oversight by line management and ineffective contractor assurance systems. For example, we learned that NNSA federal oversight and assessment activities did not effectively evaluate all safeguards and security areas, and the ensuing analyses did not provide an adequate basis to conclude that Departmental assets were being protected at the required levels. We also learned that NNSA performance measures (used to help**

influence decisions regarding contractor award fees) did not accurately depict actual contractor performance. Self-assessments conducted by both site contractors generally provided more information about the status of processes than of the actual effectiveness of security measures that were in place “on the ground.”

Contractor self-assessment reports often contained insufficient information regarding security program implementation, failed to identify deficiencies, or lacked the analyses to support conclusions. Consequently, reports did not accurately inform NNSA and contractor line management of the effectiveness of existing security programs to support decisions regarding future security activities. Weaknesses in contractor, site office, and NNSA Headquarters Defense Nuclear Security oversight and assurance systems essentially presented NNSA senior management with an inaccurate picture of the overall health of the protection program at Y -12, thereby missing the opportunity to identify early indicators of problems that might have mitigated the security breach.

While these deficiencies were especially pronounced at Y-12, HSS Independent Oversight reviews at other sites have also concluded that contractor assurance systems have not sufficiently matured and that weaknesses persist in NNSA federal line management oversight.

**Q3(b). Do contractors have too little independent oversight, or too much?**

**A3(b).** We believe that rigorous, performance-based, independent oversight is a critical element of DOE’s approach to self-regulation, particularly for high consequence facilities and activities such as nuclear operations and nuclear security. The government remains responsible for these facilities and for the potentially dramatic adverse consequences of failures in nuclear safety and nuclear security, and the government provides our



contractors billions of dollars of indemnification for nuclear accidents. Consequently, we have an obligation to ensure that those contractors are operating these facilities safely and securely. While DOE (including NNSA) line management has the primary responsibility for managing and overseeing contractor performance, our HSS Independent Oversight office has no responsibility for the mission and activities being reviewed. Consequently, HSS is able to provide the Secretary and me, along with line management, objective and unbiased feedback on performance. We believe that our contractors currently receive an appropriate level of independent oversight.

**Q3(c). Do you believe that the incident is the result of overly burdensome security requirements, as some have claimed?**

A3(c). No, the Y-12 incident was not at all the result of overly burdensome security requirements. Over the period of 2009-2010, the Department went through a systematic review to reform all of its safety and security directives. The outcome of that effort was the development of a more concise set of non-duplicative requirements and directives that produce effective protection and efficient operations. Our safety and security regulations and directives identify the necessary requirements to protect workers, the public, the environment, and national security assets. They also provide contractors the flexibility to meet the requirements in the most efficient manner, and are streamlined through consolidation or elimination of duplicative or unnecessary provisions.

**Q3(d). Do you think that NNSA has gone too far in delegating responsibility for making security decisions to its contractors?**

A3(d). The Y-12 incident was partly the result of overly broad delegation of inherently governmental risk acceptance authority to the contractor, which was made without effective Federal review. This inappropriate delegation of responsibility to the contractor

was enabled by inappropriate and/or ambiguous provisions in NNSA Policy documents (NAPs). At Y-12, the contractor “cognizant security authority” appeared to be unconstrained, with Federal officials deferring to the contractor for most decisions impacting the site security mission.

**Q3(e). In light of the Y-12 incident, are you concerned that new NAPs may be inconsistent or have fewer requirements than DOE regulations? Will you direct NNSA to rescind these NAP's or allow them to go forward?**

**A3(e).** A number of concerns were identified with security NAPs. In some cases, they provided a less rigorous standard of protection than Departmental directives or were not consistent with government-wide security requirements. In other cases, they provide for an inappropriate degree of delegation of risk acceptance authority to contractors. The Secretary and I believe, and the NNSA Administrator agrees, that there should be a single set of DOE security directives governing all Departmental operations, including those of the NNSA. The Administrator will rescind the security NAPs so that they will no longer be applied as a substitute for Departmental requirements. A revised version of NAPs may be utilized to provide additional implementing instructions, consistent with Departmental directives, to NNSA sites.

**Q3(f). Should independent oversight be strengthened?**

**A3(f).** Yes. The Secretary has re-emphasized the importance of HSS Independent Oversight as a critical element of the Department’s governance approach, and past GAO reviews have pointed to the importance of and need to strengthen independent oversight. The Secretary has also directed HSS Independent Oversight to undertake more rigorous inspections, to include force-on-force performance testing of the protection of special nuclear material at all Category I sites over a 12 month period. For many years, HSS

Independent Oversight has implemented a rigorous force-on-force performance testing program that has been regarded by the U.S. Nuclear Command and Control System staff as a model for federal agencies with nuclear security missions. The Secretary has also directed HSS Independent Oversight to further enhance that program by expanding the scope and variety of performance testing methods utilized to assess the readiness of DOE/NNSA site protection systems against a broader spectrum of threats and adversary capabilities. Performance testing methodologies will include no-notice and limited-notice testing to obtain a more realistic assessment of site response capabilities.

QUESTION FROM REPRESENTATIVE LORETTA SANCHEZ

**Q4. NNSA announced a return to incorporating security operations within one prime contract that would also cover operations.**

- **Please provide a copy of the analysis that preceded this decision.**

The decision to assign the WSI contract under B&W at Y-12 until the new contract is awarded was made to promptly address issues at the site.

- **How will the change to the contracting structure fix these problems? What risks, challenges or uncertainties does it create?**

The change in contract structure will ensure full integration of all aspects of the safeguards and security program under a single management structure. The July 28, 2012, security breach at Y-12 exposed weaknesses in integrating critical security functions where the separate incumbent contractors shared responsibilities for the overall safeguards and security program.

- **Will the prime be allowed to sub-contract security operations? Why not?**

The prime contractor will not be allowed to sub-contract security operations in the combined Y-12/Pantex contract. This restriction was made to ensure that NNSA has direct oversight of the entire breadth of Security operations

- **How will the new contracting structure allow for strengthened federal oversight over security operations?**

Consolidating security work with plant operations will facilitate more streamlined and focused federal oversight by eliminating the need for the government to manage multiple contracts that require integrated activities at one site.

- **Will NNSA/DOE be able to have access to the security contractor?**

Yes, the decision to preclude subcontracting Security operations was done to ensure that NNSA has direct access to the entire breadth of Security operations.

- **Are there any expected cost savings? How much?**

Previous NNSA analysis has indicated that enveloping security services within the M&O contract will likely result in increased costs to the government; however, the potential risks associated with a diversified contractual approach in the current Y-12 environment required an immediate remedy.

**QUESTION FROM REPRESENTATIVE LORETTA SANCHEZ**

**Q5. As GAO asked, why does HSS not have the power to enforce its own recommendations?**

**A5. The role of the HSS Independent Oversight office is to conduct appraisals to evaluate the performance of DOE line organizations and contractors, and to identify deficiencies where they are detected. HSS Independent Oversight may also provide recommendations to DOE line management on approaches to addressing the deficiencies. DOE line management and its contractors are required by Departmental directive to evaluate deficiencies identified by HSS Independent Oversight, including identifying the reasons for the deficiencies, and to develop and implement corrective actions plans for problems identified as “significant deficiencies”. Our DOE field offices and contractors are accountable to the head of their respective program offices, such as the NNSA Administrator, and ultimately to the Secretary and me for ensuring that problems are adequately and promptly addressed. HSS Independent Oversight has the authority to monitor implementation of those corrective measures and to report back to senior program office officials and to me if there are any concerns as to responsiveness or effectiveness of actions. This arrangement appropriately places the responsibility and accountability for corrective actions with DOE line management, with HSS Independent Oversight serving to monitor the effectiveness of actions on behalf of the Secretary and Deputy Secretary.**

QUESTION FROM REPRESENTATIVE LORETTA SANCHEZ

**Q6. Please provide any report or analysis that Department of Energy/NNSA may produce on whether security should be transferred to the Department of Defense, including costs, legal issues, and whether the deficiencies that led to the failures would/could be avoided if security was shifted to the military?**

**A6. NNSA has not produced any report or analysis regarding the subject of transferring responsibility for security to the Department of Defense. This effort would require collaboration between both organizations to properly address and respond appropriately to the question.**

QUESTION FROM REPRESENTATIVE LORETTA SANCHEZ

- Q7. Please provide any report or analysis that Department of Energy/NNSA may produce on whether security should be transferred to the Department of Defense, including costs, legal issues, and whether the deficiencies that led to the failures would/could be avoided if security was shifted to the military?**
- A7. The Department of Energy (including the NNSA) has not produced any report or analysis on the subject of transferring responsibility for security to the Department of Defense.**



**QUESTION FROM REPRESENTATIVE LORETTA SANCHEZ**

**Q8. How would the House National Defense Authorization provisions impact federal oversight of security operations? What are the benefits and risks of these provisions? Please provide your views on these provisions.**

**A8. The Administration strongly opposes sections 3202, 3115, 3113, and 3151. These provisions severely hamper external, independent oversight by the Defense Nuclear Facilities Safety Board; move regulatory authority from independent offices and agencies to the NNSA Administrator; require a weaker standard of contractor governance, management, and oversight; and eliminate DOE's flexibility to determine the appropriate means of assessing the unique risks that it confronts in its facilities. By lowering safety standards for the nuclear weapons complex and reducing requested funding for health, safety, and security, these provisions would weaken protections for workers and the general public.**

Sections 3113 would excessively restrict the authority of the Secretary of Energy to oversee the management and operations of the NNSA. This section would restrict the Secretary's ability to select the most appropriate oversight mechanism for its contractors.

The term "performance-based standards" is referenced under section 3113, states with respect to a covered contract, means that contract includes the use of performance work statements that set forth contract requirements in clear, specific, and objective terms with measureable outcomes. The definition listed in section 3113, does not accurately reflect the NNSA performance-based approach, which is being implemented to include a comprehensive and detailed method with performance testing evaluation of specific security operations and activities to determine security program effectiveness.

Additionally, NNSA must retain the ability to select the best oversight mechanism given its high security hazard/consequence activities, such as operation of nuclear facilities and protection of special nuclear materials. The fact that the NNSA's mandate is to provide adequate protection for its workers and assets while managing unique hazards as it conducts high-consequence activities (e.g., nuclear security) makes it particularly important that the NNSA retain the ability to use all necessary tools to fulfill its mission. The proposed bill limits our ability to determine how best to execute the NNSA's mission securely and effectively.

Within the NNSA, we recognize a need for a Headquarters security assessment element between the site level and the independent oversight provided by the Office of Health, Safety, and Security. NNSA is establishing a Performance Assessment Division within the Office of Defense Nuclear Security for security assessment of contractors and Federal field organization performance, including no-notice and/or short notice evaluations. The division will also assess training effectiveness, policy implementation, and the proper execution of vulnerability assessments. This entity will be used to verify that security programs are properly implemented and provide a nuclear security enterprise viewpoint to NNSA senior leadership.

Section 3115 would mandate that the NNSA alone establish and oversee health, safety, and security at its facilities, which would deprive NNSA of an essential function provided by the HSS Office of Independent Oversight. The Office of Independent Oversight is an important independent element, which assists in the inspection process of our facilities and assets. The provision would hamper existing function to enforce and ensure accountability for meeting security requirements. Similarly, the bill would restrict the

NNSA's ability to prescribe health and security regulations regarding non-nuclear activities that are more stringent than Occupational Safety and Health Administration standards by requiring waivers to permit use of more stringent standards. We believe that the NNSA must be able to prescribe a regime that meets its unique needs without having to use waivers.

QUESTION FROM REPRESENTATIVE LORETTA SANCHEZ

- Q9. How would the House National Defense Authorization provisions impact federal oversight of security operations? What are the benefits and risks of these provisions? Please provide your views on these provisions.**
- A9. The Department of Energy, including the National Nuclear Security Administration (NNSA), strongly oppose certain sections of the bill because they would unduly restrict the authority of the Secretary of Energy, weaken safety standards, and/or fundamentally alter the nature of the relationship between the Department and its contractors.**

Sections 3113 and 3133 would excessively restrict the authority of the Secretary of Energy to oversee the management and operations of the NNSA. They would restrict the Secretary's ability to select the most appropriate oversight mechanism for its contractors. While we recognize that performance-based standards are an effective tool and may be sufficient for some low hazard/consequence activities, we believe that the Department must retain the ability to select the oversight mechanism that best protects national security interests for a given project, particularly for high hazard/consequence activities, such as operation of nuclear facilities or protection of special nuclear materials. The bill hampers our ability to tailor our approach to the needs of the government. Limiting the Department's ability to oversee contracts as appropriate may lead to more inefficiency and waste, not less. The fact that the Department's mandate is to provide adequate protection for its workers and the public while managing unique hazards as it conducts high-consequence activities, such as nuclear safety and security, makes it particularly important that the Department retain the ability to use all necessary tools to fulfill its mission.

We believe that independent oversight of safety and security standards, by an organization outside the line management chain that does not have conflicting priorities, is an important protection for the health and safety of our workers and the public. Given the nature and complexity of its mission, and, in particular, its obligation to preserve and protect America's national nuclear safety and security, the Department must address a number of unique, complex safety and security issues. We believe that it is essential for the Department to retain flexibility to safeguard against those unique risks, using all of the tools that science and our experience in this area afford. The proposed bill limits our ability to determine how best to execute the Department's mission safely, securely, and effectively.

Section 3115 would mandate that the NNSA alone establish and oversee health, safety and security at its facilities. Independent oversight of safety and security is an important protection for the health and safety of our workers and the public. The provision would also exempt the NNSA from the Department's existing process to enforce and ensure accountability for meeting safety and security requirements. Similarly, the bill would restrict the Department's ability to prescribe health and safety regulations regarding non-nuclear activities that are more stringent than Occupational Safety and Health Administration standards, by requiring waivers to permit use of more stringent standards. While we believe in the importance of streamlining regulatory burdens, we believe that the Department must be able to prescribe a safety regime that meets its unique needs without having to use waivers to do so.

**QUESTION FROM REPRESENTATIVE LORETTA SANCHEZ**

**Q10. What was the cost of shutting down Y-12 site following the incident, and was there any impact on schedule for programs?**

**A10. The actual cost accounted for by Y-12 was approximately \$2.9M primarily for the fully burdened labor rates of those people who could not perform their primary/alternative duties during the shutdown.**

**B&W Y-12 made up any schedule challenges created during the security shutdown and completed all primary deliverables scheduled for the year. While they made up the schedule using overtime as needed, the overtime costs for the year were considerably less than programmed for the year in the rates. This was accomplished by the contractor reducing overtime throughout the year in an effort to create savings. When the security event happened, they were executing at less than 50% overtime compared to planned rates based on prior years. The overtime needed to get back on schedule did not exceed planned annual overtime rates.**

### QUESTION FROM RANKING MEMBER MURKOWSKI

Q1. Do you think that future required R&D activities-- those that could be needed to address any outstanding issues, such as waste storage and transportation issues are enabled by the proposed legislation? Do we need to be more specific about the type of R&D that DOE and/or the new administration should carry out? Also, do you think that there are any open issues that may pose a challenge to get a storage facility and/or repository sited, licensed and constructed with the current timeline?

A1. The Administration is still reviewing the draft legislation, S. 1240.

While we expect there will be challenges in implementing the program, the timeline and program laid out in the Strategy is achievable but is dependent on legislation for full deployment. In the meantime, the Administration, through the Department of Energy (DOE), is undertaking activities within existing Congressional authorization to plan for the eventual transportation, storage, and disposal of used nuclear fuel. Activities range from examining waste management system design concepts, to developing plans for consent-based siting processes, to conducting research and development on the suitability of various geologies for a repository.

### QUESTIONS FROM SENATOR HEINRICH

Q1. In a consent-based process, what would be the appropriate range of terms and conditions for a state, tribe and local community to consent to hosting a repository or an interim storage facility? For example, in addition to a package of benefits and compensation, do you think states and tribes should be given a role in the regulatory, permitting and oversight of the storage facility or repository?

A1. Promising experiences in other countries indicate that a consent-based process, developed through engagement with states, tribes, local governments, key stakeholders, and the public, offers a greater probability of success than a top down approach to siting.

Defining consent, deciding how that consent is codified, and determining whether or how it is ratified by Congress are critical first steps toward siting the storage facilities and

repository. As such, they are among the near-term activities to be undertaken by the Administration in consultation with Congress and others. The Department is currently gathering information from the siting of nuclear facilities in the U.S. and elsewhere in order to better understand critical success factors in these efforts and to facilitate the development of a future siting process for a repository and storage facilities. As part of this process the Department will consider the question of host-requested terms and conditions. The Administration looks forward to working with Congress to develop a consent-based process that is transparent, adaptive, and technically sound.

The Administration's Strategy endorses the proposition that prospective host jurisdictions must be recognized as partners. Public trust and confidence is a prerequisite to the success of the overall effort, as is a program that remains stable over many decades; therefore, public perceptions must be addressed regarding the program's ability to transport, store, and dispose of used nuclear fuel and high-level radioactive waste in a manner that is protective of the public's health, safety, and security and protective of the environment.

Q2. The BRC's proposed consent-based process calls for a cooperative agreement for communities that host nuclear waste storage or disposal facilities. Such an agreement could include substantial financial commitments and possible regulatory roles not generally provided to states. Under such a consent-based process, would states and communities have greater confidence the government will actually meet its commitments if Congress also ratified the agreements made with the states, tribes and communities?

A2. Promising experiences in other countries indicate that a consent-based process, developed through engagement with states, tribes, local governments, key stakeholders, and the public, offers a greater probability of success than a top down approach to siting.

Defining consent, deciding how that consent is codified, and determining whether or how



it is ratified by Congress are critical first steps toward siting the storage facilities and repository. As such, they are among the near-term activities to be undertaken by the Administration in consultation with Congress and others. The Department is currently gathering information from the siting of nuclear facilities in the U.S. and elsewhere in order to better understand critical success factors in these efforts and to facilitate the development of a future siting process for a repository and storage facilities. The Administration looks forward to working with Congress to develop a consent-based process that is transparent, adaptive, and technically sound.

Q3. In the cooperative agreement with the state, tribe and local community for an interim storage facility, should there also be an enforceable deadline with penalties for failing to remove the waste from the storage facility? How large do you think such a penalty would have to be to assure a repository was in operation in 2048 as required? What would be the source of funds for the payment of penalties?

A3. The BRC recommended that “one or more consolidated (interim) storage facilities be developed to start the orderly transfer of used nuclear fuel from reactor sites to safe and secure centralized facilities independent of the schedule for operating a permanent repository.” The Administration agrees that interim storage should be included as a critical element in the waste management system. DOE has initiated a planning project with the objective of pursuing activities that can be conducted within the constraints of the NWPA and will facilitate the development of an interim storage facility, of a geologic repository, and of the supporting transportation infrastructure, including evaluating operational options for consolidated storage and furthering the design of a generic consolidated storage facility. The Department will continue with these activities within existing Congressional authorization while the Administration and Congress work together on potential changes to the nuclear waste management program.

## QUESTIONS FROM SENATOR SCOTT

### **Plutonium Disposition**

Q1. How can the Administration reconcile a “slowdown” to the program that could ultimately kill the MOX project, and simultaneously pledge to uphold our agreement with the Russians?

A1. The United States remains committed to achieving the important nonproliferation mission associated with the disposition of excess weapon-grade plutonium and to our agreement with Russia. However, considering the unanticipated cost increases associated with the MOX fuel approach and the current budget environment, the Administration is conducting an analysis to determine whether there are options to complete the mission more efficiently.

### **MOX Project**

Q2. How much will the slowdown of the MOX project affect its cost and schedule?

A2. As mentioned in response to your first question, the United States remains committed to achieving the important nonproliferation mission associated with the disposition of excess weapon-grade plutonium and to our agreement with Russia. However, considering the unanticipated cost increases associated with the MOX fuel approach and the current budget environment, the Administration is conducting an analysis to determine whether there are options to complete the mission more efficiently. Cost and schedule impacts will be a central component in determining next steps for fulfilling our plutonium disposition commitments.

Q3. What are NNSA’s estimates on how much it would cost to shut down the MOX project?

A3. NNSA does not have a current estimate of the cost to shutdown the MOX project.

- Q4. How much is the study expected to cost and where will the money come from- NNSA, NE, EM or elsewhere?
- A4. The Administration is conducting an analysis of plutonium disposition options, which is being funded primarily through NNSA.
- Q5. When is the study expected to be completed?
- A5. The Department intends to use the analysis in order to inform the FY 2015 budget.
- Q6. What are the other alternatives and are they consistent with the US-Russia agreement?
- A6. The analysis includes continuing the current path of disposing of plutonium as MOX fuel as well as other technically and financially feasible options. The U.S.-Russia Plutonium Management and Disposition Agreement (PMDA) allows for other disposition paths if agreed to by both parties.
- Q7. Will the US-Russia Agreement have to be amended if the Obama Administration shuts down the MOX project to use an alternative?
- A7. The United States remains committed to achieving the important nonproliferation mission associated with the disposition of excess weapon-grade plutonium and to our agreement with Russia. The U.S.-Russia Plutonium Management and Disposition Agreement (PMDA) allows for other disposition paths if agreed to by both parties.
- Q8. What assurance do we have that Russia will be amenable to something other the MOX process?
- A8. The U.S. will continue to engage Russia while conducting the options analysis and will work to continue progress in implementing the PMDA.
- Q9. What national security assessments will be made if the MOX project is ultimately shut down?

A9. The Department has not cancelled the MOX project, and we cannot prejudge the outcome of the options analysis.

Q10. What options have been previously reviewed and eliminated and what has changed since the time of those studies that these same options should be considered again? What new serious options exist today that have not already been evaluated?

A10. As previously mentioned, the United States remains committed to achieving the important nonproliferation mission associated with the disposition of excess weapon-grade plutonium and to our agreement with Russia. However, considering the unanticipated cost increases associated with the MOX fuel approach and the current budget environment, the Administration is conducting an analysis to determine whether there are options to complete the mission more efficiently. The options include continuing the current path of disposing of plutonium as MOX fuel as well as other technically and financially feasible options. Previous reviews of the Administration's plutonium disposition strategy will be taken into account in this new analysis. Some options are being analyzed that have been considered in the past; however, the new analysis will take into consideration new data and changes in the operating plans of DOE facilities.

Q11. How does the Administration intend to comply with the agreement with the State of South Carolina for the permanent disposition or removal of plutonium in the state?

A11. The Department understands our commitments under current legislation, and we will look to ensure compliance with the law as we analyze plutonium disposition options.

Q12. What will be the costs of complying with the agreement with the State of South Carolina and of non-compliance?

- A12. Beginning in 2016, current law stipulates “economic assistance” in the form of fines and penalties of \$1 million per day up to \$100 million per year, subject to appropriations.
- Q13. Does the Administration have a contingency for the removal of all the plutonium in the state of South Carolina?
- A13. The Department understands the provisions of current law, and we will look to ensure compliance with the law as we analyze options.
- Q14. If the MOX project is cancelled, will NNSA remove the plutonium from SRS, and if so, to where? How much will it cost to package, transport, safeguard and store this sensitive material?
- A14. The Department understands the provisions of the current law, and we will evaluate the costs associated with meeting requirements as the path forward is determined.
- Q15. If the plutonium storage facilities at Pantex are getting full, or, as the DOE IG found earlier this year may not be able to safely hold plutonium for much longer due to the age and condition of the storage bunkers, what is NNSA’s plan for the plutonium at SRS and Pantex?
- A15. Although aged, the storage facilities at Pantex are safe and continue to be maintained by NNSA as mission critical assets. Additionally, a recent DOE IG study focused its concerns on bunkers which comprise a portion of the facilities used for plutonium storage at Pantex. As part of ongoing efforts to develop NNSA’s plutonium strategy, we are evaluating effective ways to safely store plutonium.
- Q1. How many taxpayer dollars have been spent to date on DOE’s rulemaking regarding set-top box energy conservation requirements?
- A1. To date, DOE has spent a total of approximately \$2.9 million in contract funding and approximately \$300,000 on Federal salary and benefits on the development of energy conservation standards and test procedure development for set-top boxes. This includes

the development of the test procedure that is used to measure the energy efficiency of the set-top boxes. These test procedures are necessary as a foundation to both voluntary and regulatory programs.

Q2. How many taxpayer dollars does DOE anticipate spending during the lifecycle of this rulemaking process?

A2. A typical energy conservation standards rulemaking takes about 3 years to accomplish and costs approximately \$3 to \$5 million to complete, depending on the complexity of the rulemaking being performed. DOE is still early in the rulemaking process for set-top boxes, and acknowledges that funding of the process is subject to annual appropriations.

Q3. Has DOE contracted any of this rulemaking out to third parties? How much has been spent on the contractors?

A3. Yes, DOE has contracted approximately \$2.9 million for energy conservation standards analysis and test procedure development for set-top boxes to date. The analysis was provided to industry and others and supported the voluntary agreement discussion. Test procedure development and finalization is necessary for both voluntary agreements and mandatory regulations. Contractors represent one way for DOE to access the expertise it needs to advance a rulemaking for the timeframe DOE requires that expertise.

Q4. In terms of carbon dioxide emissions savings, what percentage of the United States' total carbon dioxide emissions do you anticipate DOE's set-top box energy conservation standards will save?

A4. DOE has not proposed an energy conservation standard for set-top boxes, so it is not yet possible to estimate the carbon dioxide savings that could occur from an energy conservation standard at this time. If DOE were to propose an energy conservation

standard, the proposed rulemaking would include an estimate of the potential carbon dioxide savings.

Overall appliance and equipment standards are saving consumers significant amounts on their energy bills and helping avoid significant emissions of carbon dioxide. Based on a recent study by Lawrence Berkeley National Laboratory<sup>1</sup>, Federal energy conservation standards promulgated through 2011 saved consumers an estimated \$42 billion on their utility bills and carbon emissions reductions attributed to the standards were realized at 176 million metric tons in 2011.

Q5. What percentage of total global carbon dioxide emissions do you anticipate DOE's set-top box energy conservation standards will save?

A5. DOE has not proposed an energy conservation standard for set-top boxes. If DOE were to propose an energy conservation standard, the proposed rulemaking would include an estimate of the potential carbon dioxide savings.

Q6. If industry is willing to achieve the same cost and energy savings throughout a voluntary agreement, is it still DOE's intention to proceed with a federal rulemaking process?

A6. DOE strongly encourages and will consider any non-regulatory agreement as an alternative to a regulatory standard. DOE recognizes that voluntary or other non-regulatory efforts by manufacturers, utilities, and other interested parties can result in substantial improvements to energy efficiency or reductions in energy consumption. In fact, as part of its rulemaking activities to consider a regulatory efficiency standard, DOE prepares a regulatory impact analysis. The regulatory impact analysis evaluates non-regulatory alternatives to standards, in terms of their ability to achieve significant energy

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<sup>1</sup> Lawrence Berkeley National Laboratory, Energy and Economic Impacts of U.S. Federal Energy and Water Conservation Standards Adopted From 1987 Through 2011, <http://ees.lbl.gov/pub/energy-and-economic-impacts-us-federal-energy-and-water-conservation-standards-adopted-1987-0>

savings at a reasonable cost, and compares the effectiveness of each one to the effectiveness of the proposed standards.

- Q7. Considering the American taxpayers are funding this federal rule making process, how do additional layers of government red-tape ultimately benefit the taxpayers considering the industry has agreed to set-top box energy efficiency standards at no cost to the taxpayer?
- A7. DOE's statutory requirement is to maximize energy efficiency that is technologically feasible and economically justified (42 USC 6295 (o) (2)). DOE's appliance standards program ensures that taxpayers are receiving cost-effective energy savings as justified by a thorough analysis of alternatives to determine which option conforms to this statutory requirement.

DOE's appliance and equipment standards program seeks to deliver significant benefits to consumers across the country across a wide variety of products. Overall appliance and equipment standards are saving consumers significant amounts on their energy bills and helping avoid significant emissions of carbon dioxide. Based on a recent study by Lawrence Berkeley National Laboratory<sup>2</sup>, Federal energy conservation standards promulgated through 2011 saved consumers an estimated \$42 billion on their utility bills and carbon emissions reductions attributed to the standards were realized at 176 million metric tons in 2011.

#### **QUESTIONS FROM SENATOR BALDWIN**

- Q1. You mention in your testimony the subject of commingling defense and commercial waste in the same repository as being a matter of policy since 1985. It is my understanding that the repository requirements for defense high-level waste and commercial spent fuel are quite different. In order to avoid further delays in nuclear

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<sup>2</sup> Lawrence Berkeley National Laboratory, Energy and Economic Impacts of U.S. Federal Energy and Water Conservation Standards Adopted From 1987 Through 2011 , <http://ees.lbl.gov/pub/energy-and-economic-impacts-us-federal-energy-and-water-conservation-standards-adopted-1987-0>



waste processing, clarity about regulatory authority for both defense high-level and commercial waste is essential. Given the opportunity, do you think that the US would benefit by re-separating these waste streams? And if so, do you think that the defense waste should remain with the Department of Energy or be transferred to the proposed Nuclear Waste Administration for management?

A1. The Nuclear Waste Policy Act requires that either a commingled repository or a defense-only repository be regulated by the Nuclear Regulatory Commission (NRC). As I indicated in my appearance before the Committee, the Department has a study underway to reevaluate whether or not the wastes should be commingled, which draws upon previous work done by the Department. Because the reevaluation is not complete, it is not yet clear what the results will be about commingling and what organization should have the responsibility.

Q2. The NWAA specifically calls for a pilot interim storage facility that accepts 'priority' used fuel. After Kewaunee Power Station closed in May of this year, along with the LaCrosse Boiling Water Reactor, the state of Wisconsin now has two shuttered plants whose fuel in residence would qualify as 'priority'. In the Administration's current Used Fuel Disposition 'Strategy', is there a similar priority placed on fuel residing at shuttered plants? Can you please elaborate on the Administration's position on the storage of 'priority' versus 'nonpriority' used fuel as it differs from the proposed Nuclear Waste Administration Act?

A2. The Administration is still reviewing the draft legislation, S. 1240. However, the Administration's Strategy specifically supports the development of a pilot interim storage facility with an initial focus on accepting fuel from shut-down reactor sites: "At its core, this Strategy endorses a waste management system containing a pilot interim storage facility; a larger, full-scale interim storage facility; and a geologic repository in a timeframe that demonstrates the federal commitment to addressing the nuclear waste issue, builds capability to implement a program to meet that commitment, and prioritizes

the acceptance of fuel from shut-down reactors...The Administration supports a nuclear waste management system with the following elements:

- A pilot interim storage facility with limited capacity capable of accepting used nuclear fuel and high-level radioactive waste and initially focused on serving shut-down reactor sites;
- A larger, consolidated interim storage facility, potentially co-located with the pilot facility and/or with a geologic repository, that provides the needed flexibility in the waste management system and allows for important near-term progress in implementing the federal commitment; and
- A permanent geologic repository for the disposal of used nuclear fuel and high-level radioactive waste.”



**Department of Energy**  
Washington, DC 20585

August 20, 2013

The Honorable Paul Broun, M.D.  
Chairman  
Subcommittee on Oversight  
Committee on Science, Space and Technology  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On June 27, 2013, Dr. Kathleen Hogan, Deputy Secretary for Energy Efficiency, Office of Energy Efficiency and Renewable Energy, testified regarding "Green Buildings – An Evaluation of Energy Savings Performance Contracts."

Enclosed are the answers to 21 questions that were submitted by Representatives Neugebauer, Hultgren, Schweikert, Weber, Peters and you for the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Brad Crowell", is positioned above the printed name.

Brad Crowell  
Acting Assistant Secretary  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Dan Maffei, Ranking Member



**QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS**

**Q1. As the office that oversees ESPCs, how comprehensive is the Federal Energy Management Program (FEMP) database of agencies' use of ESPCs? For example, does FEMP keep a record of all federal ESPC projects including the state of progress of each one? Do individual agencies do the same for their own projects?**

**A1. The Federal Energy Management Program (FEMP) maintains records of all federal Energy Savings Performance Contract (ESPC) projects (Task Orders) implemented under the Department of Energy's Indefinite Delivery, Indefinite Quantity (IDIQ) Contract. Included in these records is the state of progress of each project during development and information on awarded contracts. FEMP has limited information on federal ESPC projects implemented under other IDIQ contracts such as those administered by the US Army Corps of Engineers, or for site specific contracts not issued under an IDIQ. FEMP's information in those cases is limited to total annual investment for past years. FEMP also assists the Office of the Federal Environmental Executive and the Office of Management and Budget in tracking the progress of all ESPCs for the President's Performance Contracting Challenge (PPCC). However, the system used to track the results of the PPCC, does not collect the same amount of project level data which FEMP has on DOE IDIQ projects.**

**QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS**

**Q2. How often do agencies audit their use of ESPCs and broad performance information? Where is such information recorded?**

**A2. Agencies perform audits of ESPCs periodically. There have been a number of ESPC audits completed over past years by agency Internal Auditors, as well as agency programmatic self-audits. The results for a few of the IG audits can be found on the Agencies' respective IG websites. While FEMP is not aware of any set audit frequencies at other agencies, since 2009 DOE has committed to visiting active individual DOE held ESPC sites every three years, and has contacted project managers for DOE ESPCs on an annual basis to ensure each ESPC is performing as indicated in the contract.**

**Audits, are not required under the DOE IDIQ contract. While FEMP has provided some audit-related services to agencies in the past, FEMP has no formal collection or oversight of the independent audits completed by the Agencies.**

**Measurement and Verification Plans however are required for each ESPC. It is the agency's responsibility to be knowledgeable of M&V options, methods, and requirements. In addition, the agency is responsible for approving the ESCO's M&V plan according to FEMP's guidance. The agency must witness M&V activities and review calculations, utility bill records, and other elements of the baseline to confirm that the approved M&V plan is followed, as described in FEMP's Guide to Government Witnessing and Review of Post-Installation and Annual M&V Activities. The primary responsibility for witnessing M&V will**

fall on the Contracting Officer (CO), CO Representative (COR), or CO Technical Representative (COTR) depending on how it is outlined in the M&V plan.

FEMP ESPC resources are at [www.femp.energy.gov/financing/espcs\\_resources.html](http://www.femp.energy.gov/financing/espcs_resources.html)

**QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS**

- Q3. How are Super ESPCs negotiated, and what is the process by which ESCOs continue to maintain their Super ESPC status? What safeguards are in place to assure Super ESPCs deliver the state commitments over the lifetime of the contract?**
- A3. The DOE ESPC IDIQ contract was competed using full and open competition, resulting in multiple awards to 16 energy service companies (ESCOs). The current IDIQ was awarded in 2008 for a 5 year term, with two 3-year option renewals possible for contract extension. DOE recently opted to renew the current contract for one 3-year contract extension, until 2016. If DOE extends it for another 3-year term, until 2019, all ESCOs would then have to re-compete to be included in the DOE IDIQ umbrella contract. DOE awarded these umbrella contracts to ESCOs based on their ability to serve Federal agencies under terms and conditions outlined in the IDIQ solicitation. Under this contract, agencies can use ESPCs in Federal facilities, both domestic and international. Each ESCO has a \$5 billion ceiling amount, for ESPCs that may include energy efficiency, water conservation, greenhouse gas (GHG) emissions reduction investments, and renewable energy projects for Federally-owned buildings and facilities.**

**ESCOs must compete for each ESPC task order, issued under the IDIQ contract. DOE does not influence which ESCOs are selected for individual Task Orders awarded under the IDIQ, only that they must conform to the requirements of the IDIQ umbrella contract. The contract negotiations associated with the Task Order awards are managed by the respective Agency Contracting Officers. The projects are reviewed prior to award, in part, to assess the reasonableness of the proposal, and the projects require annual Measurement and Verification**

to ensure equipment continues to operate as specified over the contract term and that the guaranteed savings are being achieved/delivered annually.

*\*The term Super ESPC has been replaced with the term DOE ESPC IDIQ.*



**QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS**

**Q4. How often have changes in utility rates impacted savings? What is the effect on Federal agencies engaged in ESPCs when utility rates go either higher or lower?**

**A4. Contractor payments under an ESPC are generally based on fixed utility price escalation rates.**

The default escalation rates are those projected by the Department of Energy's Energy Information Agency (EIA). On an annual basis, EIA compares its projections with energy prices that actually occurred. In almost all cases, EIA has under-predicted actual utility price escalation. This means that on a whole, the government is paying the ESCO less than the savings are worth. If there was a decline in energy prices (\$), relative to the estimated price escalation schedule in the contract, it is possible for the reported ESCO energy savings (\$) to be less than what was originally guaranteed in the contract; however with the reduced energy prices (\$) the government would still achieve an overall reduction in their utility costs.

QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS

Q5. A 2005 GAO report noted the 2004 establishment of “a special working group to address the uncertainties about actual savings”<sup>1</sup> between FEMP and DOD. Referred to as the Energy Savings Discrepancy Resolution Working Group, it was to develop “approaches to compare projected and actual savings and to explain any deviations.”<sup>2</sup> What findings have emerged from this group, and what is its current status?

A5. The working group completed its task and published its findings in the summer 2005 issue of FEMP Focus ([http://www1.eere.energy.gov/femp/pdfs/fempfocus\\_summer\\_2005.pdf](http://www1.eere.energy.gov/femp/pdfs/fempfocus_summer_2005.pdf)).

The key findings of the report were that there are two factors that are largely responsible for the discrepancy between the guaranteed energy savings in ESPCs and actual utility bills.

These factors are load creep (i.e., increases in energy use due to new construction and mission changes) and utility cost increases which occur every year at both ESPC sites and at sites where no significant energy efficiency projects have been implemented. While load creep and utility cost increases are problematic to predict when calculating the guaranteed energy savings, FEMP recommends Agencies and ESCOs use M&V protocols that are appropriate relative to the various energy conservation measures implemented. These other M&V approaches can provide further detail relative to realized savings, even in cases where utility bill reconciliation may have limitations.

The DOE ESPC IDIQ requires active agency input regarding the pre-installation baseline, which is now defined to include factors beyond the ESCO’s control that influence post-installation energy use (e.g., building occupancy, weather, plug load creep, etc.). The ESCO is

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<sup>1</sup> GAO Report, “Performance Contracts Offer Benefits, but Vigilance Is Needed to Protect Government Interests,” GAO-05-340, June 2005, available at: <http://www.gao.gov/new.items/d05340.pdf>;

<sup>2</sup> Ibid.

required to verify operation of the installed equipment/systems, calculate the previous year's energy and water savings, and compare verified and guaranteed savings annually.

**QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS**

- Q6. Are all federal agencies on track to meet the President's goal established in 2011 of engaging in \$2 billion worth of ESPCs by the end of 2013?**
- a. Are agencies trying to meet this goal because of the President's 2011 memo, or because they need to? In other words, absent the President's memo, would all agencies still be trying to engage in \$2 billion worth of ESPCs by the end of 2013?**

**A6a. The Presidential Performance Contracting Challenge established a comprehensive goal for the Federal government to enter into a minimum of \$2 billion in performance contracts. Agencies have committed to 302 potential ESPC and UESC projects with an estimated \$2.3 billion in investment value. As of July 2013, contracts have been awarded for 72 projects with an investment value of \$621.5 million and 230 projects remain in the development pipeline. While some Agencies have already awarded final contracts in FY 2013, FEMP expects most Agencies will be completing final contract actions during the first quarter of FY 2014 or very close to the December 31 target. FEMP is working with agencies to achieve this momentous challenge and streamline contracting processes which historically, have taken about two years to award.**

**Given the numerous requirements related to energy, water, and emissions reduction, as well as goals for increasing renewable energy use, Agencies have and will continue to have a need to use performance contracts to meet these statutory and Executive Order goals. The Challenge has helped reinvigorate, improve and streamline processes for the use of ESPCs and UESCs throughout the government, and we anticipate they will be increasingly used into the future, given the current fiscal climate and the continued need for efficiency investments in federal buildings.**

**QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS**

**Q6. Are all federal agencies on track to meet the President's goal established in 2011 of engaging in \$2 billion worth of ESPCs by the end of 2013?**

**b. How does this monetary goal impact the quality of the ESPCs? How do agencies evaluate impact beyond just how many dollars were spent?**

**A6b. The investment goal is not expected to impact quality as both Agencies and ESCOs have adequate resources and processes in place to ensure quality projects are awarded. Agencies should evaluate the impact of their investment relative to its contribution to their efforts to meet mission, achieve energy savings, reduce energy intensity of their buildings, conserve water, and reduce greenhouse gas emissions in addition to evaluating the total cost-benefit of the project. Several key agency sustainability goals can be positively impacted by the investments associated with these contracts. Agencies ensure the high quality of their ongoing implementation of ESPC contracts through measurement and verification procedures. The M&V plan is the primary vehicle for first documenting and then periodically evaluating the performance expectations of the project. The DOE ESPC IDIQ requires additional details in the M&V plan to ensure that the ESCO and agency thoroughly understand what the Task Order covers.**

**QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS**

**Q7. As interest rates fluctuate, can ESPCs be re-negotiated to take advantage of lower finance rates, and if so, under what restrictions?**

- a. With record-low interest rates in recent years, how many ESPC contracts have been re-negotiated to save agencies money?**

**A7a. Agencies and ESCOs can work together to refinance ESPCs, and have done so on a limited basis to date. Agencies can engage the ESCOs on refinancing; however, responsibility rests with the ESCO to discuss debt modification with its financier. It is important to recognize that ESPC debt service agreements are between an ESCO and its financier, the Government is not a contractual party to the financing agreement.**

**While DOE's existing ESPC IDIQ contracts contain no express authority for an agency to request refinancing from the ESCO, the individual agency can include such a requirement in its own stand-alone ESPC or task order, allowing it to direct an ESCO to refinance or otherwise modify its ESPC debt. Ideally, such a modification would result in a revised contract or task order payment schedule and contract modification.**

**QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS**

**Q7. As interest rates fluctuate, can ESPCs be re-negotiated to take advantage of lower finance rates, and if so, under what restrictions?**

**b. If an ESPC is bundled with other ESPCs and sold to a secondary source, does FEMP have measures to ensure that re-negotiating ESPCs are always available as an option to agencies to take advantage of lower interest rates?**

**A7b. Agencies and ESCOs can work together to refinance ESPCs. Agencies can engage the ESCOs on refinancing; however, responsibility rests with the ESCO to discuss debt modification with its financier. It is important to recognize that ESPC debt service agreements are between an ESCO and its financier, the Government is not a contractual party to the financing agreement.**

**Agencies can optimize their projects by taking advantage of the broad latitude and flexibilities built into these contracts, allowing them to modify the guarantee, reassign ESCO services, and reallocate responsibilities in order to meet their needs and priorities.**

## QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS

**Q8.** Is there a standard or uniform system of measuring ESPC costs that must be covered by savings? Also, how consistently do savings actually cover costs, and how is that information calculated, verified, and maintained?

**A8.** The International Performance Measurement and Verification Protocol (IPMVP) is the standard method by which guaranteed savings are measured. The IPMVP is maintained with the sponsorship of DOE by a broad international coalition of facility owners/operators, financiers, contractors or Energy Services Companies (ESCOs) and other stakeholders. Energy conservation measures covered by the IPMVP include fuel saving measures, water efficiency measures, load shifting and energy reductions through installation or retrofit of equipment, and/or modification of operating procedures.

Savings are tracked through the annual measurement and verification reports on each DOE IDIQ project. On a project level, for the most part, savings cover costs, although in a few cases payments to the ESCO have been reduced to reflect lower verified savings. At any given time, a few ESCOs and agencies may be engaged in efforts to resolve identified shortfalls, which, historically, have resulted in a resolution consistent with the requirements of the contract. FEMP tracks the results of these reports and with assistance from the Oak Ridge National Laboratory. ORNL generates an annual savings report that documents the results of M&V for all active projects. The report verifies that the guaranteed savings requirements have been met, or exceeded.



## **QUESTION FROM CHAIRMAN BROWN AND CHAIRMAN LUMMIS**

**Q9. How can agencies verify that an ESCO's Monitoring & Verification (M&V) practices are completely accurate? What role does DOE play in this?**

**A9. A condition of a DOE ESPC award is a requirement to have a Measurement and Verification (M&V) plan, which describes how the savings will be verified for each energy conservation measure (ECM), and includes details on the how they will be measured, to what schedule and utilizing what techniques. It is the responsibility of the Agency's Contracting Officer, assigned to the project, to be knowledgeable of all M&V options, methods, and requirements. The agency is responsible for negotiating and approving the ESCO's proposed M&V plan according to DOE guidance. The agency then must witness M&V activities and review calculations, utility bill records, and other elements of the baseline to confirm that the approved M&V plan is followed.**

DOE provides several tools to aid the M&V decision-making process for DOE ESPCs. DOE also has a life of contract service which contacts the agencies and individuals responsible for each active ESPC project within DOE's IDIQ portfolio of projects. Twice per year, contact is made to identify the current status of projects. FEMP's Guide to Government Witnessing and Review of Post-Installation and Annual M&V Activities provides Agencies with the relevant guidance, however the primary responsibility for witnessing M&V will fall on the Contracting Officer (CO), CO Representative (COR), or CO Technical Representative (COTR) depending on how it is outlined in the M&V plan.

## QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS

**Q10. Energy savings estimates are all based on a static evaluation of existing technologies. For example, a new building technology may provide for a 5% improvement in energy efficiency over the lifetime of the ESPC, however, two years later a new technology may emerge that would provide a 20% saving. How is dynamic technology development integrated and considered into ESPCs?**

**A10. Generally, ESPCs are long-term contracts that are not particularly well suited to deal with the dynamic replacement of technology. It should be noted that, if appropriated funds were utilized to perform ECMs in which the technology becomes outdated in the near future, there would be no recourse for any type of upgrade. However, a technology installed by an ESCO under an ESPC can be replaced by the agency (using either another ESPC or using appropriated funds) before the contract term ends. However, as with any energy conservation technology, the replacement must be economically feasible. During the feasibility study, the agency will estimate the likely savings from the technology, as well as the cost, which would include the cost of paying the current ESCO the remaining outstanding capital on that particular ECM.**

QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS

Q11. In what ways can the Department of Energy provide more oversight on ESPCs to ensure that all forms of energy efficiency technology are being utilized, and that technologies are prioritized on their overall energy efficiency impacts?

A11. DOE has developed tools and training to encourage both Agencies and ESCOs to fully explore all efficiency and renewable options that could have an impact on the site. The efficiency impact of the technologies, while perhaps the largest driver in the decision making, will be impacted by issues of cost effectiveness, compatibility with the mission requirements, etc.

One type of training tool specifically offered by FEMP is the Renewable Energy and Advanced Efficiency Technologies Planning session, which provides free screenings and guidance to identify cost-effective opportunities for agencies to implement energy-efficient products and renewable energy technologies.

FEMP ESPC training: [http://www1.eere.energy.gov/femp/financing/espcs\\_training.html](http://www1.eere.energy.gov/femp/financing/espcs_training.html)

**QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS**

- Q12. How does an agency – or FEMP – ensure that an ESCO is offering an agency competitive financing and terms in ESPCs? How much competition is there among the companies that finance ESPCs, and is there a mechanism to provide for a robust financial analysis to further reduce the financing costs?**
- A12. FEMP's IDIQ contract requires ESCOs to obtain multiple bids for the financing and that the process is transparent. In most cases, ESCOs obtain three bids and choose the one that provides the best value for the government. In addition, FEMP compares project interest rates with interest rates on other recent awards to determine whether the interest rate is comparable.**

**QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS**

**Q13. Are there instances of energy savings companies not fulfilling their contractual duties? What happens in those cases and how many are there?**

**a. Conversely, what happens when agencies don't meet their contractual obligations? What are the some of the reasons for such an event, and how often has that occurred?**

**A13a. ESPCs provide Agencies a flexible and practical vehicle for customizing energy projects to their site-specific needs. These flexibilities allow the Agencies to identify and modify potential issues before they endanger the project, mitigating the risk of default or breach.**

**While contracting officers at individual agencies are responsible for administering ESPCs, FEMP is not aware of any contracts that were terminated because of a default or failure by either the Agency or the ESCO. FEMP's statistics on terminated contracts indicate that, as of May 2013, 76 Delivery Orders have been closed out since 1998, with 58 being terminated prior to completion due to convenience in agreement with the ESCO and 18 completing their full contractual term (e.g. the 12 year contract that is completed after its 12<sup>th</sup> contract year).**

**The term "Convenience" includes Government buy out according to the cancellation schedule, base or building closure, the use of end of year appropriations, refinancing, etc. In some of these cases, Agencies with a surplus of end of year appropriations have chosen to buy out the rest of the ESPC contract, which is an option in all ESPCs contracts. All ESPC contract have a stipulated buy out price, providing another avenue of flexibility to the Agencies.**

**FEMP has a proactive approach that mitigates contract issues before they occur. Shortfalls are identified through a FEMP project team and any perceived issues are mitigated. These**

**mechanisms are built into the ESPC to safeguard the Agency and ESCO. If issues are identified that need follow-up, the DOE ESPC team determines what actions to take. Some examples of typical project issues include training for agency participants on how to navigate the ESPC process and develop a high-value project and advising agencies on their rights and responsibilities if a contract dispute arises.**

**QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS**

**Q13. Are there instances of energy savings companies not fulfilling their contractual duties? What happens in those cases and how many are there?**

**b. In either of these situations, what recourse do the wronged parties have, and who arbitrates disputes between agencies and ESCOs?**

**A13b. FEMP is not aware of any contracts that were terminated because of a default or failure by either the Agency or the ESCO. FEMP's statistics on terminated contracts indicate that, as of May 2013, 76 Delivery Orders have been closed out since 1998, with 58 being terminated prior to completion due to convenience in agreement with the ESCO and 18 completing their full contractual term (e.g. the 12 year contract that is completed after its 12<sup>th</sup> contract year). . The term "Convenience" includes Government buy out according to the cancellation schedule, base or building closure, the use of end of year appropriations, refinancing, etc.**

**FEMP works with Federal agencies, which have the ultimate responsibility for their contracts, to see that strong contracts are in place and then provides life of contract support to help address and correct any issues along the way, so contracts do not fail. Through M&V plans and ongoing monitoring, issues are identified and if necessary the amount paid on the contract can be adjusted or the ESCOs can be required to replace equipment to ensure the appropriate savings are achieved. The Federal ESPC Steering Committee is also a resource available to Agencies to help to address common issues and find solutions. Therefore, FEMP is not aware of any DOE IDIQ projects that have ever reached the level where arbitration was required.**

**QUESTION FROM CHAIRMAN BROUN AND CHAIRMAN LUMMIS**

**Q14. How many DOE facilities are currently unoccupied or unused? Has DOE entered into ESPCs for any of them, and if no, why not?**

**A14. DOE has 6,791 buildings and trailers that are unoccupied and 1,191 buildings and trailers that are not utilized. Unoccupied buildings include warehouses and storage space in addition to other buildings with no current users. Buildings not currently utilized are labeled as zero percent utilization in DOE's real property management system.**

**Certain unoccupied buildings at DOE sites may no longer have mission relevance and may be candidates for cleanup, demolition, or potential reuse in the future.**

**ESPC applications for vacant buildings are likely to be limited (especially for buildings slated for near term demolition), but may include measures such as converting fire sprinkler systems from water to chemical based systems, thus allowing for the building to go into a completely unheated state. All of DOE's major laboratory sites were assessed for opportunities to utilize ESPCs and UESCs within the past 5 years, with active project reviews undertaken at approximately 20 sites, resulting in nearly \$500 million in energy related investments.**



## QUESTION FROM CONGRESSMAN NEUGEBAUER

**Q1. The use of ESPCs has raised questions about how these contracts should be reflected in the federal budget. Currently ESPCs are not “scored,” but the Congressional Budget Office (CBO) believes that the obligation to make payments and financing costs is incurred when the government signs the ESPC, and should score the full cost to reflect this commitment as a new obligation at the time of signing. This is very similar to an issue that is preventing Veterans Affairs medical hospitals from being constructed due to CBO’s scoring of the leases up front.**

**a. If the scoring method were to change to reflect the CBO method, how would this impact agency usage of ESPCs?**

**A1a. The ESPC permanent authority, which was scored by CBO upon enactment, permits an agency to enter into multiyear contracts for a period of up to 25 years as long as it has the funds available for payment of the first year’s costs and the ESPC agreement guarantees energy savings sufficient to cover the full cost of the Federal investment. One of the significant advantages of ESPCs is that such contracts allow agencies to undertake energy saving upgrades and enables them to pay for the investment as savings accrue.**

**QUESTION FROM CONGRESSMAN HULTGREN**

**Q1. In 2009, the Department of Energy awarded a 15-year ESPC at Fermilab for 1.4 million in upfront cost projecting savings of 3.25 million over the life of the contract.**

**a. Are these savings on track to reach their expected potential within the 15-year timeline? If not, why not?**

**A1a. Fermilab's ESPC Project is on track to realize its expected potential for the remaining term of the contract. For additional information, please see the response to Question 1b.**

## **QUESTION FROM CONGRESSMAN HULTGREN**

**Q1. In 2009, the Department of Energy awarded a 15-year ESPC at Fermilab for 1.4 million in upfront cost projecting savings of 3.25 million over the life of the contract.**

**b. What is the total savings amount thus far? How is that amount being measured and verified?**

**A1b. Total savings in the first two years of the performance period (May 2011 to June 2013) amount to \$346,683. This exceeds annual performance guarantees and is documented in the annual measurement and verification (M&V) reports.**

**Savings are being measured and verified in accordance with applicable laws and guidance.**

**The Energy Services Company (ESCO) is required to complete, at a minimum, an annual performance review of each energy conservation measure (ECM) to ascertain that the performance guarantee was achieved during the prior 12 months. The Federal Acquisition Regulation, ESPC statutes, and the DOE ESPC Indefinite Delivery Indefinite Quantity (IDIQ) contract specify those processes which the ESCO must follow to execute the annual M&V inspection. In addition, DOE Federal Energy Management Program (FEMP) guidance prescribes the responsibilities of the Government for witnessing the ESCO's annual M&V activities and reviewing its annual M&V reports.**

## QUESTION FROM CONGRESSMAN HULTGREN

**Q2. Are there any potential downsides to the federal use of ESPCs?**

**a. If so, how can we improve the program to negate these weaknesses?**

**A2a. While there are many opportunities for the use of ESPC's, DOE must ensure that performance contracts remain high-value projects that deliver savings through extensive outreach, training and communication with stakeholders and Agencies. ESPCs are a type of contract that is different from what most Federal agencies are used to executing, and requires contracting officers to be well-trained in managing them. DOE provides several forms of assistance and project facilitation to help agencies ensure they develop ESPC projects that are technically excellent, contractually and legally sound, financially smart and that deliver results.**

**Another re-occurring challenge to ESPC project implementation is the time involved due to the number of discrete steps and corresponding documents/contract deliverables.**

**Historically, it has taken anywhere from six months to five years to execute an ESPC. In response, FEMP put together new best practices for steps in the process, including the notice of opportunity, the preliminary assessment, and the investment grade audit that should help achieve reduced cycle time and avoid duplication of efforts. This has resulted in significant progress in shortening the schedule for agencies to make ESPC awards. Currently, it typically takes about 24 months for a contract to be awarded.**

**FEMP is continually reviewing the DOE IDIQ contract, the FEMP-provided contract documents and templates, and ESPC training materials to identify opportunities to streamline**

the process and make improvements to allow projects to be awarded as efficiently and expeditiously as possible.

**QUESTION FROM CONGRESSMAN SCHWEIKERT**

**Q1. Do you know of any instances under an ESPC where there is a purchase buyback?**

**a. How often does this occur?**

**A1a. While the Department of Energy (DOE) does not have information on agreements between all federal sites and their utilities relating to the sale of excess energy, we do have project descriptions that include project size for most renewable energy conservation measures (ECMs) within the DOE energy savings performance contract (ESPC) program that may provide insight into this issue. In reviewing the data, almost all ESPC renewable ECMs are below 1 megawatt (MW) and while there are a few 700-900 kilowatt (kW) photovoltaic and wind ECMs, the output of each represents a small percentage of the site's overall electricity consumption.**

**QUESTION FROM CONGRESSMAN SCHWEIKERT**

**Q1. Do you know of any instances under an ESPC where there is a purchase buyback?**

**b. What are the circumstances for this occurring?**

**A1b. While the Department of Energy (DOE) does not have information on agreements between all federal sites and their utilities relating to the sale of excess energy, we do have project descriptions that include project size for most renewable energy conservation measures (ECMs) within the DOE energy savings performance contract (ESPC) program that may provide insight into this issue. In reviewing the data, almost all ESPC renewable ECMs are below 1 megawatt (MW) and while there are a few 700-900 kilowatt (kW) photovoltaic and wind ECMs, the output of each represents a small percentage of the site's overall electricity consumption.**

**QUESTION FROM CONGRESSMAN SCHWEIKERT**

**Q1. Do you know of any instances under an ESPC where there is a purchase buyback?**

**c. Does this effect total savings?**

**A1c. The Department of Energy (DOE) does not have information on agreements between all federal sites and their utilities relating to the sale of excess energy, we do have project descriptions that include project size for most renewable energy conservation measures (ECMs) within the DOE energy savings performance contract (ESPC) program that may provide insight into this issue. In reviewing the data, almost all ESPC renewable ECMs are below 1 megawatt (MW) and while there are a few 700-900 kilowatt (kW) photovoltaic and wind ECMs, the output of each represents a small percentage of the site's overall electricity consumption.**



#### QUESTION FROM CONGRESSMAN WEBER

Q1. While executing the President's recent energy directive, which rulemakings do you expect to finalize first and how soon should we expect to see these?

A1. DOE is actively working on many rulemakings in support of the President's energy goals. These rulemakings are in various stages of development, with some further along in the process than others. The Regulatory Agenda provides a listing of the Department's regulatory activities and projected timeframes for those activities. The 2013 Spring

Regulatory Agenda can be found at:

<http://resources.regulations.gov/public/custom/jsp/navigation/main.jsp>.

## **QUESTION FROM CONGRESSMAN PETERS**

**Q1. In what specific areas do the goals of energy efficiency and resiliency dovetail? Could an ESPC be used to make buildings upgrades that both save energy and increase the resiliency of building infrastructure and critical infrastructure? For example, when you think about an ESPC for a federal data center, would the improvements made also improve the data centers ability to withstand extreme weather events?**

**A1. It is possible that such projects would improve a structure's ability to withstand extreme weather events. Combined heat and power (CHP) projects implemented with an ESPC could also be designed to operate during utility outages caused by weather events, such as Hurricane Sandy. One example is an ESPC project at FDA's White Oaks site. Their CHP system has been able to supply electricity and heat to continue their mission during power outages. This type of resiliency application of ESPC could be considered at other federal sites in combination with other energy cost savings measures.**

**All payments in an ESPC must come from energy savings, including energy –related operations and maintenance. To the extent that energy conservation measures include aspects that also address resiliency, such measures could be considered in the development of an ESPC.**

## **QUESTION FROM CONGRESSMAN PETERS**

- Q2. What elements are already in place for ESPCs to incorporate resiliency goals and recommendations so that ESPCs can fully incorporate resiliency as part of the audit or proposed plan?**
- A2. DOE-FEMP is currently working with the Army to develop a method of combining an ESPC with a building renovation project designed to upgrade the interior and exterior of a structure. Certain ECMs such as cool roofs, vapor barriers, and efficient windows could potentially be installed more economically if a portion of the cost was paid by the appropriated funds used to perform the building renovation. It is possible that such a project would improve a structure's ability to withstand extreme weather events.**

**All payments in an ESPC must come from savings in energy costs, including energy –related operations and maintenance. To the extent that energy conservation measures include aspects that also address resiliency, such measures could be considered in the development of an ESPC. The added benefit of potentially addressing resiliency is another example of how ESPC's help support the goals of the Presidents Climate Action Plan.**



## Department of Energy

Washington, DC 20585

August 20, 2013

The Honorable Mary Landrieu  
Chairman  
Committee on Small Business and Entrepreneurship  
United States Senate  
Washington, DC 20510

Dear Madam Chairman:

On June 20, 2013, the Committee on Small Business and Entrepreneurship held a Roundtable entitled, "Sequestration: Small Business Contractors Weathering the Storm in a Climate of Fiscal Uncertainty."

Enclosed are the answers to nine questions that were submitted by you and Senator Shaheen, to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Brad Crowell", is positioned above the printed name.

Brad Crowell  
Acting Assistant Secretary  
Congressional and Intergovernmental Affairs

Enclosure

cc: Ranking Member Jim Risch



SENATE SMALL BUSINESS AND ENTREPRENEURSHIP COMMITTEE  
ROUNDTABLE MEETING: IMPACT OF SEQUESTRATION ON SMALL BUSINESS  
CONTRACTS

JUNE 20, 2013

QUESTIONS FROM SENATOR LANDRIEU

**GENERAL QUESTIONS - ALL AGENCIES**

- In responses to the April 1<sup>st</sup> sequestration letter, several agencies indicated that their agency includes small business utilization standards in annual performance plans for senior executive service employees who impact small business achievement.

Q1. How does this affect agencies' achievement of their small business goals?

A1. The inclusion of a small business performance standard in the annual performance review of senior executives (SES) may result in their greater focus on small business goals and should positively affect achievement of our small business goals. The Secretary of Energy issued a memorandum (dated December 20, 2012) that approved the inclusion of a small business performance standard in the FY13 annual performance reports of senior executives whose responsibilities substantially impact small business utilization.

Q2. Will increasing the government-wide small business prime contracting goal from 23% to 25% guarantee increased opportunities for small businesses?

A2. A change of small business prime contracting goal from 23% to 25% would not guarantee an increase in opportunities for small businesses.

- In your submitted remarks, you stated that DOE is structured under a management & operating (M&O) model which awards roughly 80 percent of its procurement base to large prime contractors who run the national laboratories and field sites. This model affords the majority of DOE's small business spend to fall under M&Os as subcontracting.

Q3. What are some potential changes with respect to M&O and other management contracts that could result in an increase in Federal prime contract awards or obligations to small business?

A3. There are currently no intended changes with respect to the structure of DOE's M&O model that would significantly affect small business opportunities. The public-private partnership of the DOE model affords the agency the ability to effectively fulfill its mission critical responsibilities to our nation. DOE continues to work hand-in-hand with our M&O contractors to increase small business opportunities.

- Your Senate confirmed position as Director of the Office of Economic Impact and Diversity (ED) requires you to report directly to the Energy Secretary. However, you are not required to report solely to the Secretary, as required for OSDBU Directors in Section 15(k)(3) of the Small Business Act.

Q4. How does this affect your ability to advocate for small business?

A4. As a point of clarification, the President Appointed and Senate Confirmed (PAS) position is the Director of the Office of Minority Economic Impact (OMEI) and by law is not required to report to the Secretary of Energy. As the head of a first tier organization, I have a great opportunity to strongly advocate for small business. It provides me with a seat at the table with all the program office and support office heads who are my counterparts (many of whom are also PAS) across the Department. The Department is currently considering changes to its organizational structure in light of the recent changes to section 15(k).

LaDoris G. Harris/Date: August 20, 2013  
Phone Number: (202)586-8383

Preparation Lead: ED/OSDBU  
Preparation Team Name(s): John Hale  
Phone Number(s): (202)586-4620

## QUESTIONS FROM SENATOR SHAHEEN

Q1. As you know, federal agencies are required to report on their small business contracting results on a yearly basis. Considering the difficulties and abnormalities created by sequestration, it would be helpful to understand how agencies are performing so far this year. Is your agency meeting its small business goals this year so far? If not, how much of the shortfall do you attribute to sequestration? What kind of obstacles does sequestration present when it comes to small business contracting?

A1. DOE is tracking small business prime achievement via its Small Business Dashboard.

This enables DOE to monitor our small business achievement on a monthly basis by individual program office. Currently in FY2013 our prime small business achievement is 4.26% (via

[www.smallbusiness.data.gov](http://www.smallbusiness.data.gov)) as of 7/19/13, which is 61% towards our annual goal. The

Department is diligently working towards meeting our prime, subcontractor and socio-economic goals. Additionally, the Department is mounting a fourth quarter push to increase small business awards.

Q2. Meeting federal agency small business contracting goals is an important objective. But since small businesses are often at a disadvantage compared to larger firms, meeting federal agency small business contracting goals requires special effort by contracting officials. What communications have you or your agency issued to contracting officials about meeting their small business goals this year under sequestration?

A2. The communications below were issued within DOE to assist the Department in meeting its prime and subcontracting goals:

- April 11, 2013 – The Office of Small and Disadvantaged Business Utilization (OSDBU) issued request for forecast of contracting opportunities to Heads of Department Elements
- March–April, 2013 – OSDBU held conference calls and meetings with program offices and HQ procurement to update eSRS subcontracting records to ensure reporting accuracy;

January, 2013 – Departmental Elements were informed via e-mail communication to update FY 2013 acquisition data in DOE's prime and subcontracting business forecast.

Q3. One of the concerns I have heard is that small business subcontractors have been impacted because prime contractors are facing cuts. Have you contacted your prime contractors to understand how they are handling their small business subcontracting?

A3. The Department continues to hold prime contractors accountable for meeting their small business goals. While overall procurement and, therefore, subcontracting dollars are reduced we believe our prime contractors remain capable of meeting their established goals. As overall budgets are reduced, both prime contractors and subcontractors will see reduced dollar availability. DOE's historical subcontracting small business achievement is impressive. In FY2012, 47.5% of eligible subcontract dollars were awarded to small businesses. We continually work closely with our large contractors to meet their subcontracting goals and therefore did not issue separate correspondence.

Q4. Could you provide us with any recommendations you have made to the agency head to lessen the burden and adverse impact on small business of budgets cuts and sequestration? Have these recommendations been acknowledged or implemented?

A4 The Departments' executive and senior leadership are committed to supporting small businesses. The DOE's small business program and advocacy is being promoted through the following initiatives:

- 1) Secretary of Energy issued a memorandum requiring inclusion of a performance element in FY2013 performance plans for DOE Senior Executive Service members who can substantially affect the organization's small business baseline.
- 2) The Small Business First Policy was issued by the Deputy Secretary of Energy to ensure prime contracting opportunities are available to the maximum extent practicable to small businesses.



- 3) DOE entered into a Memorandum of Understanding with the Minority Business Development Agency of the Department of Commerce to increase the pipeline of capable, and responsive small businesses.
- 4) The OSDBU attended, participated in and/or co-sponsored forty four (44) outreach events throughout the country with a range of small business advocacy organizations.
- 5) The OSDBU requested and GSA hosted a training session at DOE on the use of the preparation and retrieval of standard and ad hoc reports from the Federal Procurement Data System-Next Generation (FPDS-NG) for contracting and program office personnel.
- 6) DOE on-site Small Business Administration Procurement Center Representative (PCR) and OSDBU participated in the Department's Acquisition Workshop (December 2012) on Section 1331 of PL 111-240, Best Practices, Market Research, and a GAO Decision regarding the importance of market research before making awards.

The OSDBU promotes the Department's over 100 small business multiple award contracts (MACs) to program offices to expedite placing tasks with small businesses. The MACs and the aforementioned initiatives are being used to offset sequestration's impact on small business contracting.

### **Improving Individual Office Small Business Contracting**

Q5. As you know, federal agencies report on their small business contracting goals on an agency-wide basis. While this exercise holds federal agencies publicly accountable, I am interested in learning more about how well each individual office within an agency is doing and whether it may be appropriate for some larger offices to have small business contracting goals. Will you please provide the Committee with your small business contracting numbers broken down by each individual office?

A5. Through the use of a range of data management initiatives, DOE has increased its engagement with the Federal Procurement Data System – Next Generation, and the SBA's

Small Business Dashboard (both are official government websites used to track and monitor all federal government agencies small business achievement). Various strategies and tools are in place for each individual office use to ensure small business utilization is used to the maximum extent practicable.



## Department of Energy

Washington, DC 20585

August 27, 2013

The Honorable Ed Whitfield  
Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On June 18, 2013, Christopher Smith, Acting Assistant Secretary for Fossil Energy, testified regarding the "U.S. Energy Abundance: Regulatory, Market, and Legal Barriers to Export."

Enclosed are the answers to four questions that were submitted by Representative Joe Barton to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher E. Davis", is written over the typed name.

Christopher E. Davis

Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosure

cc: The Honorable Bobby L. Rush, Ranking Member



## QUESTION FROM REPRESENTATIVE BARTON

Q1. Is DOE statutorily obligated to consider the cumulative impact of liquefied natural gas export authorizations? Please provide the legal argument defending your position.

A1. DOE is required by statute to review whether a proposed authorization for the export of liquefied natural gas (LNG) is consistent with the “public interest.” *See* 15 U.S.C. § 717b(a) (“[DOE] shall issue such order upon application, unless, ... it finds that the proposed exportation ... will not be consistent with the public interest.”).

DOE’s review of LNG export applications focuses on: (i) the domestic need for the natural gas proposed to be exported, (ii) whether the proposed exports pose a threat to the security of domestic natural gas supplies, (iii) whether the proposed export arrangement is consistent with DOE’s policy of promoting market competition, and (iv) any other factor bearing on the public interest. These factors include economic impacts, international impacts, security of natural gas supply, and environmental impacts.

As one such factor, DOE considers the cumulative impact of each successive LNG export authorization on domestic natural gas supply and demand fundamentals. *See, e.g., Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC*, DOE/FE Order No. 3282, Order Conditionally Granting Long-Term Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel From the Freeport LNG Terminal on Quintana Island, Texas, to Non-Free Trade Agreement Nations, at 5-7, 112-113 (May 17, 2013). DOE’s review of this factor enables the agency to assess the impact of all LNG export authorizations to date on the security and availability of domestic natural gas supplies. DOE believes that this analysis is a key determinant of the public interest.

QUESTION FROM REPRESENTATIVE BARTON

- Q2. Please define "cumulative impact" as referred to in the Freeport LNG Order (DOE/FE Order No. 3282).
- A2. "Cumulative impact" refers to the additional impact(s) on the public interest associated with each successive authorization to export liquefied natural gas, focusing on the effect of the export on domestic natural gas supply and demand fundamentals.

QUESTION FROM REPRESENTATIVE BARTON

Q3. Please list the factors that DOE will consider in the cumulative impact analysis.

A3. DOE/FE's review of LNG export applications focuses on: (i) the domestic need for the natural gas proposed to be exported, (ii) whether the proposed exports pose a threat to the security of domestic natural gas supplies, (iii) whether the proposed export arrangement is consistent with DOE/FE's policy of promoting market competition, and (iv) any other factor bearing on the public interest. These factors include economic impacts, international impacts, security of natural gas supply, and environmental impacts.

As one such factor, DOE considers the cumulative impact of each successive LNG export authorization on domestic natural gas supply and demand fundamentals. See, e.g., Freeport LNG Expansion, L.P. and FLNG Liquefaction, LLC, DOE/FE Order No. 3282, Order Conditionally Granting Long-Term Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel From the Freeport LNG Terminal on Quintana Island, Texas, to Non-Free Trade Agreement Nations, at 5-7, 112-113 (May 17, 2013). DOE's review of this factor enables the agency to assess the impact of all LNG export authorizations to date on the security and availability of domestic natural gas supplies. DOE believes that this analysis is a key determinant of the public interest.

## QUESTION FROM REPRESENTATIVE BARTON

**Q4.** Please describe how DOE would evaluate economic, international and environmental considerations in each of the following scenarios. Please include any additional criteria DOE would consider. Your comments will aid in the illustration of DOE policy regarding review of the public interest standard.

- a. Company A applies for authorization to export LNG to a non-FTA country seeking to prevent gas supply interruptions by reducing its dependence on geopolitically unstable regions.
- b. Company B applies for authorization to export LNG to a non-FTA country seeking to diversify its gas supply routes in order to negotiate a lower price from another supplier.
- c. Company C applies for authorization to export LNG to a non-FTA country seeking to diversify its energy portfolio in order to meet environmental goals.
- d. Company D applies for authorization to export LNG to a non-FTA country seeking to supply a new natural gas power plant that will provide villages with reliable and affordable electricity for the first time.

**A4.** Section 3(a) of the Natural Gas Act (15 U.S.C. § 717b(a)) sets forth the standard for review

of LNG export applications to non-free trade agreement countries. This provision creates a rebuttable presumption that a proposed export of natural gas is in the public interest.

DOE/FE must grant such an application unless opponents of the application overcome that presumption by making an affirmative showing of inconsistency with the public interest. In making a public interest evaluation, DOE will consider a number of criteria. DOE identifies the criteria considered as part of DOE's public interest review process in each Federal Register Notice of Application, which domestic need for the gas proposed for export, adequacy of domestic natural gas supply, as well as economic, international and environmental considerations, among others. Because each unique application has many criteria that the Department may consider, it is not possible to isolate the impact, and how the Department would consider, the hypothetical scenarios posed here.



## Department of Energy

Washington, DC 20585

August 27, 2013

The Honorable Ron Wyden  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On July 18, 2013, Peter Davidson, Executive Director, Loan Programs Office, testified regarding, "Clean Energy Finance."

Enclosed are the answers to five questions that were submitted by Senators Manchin, Portman, Schatz and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis", is positioned above the printed name.

Christopher E. Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosure

cc: The Honorable Lisa Murkowski, Ranking Member





## QUESTIONS FOR THE RECORD

07.18.13 Clean Energy Finance Full Committee Hearing

### FROM SENATOR MANCHIN

- Q1. Mr. Davidson, as you state in your testimony, your department has just released a solicitation for advanced fossil energy projects. The President announced that this would happen during his climate change plan announcement last month, saying \$8 billion worth of loan guarantees for Fossil Energy projects.

While this sounds good, it doesn't mean anything unless we actually approve a project and it gets built. The truth is that this \$8 billion was already available through a 2008 Fossil loan guarantee solicitation, yet the President didn't approve any projects.

For example, I know that the loan guarantee department reviewed an application for a coal to liquids plant in Medicine Bow, Wyoming, and from what I understand, your department completed the technical review of the project, but it hasn't been approved. If we offer funding but never approve any projects, that's just smoke and mirrors, and I'm concerned that's what will happen with this "new" solicitation.

I know that you are new on this job, but I wanted to know if you can comment on the status of the Medicine Bow project and why it hasn't been granted a loan. I'd also like your assurances that we will actually fund some of these projects that are ready to go and just need a little help.

- A1. While the Department cannot address individual applications that are under consideration, I can assure you we work to reach decisions on projects as expeditiously as possible. In an effort to improve transparency and involve stakeholders early in the process, the Department has made the draft solicitation available for public comment.

### FROM SENATOR PORTMAN

- Q1. Under Section 1703 of the Energy Policy Act of 2005, DOE loan guarantees are available for energy projects that avoid, reduce or sequester air pollutants and anthropogenic greenhouse gas emissions and that "employ new or significantly improved technologies" as compared to technologies currently in commercial use. DOE recently announced that it would be renewing its focus on power generation projects employing carbon capture technologies. Certain components of CCS projects employ established commercial technologies, including elements of the power plant itself, the CO2 pipeline and the injection of CO2 for EOR. I have been told that the integration of the capture, transport and storage associated with power generation has not yet been accomplished on a commercial scale in the United States, and that the inability to finance all of the components required for a successful CCS project is a major stumbling block to achieving commercial scale CCS.

## QUESTIONS FOR THE RECORD

### 07.18.13 Clean Energy Finance Full Committee Hearing

Would the financing of a pipeline that is a critical part of a project to carry CO2 from a first commercial scale power plant using a carbon capture technology to a field where the CO2 can be used for EOR qualify for a loan guarantee under Section 1703?

A1. When issued, the solicitation will seek applications for projects and facilities that cover a range of technologies. These technologies could include any fossil technology that is new or significantly improved, as compared to commercial technologies in service in the U.S. Applicants must show that their proposed project avoids, reduces, or sequesters air pollutants or greenhouse gas emissions. In addition to soliciting public comment about the technologies that DOE identifies in the draft solicitation, DOE welcomes comments that identify other technologies within its statutory authority that DOE should consider supporting through this loan guarantee solicitation.

Q2. Mr. Davidson, as you know, the House and Senate Appropriations Committees have recognized the critical national role the American Centrifuge project (ACP) plays in our nation's national security, and has included language in their respective Energy and Water measure to authorize DOE to transfer up to \$48 million to compete the RD&D phase of the program. With the closure of the Paducah enrichment facility, the ACP, located in Ohio, will be the only source of domestic uranium enrichment needed to produce the tritium for the US weapons program. The government has committed \$200 million to date, in this RD&D program, which will result in advanced centrifuge machines available to partially meet the nation's future domestic enrichment needs. The commercialization of the ACP will create over 8,000 jobs nationally, with 4,000 of them in my state alone. Companies in 28 states are manufacturing the centrifuge machines.

As the RD&D is completed late this year, the applicant for the \$2 billion loan guarantee intends to update and reactivate their application. It is hoped that with the successful conclusion of the RD&D program, your loan division will have all the data necessary to expedite the department's consideration of the application. With all this current and new information and knowledge obtained from the RD&D program, there is an urgent need to avoid bureaucratic delays in the transition from RD&D to the loan guarantee. Significant delays could derail the national security benefits of moving forward with the ACP.

In that regard, I urge you to include the critical knowledge and expertise obtained by Oak Ridge, NE and NNSA, as they have been monitoring and observing the RD&D program on a daily basis. In order to make the most knowledgeable assessment of the merits of the application, the knowledge and data obtained by Oak Ridge, NE and NNSA are essential.

Does your office intend to use the Department's collective expertise on this important technology by including Oak Ridge, NE, and NNSA in the loan guarantee review process?

A2. During the due diligence process for any project, Loan Programs staff members collaborate with a wide range of experts and advisors to make the most knowledgeable assessment of the project's technology and creditworthiness, including, for example,

## QUESTIONS FOR THE RECORD

07.18.13 Clean Energy Finance Full Committee Hearing

relevant programs throughout the Department, DOE labs, and third party financial, technical, and legal advisors.

### **FROM SENATOR SCHATZ**

- Q1. Cheap financing is important to scale up renewable energy, and as a consequence, drive down costs. I agree with this in principle but since most renewables use power purchase agreements to sell energy to utilities, it seems that securing a long-term stream of income may be more important. Power purchase agreements typically need to be approved by Public Utility Commissions. Similar to transmission constraints, there may be other issues limiting the scaling of renewables even with improved financing. What are your thoughts on addressing these other issues? How do they compare to the need for cheap financing in terms of importance to the renewable industry?
- A1. Each project faces three major costs: equipment and labor, financing costs, and “soft costs”, which represent permitting and other regulatory matters. While access to debt financing on reasonable terms is a critical component for the health of any industry, you are correct that it not in itself sufficient to ensure the viability of that industry. One issue that DOE cannot address through the Loan Programs Office is soft costs, such as the time it takes a project to achieve approval from a public utility commission. However, an industry can only become financeable by debt if it addresses many of the other concerns you allude to, including technological feasibility, regulatory compliance and creditworthiness.

### **FROM SENATOR WYDEN**

- Q1. In your testimony you gave a very brief overview of the actions DOE has taken to respond to feedback from audits of the loan programs by the GAO and Herb Allison. Could you please expand on this overview to discuss these actions in greater detail?
- A1. Please see the table below which tracks LPO’s efforts to address all issues raised by the GAO, DOE IG, and Mr. Allison.

# QUESTIONS FOR THE RECORD

07.18.13 Clean Energy Finance Full Committee Hearing

## ISSUES RAISED AND ACTIONS TAKEN BY THE LOAN PROGRAMS OFFICE

	ISSUES <sup>1</sup>	LPO ACTIONS TO ADDRESS	STATUS
1.	<b>Personnel:</b> Fill key management positions	Hired an Executive Director, Director of Risk Management, Permanent Chief Counsel	Completed
2.	<b>Internal Oversight:</b> Risk function is not sufficiently strong and independent	Created a Risk Management Division, consisting of credit origination, credit review and compliance, and enterprise-wide compliance.  Hired a Director of Risk Management.	Completed
3.	<b>External Oversight:</b> Not sufficient external oversight, particularly for "best practices"	DOE is in the process of forming an Advisory Committee comprised of senior government officials from other government financial and lending institutions, such as OPIC, Ex-Im Bank, Department of Treasury, and USDA. This board will advise the Programs on best practices for both underwriting and portfolio management.	On-going
4.	<b>Application Process:</b> Application process is slow and unwieldy	Developed and employ state-of-the-art proprietary workflow management system that includes an online application portal.  Electronic submissions of applications through the portal have reduced average application review times by nearly 80 percent.	Completed
5.	<b>Records Management:</b> Records management system is insufficient	Developed and employ state-of-the-art, centralized data system (Documentum) that is fully populated with records for all of the closed and conditionally committed transactions and is fully integrated with our portfolio management system (Quicksilver).  Over 16K separate files and 27GB of data are stored.  Revised records management protocol to better integrate document and records management into our daily business practices, ensuring that our records management practices continue to meet or exceed all applicable standards, regulations, and best practices.	Completed
6.	<b>Projects with No Offtake:</b> Projects without a fixed-price offtake have caused all of the LPO losses to date	Revised the structure of the loan disbursement requirements for such loans, particularly those that are manufacturing. Originally, on manufacturing deals, we disbursed the loan funds in connection the initial manufacturing line (Solyndra). Now, we require many conditions to the first disbursement, including that the	Completed

<sup>1</sup> These are concerns that have been identified by LPO, GAO, IG, Independent Consultant's Report (Allison Report), and other third party reports (including some from Congress).

# QUESTIONS FOR THE RECORD

## 07.18.13 Clean Energy Finance Full Committee Hearing

		first manufacturing line is performing as expected. This new structure has meant that manufacturing projects receive little to no loan funds until their business models are proven.	
7.	<b>Early Warning System:</b> There needs to be better formal communication to DOE senior management of problem loans.	<p>LPO has improved, and will continue to improve, processes and systems for proactive monitoring, loan administration, compliance, reporting, and resolution capabilities.</p> <p>LPO provides the following reports to the following entities on a regular basis:</p> <ul style="list-style-type: none"> <li>• Annual credit reports (to Risk Committee, CRB, OMB)</li> <li>• Weekly watch list reports (to Risk Committee, DOE Senior Management, OMB)</li> <li>• Monthly watch list reports (to CRB) (until halted at the request of CRB)</li> <li>• Monthly portfolio reports (to Risk Committee, DOE Senior Management, OMB) (to commence after scope is confirmed with the new Executive Director)</li> <li>• Quarterly portfolio reports (to commence after scope is confirmed with the new Executive Director) (to Risk Committee, CRB, DOE Senior Management, OMB)</li> </ul>	On-going
8.	<b>Lessons Learned:</b> No formal "lessons learned" process	The updated policy and procedures manual (which is currently in draft form and expected to become final this summer) incorporates lessons learned, as do the day-to-day activities of the LPO.	On-going
9.	<b>Interagency Process:</b> The interagency process is cumbersome, not user-friendly, and not transparent.	LPO and Treasury have entered into an MOU regarding the consultation process for any future LPO projects.	On-going
10.	<b>Policies and Procedures Manual:</b> Regularly update the LGP's policies and procedures manual to reflect current program practices to help ensure consistent treatment for applications to the program	The policies and procedures manual has been updated and such updated version is expected to be approved in the near future.	On-going
11.	<b>Public Communication:</b> Improve reporting to and communications with the public	<p>LPO has revised its website to include more information pertinent to the public and its constituents and will continue to update the website as projects progress.</p> <p>LPO will issue its next solicitation in draft form, so that we may receive and consider comments from the</p>	On-going

# QUESTIONS FOR THE RECORD

## 07.18.13 Clean Energy Finance Full Committee Hearing

		public before officially issuing it.	
12.	<b>Credit Re-Estimation:</b> Policies, procedures, and internal controls for the credit re-estimation process need to be improved	The Loan Policy Committee meets regularly and is comprised of portfolio, origination, and credit, with support from Summit (contractor that is in charge of the credit subsidy model).  In conjunction with OMB, the Committee has revised the model to address errors and incorporate best practices.	Completed
13.	<b>Law Firm Waiver Tracker:</b> No formal tracking system for managing law firm waiver requests	Developed and employed a formal tracking system.	Completed
14.	<b>Strategic Planning:</b> Engage in long-range strategic planning	A three-year strategic and operating plan is currently under review.  LPO is in the process of evaluating how its performance goals and measures align with the Department's goals. Performance measures for these goals will be incorporated in future solicitations.	On-going
15.	<b>Application Tracker:</b> Commit to a timetable to implement a system to track the status of applications and that measures overall program performance	LPO has an ongoing application tracker and continuously monitors several indicators of overall performance of the programs (e.g. project specific metrics such as greenhouse gases avoided or jobs supported)	Completed



## Department of Energy

Washington, DC 20585

September 26, 2013

The Honorable Cynthia Lummis  
Chairman  
Subcommittee on Energy  
Committee on Science, Space, and Technology  
U.S. House of Representatives  
Washington, DC 20515

Dear Madam Chairman:

On July 25, 2013, Mr. Christopher Smith, Acting Assistant Secretary, Office of Fossil Energy, testified regarding "The Future of Coal: Utilizing America's Abundant Energy Resources."

Enclosed are the answers to 10 questions that were submitted by Representative Kramer and you, to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher E. Davis".

Christopher E. Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional & Intergovernmental Affairs

Enclosures

cc: The Honorable Eric Swalwell, Ranking Member



## QUESTIONS FROM REPRESENTATIVE CYNTHIA LUMMIS

U.S. HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY  
Hearing on the Future of Coal: Utilizing America's Abundant Energy Resources  
July 25, 2013

**Q1. Please provide the current status of and outlook for the advanced fossil fuel conditional loan guarantees announced in 2009. Why have those conditional loan guarantees not yet been finalized?**

**A1. The Department has not issued any fossil energy conditional commitments to date.**

Current applicants for fossil energy loan guarantees as of August 26, 2013 are as follows

(\$millions):

Program	Authority	Sector	Project Name	Requested Loan Amount
<b><i>Fossil Projects - Due Diligence Pipeline</i></b>				
Title 17	1703	Coal Gasification	Project 1	\$ 2,815
<b><i>Fossil Projects - On Hold</i></b>				
Title 17	1703	Coal Gasification	Project 2	\$ 1,750
Title 17	1703	Coal Gasification	Project 3	\$ 1,700

Each of these projects has a number of open issues that need to be resolved before DOE could determine, as is required by statute, that there exists "a reasonable prospect of repayment of the principal and interest on the obligation by the borrower." Some of these issues involve local and state legislatures or other governing bodies, on which the Loan Programs cannot force a timeline.



## **QUESTIONS FROM REPRESENTATIVE CYNTHIA LUMMIS**

### **U.S. HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY Hearing on the Future of Coal: Utilizing America's Abundant Energy Resources July 25, 2013**

**Q2. In April, a report issued by the MIT Energy Review concluded that even with revenues from enhanced oil recovery (EOR), natural gas prices would have to be above \$9 for a CCS plant to be economically preferable over natural gas. The Energy Information Administration is projecting that natural gas prices will remain below \$6 for at least the next 20 years.**

**b. Please provide a detailed list of all non-CCS research activities, including award recipient, project description, date, funding amount, and length of activity.**

**A2b. All of the projects in the Fossil Energy (FE) clean coal program support FE's mission to enhance national energy security and to reduce emissions of greenhouse gases (GHG) from fossil fueled energy systems. However, many of these projects also contribute toward the achievement of multiple other energy-related goals. For example, advanced Integrated Gasification Combined Cycle (IGCC) plants reduce GHG emission due to their high efficiency and their ability to more easily separate CO<sub>2</sub> from the process. However, depending on the process configuration, advanced IGCC plants can be used to produce electric power and/or chemical products. This concept, known as polygeneration, can be used to take advantage of changes in market demand and prices for products over time. Similarly, solid oxide fuel cells (SOFC) also offer high efficiency and an easily separated CO<sub>2</sub> stream but in addition can operate at < 20% load (great for grid stability where large fluctuations in energy generation or demand exist) and provide a way to produce electric power, heat, and water from the same unit. In addition, innovative materials, sensors, and controls that are necessary for development and**

operation of these and other technologies e.g. advanced ultra-supercritical steam cycles, can be applied broadly to both the existing U.S. fleet of fossil fuel plants and to new plants resulting in improve efficiency, reliability, and lower cost operation.

## QUESTIONS FROM REPRESENTATIVE CYNTHIA LUMMIS

### U.S. HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY Hearing on the Future of Coal: Utilizing America's Abundant Energy Resources July 25, 2013

**Q3. DOE recently announced the availability of an \$8 billion in authority for loan guarantees for advanced fossil energy projects. Are current activities funded through the Clean Coal Power Initiative or as part of the American Recovery and Reinvestment Act CCS demonstration projects eligible for these loan guarantees?**

**A3.** The \$8 billion in loan guarantee authority that has been allocated to fossil projects was made available under the Omnibus Appropriations Act of 2009. That Act prohibits the use of such authority, subject to certain limited exceptions, for loan guarantees for projects where “funds, personnel or property...of any Federal agency...are expected to be used...to support the project or to obtain goods or services from the project”.

Compliance with this limitation must be certified by the Director of the Office of Management and Budget. The determination whether this restriction would render a specific project ineligible for the 2009 loan guarantee authority is necessarily fact specific, and must be based on a thorough understanding of the project. It is not possible to say with certainty how a broad category of projects may be affected by the restriction.

## **QUESTIONS FROM REPRESENTATIVE CYNTHIA LUMMIS**

### **U.S. HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY Hearing on the Future of Coal: Utilizing America's Abundant Energy Resources July 25, 2013**

**Q4. The National Coal Council (NCC) is a Federal Advisory Committee tasked with advising the Secretary of Energy – at his request – on general policy matters relating to coal. The last five NCC reports focused exclusively on CCS and the NCC has not weighed in on non-CCS coal issues in over seven years. Given the critically important non-CCS technology and regulatory issues facing the coal industry, there are why hasn't DOE tasked the NCC to undertake a broader review of coal policy issues? Will DOE task NCC with such a request? If not, what is planned instead?**

**A4.** For the past decade, the Department has focused on the issues associated with the largest market for the use of coal in the United States. That market by far is electrical power. Over the years, the NCC has produced excellent reports on a variety of topics including regulatory, policy, technology and market issues. The Department is presently in discussions with the NCC regarding the next study. There are a broad range of topics being considered including one related to coal policy issues.

## **QUESTIONS FROM REPRESENTATIVE CYNTHIA LUMMIS**

### **U.S. HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY Hearing on the Future of Coal: Utilizing America's Abundant Energy Resources July 25, 2013**

**Q5. Please provide the current status of and outlook for the eight remaining CCS demonstration projects, including DOE obligated amounts, current phase, spending project to date, whether the project has received accelerated funding, and DOE/recipient cost share amounts and commitments by phase. Please also provide forthcoming key factors and decision points of the eight remaining CCS demonstration projects and how DOE will examine those points to determine each project's viability.**

**A5. Listed below is the information requested on the eight remaining carbon capture and storage (CCS) demonstrations projects:**

- Demonstration of a Coal-Based Transport Gasifier; Southern Company Services; Kemper County, Mississippi; ~\$4.1B est. total plant cost, DOE share \$270M ; Integrated Gasification Combined Cycle (IGCC); 3,000,000 tons of CO<sub>2</sub>/year to EOR. Construction is continuing (~72% complete); shakedown of various unit operations has commenced with full integrated operations to begin in May 2014.
- Texas Clean Energy Project; Summit Texas Clean Energy LLC ; Penwell, Ector County, Texas; \$3B total est. cost, DOE share \$450M ; IGCC/polygeneration (baseloaded); 2,200,000 tonnes of CO<sub>2</sub>/year to EOR (Financial close expected in October 2013 with construction to begin shortly thereafter). Plant operation is scheduled to commence in late 2017.
- Hydrogen Energy California (HECA) Project; Hydrogen Energy California LLC (a project company owned by SCS Energy); Bakersfield, Kern County, California; \$5B

total est. cost, DOE share \$408M; IGCC/polygeneration (load following); 2,570,000 tonnes of CO<sub>2</sub>/year to EOR. Financial close expected in June 2014 with construction beginning in January 2015. Plant operation is scheduled to begin in mid-2019.

- W.A. Parish Post-Combustion CO<sub>2</sub> Capture & Sequestration Project; NRG Energy; Thompsons, Texas; \$775M total est. cost, DOE share \$167M; post-combustion capture at an existing coal-fired power plant; 1,400,000 tonnes of CO<sub>2</sub>/year to EOR. Financial close is expected in March 2014. Operation is expected to begin in mid-2016
- FutureGen 2.0; FutureGen Alliance, Meredosia, Morgan County, Illinois; \$1.77B total est. cost, DOE share \$1.05B; oxy-combustion repowering; 1,000,000 tons of CO<sub>2</sub>/year to saline storage. Financial close is expected in summer 2014 with construction beginning in the Fall 2014. Plant operation is expected to commence in mid-2017.
- Demonstration of CO<sub>2</sub> Capture and Sequestration of Steam Methane Reforming Process Gas Used for Large-Scale Hydrogen Production; Air Products & Chemicals; Port Arthur, Texas; \$431M total est. cost, DOE share \$284M. CO<sub>2</sub> from steam methane reforming for hydrogen manufacture at an oil refinery; 925,000 tonnes of CO<sub>2</sub>/year to EOR. Plant operation began in December 2012 and reached full capacity in March 2013. As of August 14, 2013, over 420,000 short tons of CO<sub>2</sub> have been sold for EOR.
- CO<sub>2</sub> Capture from Biofuels Production and Storage into the Mt. Simon Sandstone; Archer Daniels Midland (ADM); Decatur, Illinois; \$208M total est. cost, DOE share \$141M (ARRA) (68%); CO<sub>2</sub> capture from an ethanol plant; 900,000 tonnes of CO<sub>2</sub>/year to saline storage. Construction is continuing (~50% complete)' shakedown and commissioning of the CO<sub>2</sub> compression and dehydration facilities has been

initiated. Awaiting EPA Class VI injection well permit, expected January 2014, to begin drilling well. Plant operation expected to begin in July 2014, assuming EPA Class VI operating permit is issued in June 2014.

- Lake Charles Carbon Capture & Sequestration Project; Leucadia Energy LLC; Lake Charles, Louisiana; \$436M total est. cost, DOE share \$261M; CO<sub>2</sub> capture from a petroleum coke-to-methanol gasification facility; 4,500,000 tonnes of CO<sub>2</sub>/year. Financial close is expected by December 2013 with construction to commence in January 2014. Plant operation is expected to begin in mid-2017.

## **QUESTIONS FROM REPRESENTATIVE CYNTHIA LUMMIS**

### **U.S. HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY Hearing on the Future of Coal: Utilizing America's Abundant Energy Resources July 25, 2013**

**Q6. The Department of Energy's flagship CCS demonstration project, FutureGen, has been fraught with cost overruns, project delays, and an ever-changing membership of the private consortium. Please provide an update on this project and the outlook for its successful completion.**

**A6. Former Secretary Steven Chu approved the continuation of the FutureGen 2.0 Program into Phase II in February 2013. This approval entailed the creation of several sub-phases designed to ensure the project meets important milestones on an aggressive schedule. At this time, the FutureGen project is on track to meet all of its Phase II milestones, and remaining funds are being expended in a timely manner. The FutureGen program has spent \$92 million of the \$1.048 billion obligated to the project, leveraging an industry investment of ~\$717 million. Construction is currently scheduled to begin after financial close in Fall 2014 with operation commencing in Summer 2017.**



## **QUESTIONS FROM REPRESENTATIVE KEVIN CRAMER**

### **U.S. HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY**

#### **Hearing on the Future of Coal: Utilizing America's Abundant Energy Resources**

**July 25, 2013**

**Q1. The Environmental Protection Agency is moving forward with greenhouse gas regulations on both new and existing coal-fired power plants. In EPA's initial regulatory proposal for new plants released last year, the EPA rulemaking assumed that CCS technology would be commercially available within ten years of a plant initiating operations.**

**a. Mr. Smith, do you agree that the proposed EPA rule – which I understand is now under revision – would effectively ban the construction of new coal plants without CCS?**

**A1a. On September 20, 2013, the EPA issued a new proposal for Carbon Pollution Standards for New Power Plants. The proposed limits for fossil-fuel-fired utility boilers and IGCC units are based on the performance of a new efficient coal unit implementing partial carbon capture and storage (CCS).**

## **QUESTIONS FROM REPRESENTATIVE KEVIN CRAMER**

### **U.S. HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY Hearing on the Future of Coal: Utilizing America's Abundant Energy Resources July 25, 2013**

**Q1. The Environmental Protection Agency is moving forward with greenhouse gas regulations on both new and existing coal-fired power plants. In EPA's initial regulatory proposal for new plants released last year, the EPA rulemaking assumed that CCS technology would be commercially available within ten years of a plant initiating operations.**

**b. Would you also agree that in order for CCS to be part of a new coal plant, significant technical, legal, property rights, and liability issues must first be resolved?**

**A1b. In 2010, the Interagency Task Force on Carbon Capture and Storage issued a formal report regarding the status of carbon capture and storage (CCS) technology. The report found that "while there are no insurmountable technological, legal, institutional, regulatory or other barriers that prevent CCS from playing a role in reducing GHG emissions, early CCS projects face economic challenges related to climate policy uncertainty, first-of-a-kind technology risks, and the current high cost of CCS relative to other technologies." The report further found that the key barrier to CCS deployment is the lack of comprehensive climate change legislation.**

**A number of commercial-scale CCS demonstration plants supported by DOE will begin operation over the next five years, and these plants are expected to show considerable progress in addressing current challenges to CCS deployment.**

## **QUESTIONS FROM REPRESENTATIVE KEVIN CRAMER**

### **U.S. HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY Hearing on the Future of Coal: Utilizing America's Abundant Energy Resources July 25, 2013**

**Q1. The Environmental Protection Agency is moving forward with greenhouse gas regulations on both new and existing coal-fired power plants. In EPA's initial regulatory proposal for new plants released last year, the EPA rulemaking assumed that CCS technology would be commercially available within ten years of a plant initiating operations.**

**c. With that in mind, what is the earliest time frame in which you can state with confidence that CCS will be commercially available at utility scale?**

A1c. Several commercial carbon capture and storage (CCS) technologies have already been developed in different industries and applications. Current carbon capture and storage (CCS) electricity generation and industrial demonstration projects are focusing on 1<sup>st</sup> generation technologies which are available today. These projects will begin operation over the next 5 years. These facilities are expected to show that CCS can be operated reliably, predictably, and safely at utility scale. The next generation of transformational CCS technologies will be even more economically attractive.

## **QUESTIONS FROM REPRESENTATIVE KEVIN CRAMER**

### **U.S. HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY Hearing on the Future of Coal: Utilizing America's Abundant Energy Resources July 25, 2013**

**Q2. Your testimony notes that commercial scale CCS will increase electricity prices between 35 and 70 percent. How is this pursuit consistent with your office's mission to ensure the nation can continue to rely on coal for affordable energy?**

**a. Please explain why DOE has decided to place nearly all of its resources into an unproven technology that, even if "successful," would increase electricity prices so dramatically, instead of a more balanced approach that could improve the efficiency and environmental performance of existing coal plants.**

**A2a. The Office of Fossil Energy is charged with advancing technologies related to the reliable, efficient, affordable, and environmentally sound use of fossil fuels, which are essential to our Nation's security and economic prosperity. The focus of our research is reducing the overall cost of CCS by reducing CO<sub>2</sub> capture cost and other plant costs by improving plant efficiency and developing more cost-effective environmental controls.**

**With respect to the current cost of CCS systems, our studies show that CCS does add a cost relative to current wholesale electricity prices. Actual impacts on end users would depend on a range of factors including: ability to sell CO<sub>2</sub> or other byproducts, local regulatory structure (e.g. some areas of the country currently have carbon prices) and whether the project receives other incentives (local and/or federal), as well as the level of capture implemented. In addition, in the absence of comprehensive climate change legislation the cost of energy related CO<sub>2</sub> emissions is a negative externality borne upon the general public. FE RD&D is currently developing 2<sup>nd</sup> generation technologies that**

will improve the efficiency and reliability of carbon capture processes to facilitate the transition to a low-carbon energy system. Using recent EIA natural gas price forecasts, systems analyses indicate that a coal-fueled power plant with 2<sup>nd</sup>-generation CCS technologies could produce electricity at a cost that is competitive with a NGCC power plant without CCS. These technologies would be competitive when the CO<sub>2</sub> captured by the coal plant is sold for use in enhanced oil recovery (EOR). RD&D pathways are being explored that could further reduce CCS cost.

When evaluating the potential of advanced technology, it is important to consider both the potential future performance of a technology as well as future prices. A large portion of the Fossil Energy RD&D is focused on improving the efficiency and reducing the cost of the base power plant through gasification and other advanced power system improvements. In the past, FE has adjusted its R&D portfolio to be responsive to Administration and Congressional priorities, and will continue to do so if further diversification in its RD&D program is needed.

## QUESTIONS FROM REPRESENTATIVE KEVIN CRAMER

### U.S. HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY Hearing on the Future of Coal: Utilizing America's Abundant Energy Resources July 25, 2013

- Q3. The Western Research Institute is developing WRITECoal™ gasification technology<sup>4</sup> to greatly increase the efficiency of coal gasification. Will this technology be available for commercial application in the timeframes called for in the president's greenhouse gas regulations on new power plants?**
- A3.** On September 20, 2013, the EPA issued a new proposal for Carbon Pollution Standards for New Power Plants. This technology could be available for commercial application in the timeframes called for in this proposal. The current R&D project ended in 2011 after successful bench and pilot scale testing of individual components of the technology.

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<sup>4</sup> The WRITECoal Gasification technology is one that combines gasification with a coal upgrading process to significantly enhance efficiency and reduces capital cost. The technology is being developed by WRI with activities at a pilot scale today. The Lignite Research Council is contributing funds toward this technology along with the Department of Energy and the State of Wyoming.

## **QUESTIONS FROM REPRESENTATIVE KEVIN CRAMER**

### **U.S. HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY**

#### **Hearing on the Future of Coal: Utilizing America's Abundant Energy Resources**

**July 25, 2013**

**Q4. Are the resources available to affect technology development called for in the CURC road map developed with input from DOE, the Electric Power Research Institute, and the Coal Utilization Research Council membership?**

**a. Is the timeline outlined in the administration's proposed regulation consistent with the time required to allow for technology development and commercialization?**

A4a. Today, the Department's Fossil Energy Clean Coal Program has the resources necessary to maintain a diversified advanced power systems and carbon capture and storage (CCS) research and development technology portfolio in order to achieve the cost, performance and environmental goals consistent with those outlined in the CURC road map. The new proposal for Carbon Pollution Standards for New Power Plants issued on September 20, 2013, is consistent with this research, which is focused on developing technology options that dramatically lower the cost of capturing carbon dioxide from fossil fueled energy plants.



**Department of Energy**  
Washington, DC 20585

September 27, 2013

The Honorable Ron Wyden  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On July 16, 2013, Adam Sieminski, Administrator, Energy Information Administration, testified regarding the exploration of how U.S. gasoline and fuel prices are being affected by the current boom in domestic oil production and the restructuring of the U.S. refining industry and distribution system.

Enclosed are the answers to 13 questions that were submitted by Ranking Member Murkowski, Senators Udall, Risch, Manchin and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis", is positioned above the typed name.

Christopher E. Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Lisa Murkowski, Ranking Member





## QUESTIONS FROM CHAIRMAN WYDEN

**Q1.** In 2007, in Sec. 804 of the Energy Independence and Security Act (P.L. 110-140), Congress directed EIA to track refinery outages and flag those that would have a significant impact on supply. In 2011, before you arrived, EIA stopped tracking refinery outages. In your testimony before the Committee, you stated that it would cost millions of dollars to reinstate the refinery outage reporting requirement. Please provide an explanation of that estimate and itemize the activities, personnel, and other costs that would be involved in reinstating a program to track refinery outages as outlined in the Sec. 804.

**A1.** Section 804 of the Energy Independence and Security Act directed EIA to track planned refinery outages using data from commercial reporting services. EIA produced the report until May 2011. A major budget reduction enacted midway through fiscal year 2011 led then EIA Administrator Newell to reduce or discontinue a wide range of EIA products.<sup>1</sup> With regard to the semiannual refinery outage report, I understand that the decision was based on the limited value of the report during the cycles in which it was prepared given its exclusive focus on planned outages using commercially available data.

Recognizing the current need for high-quality information on refinery operations in general and refinery outages in particular and its past experience with reporting on planned refinery outages based on commercially available data, EIA is now engaged in developing surveys and other activities that would lead to the tracking of both planned and unplanned refinery outages. Accomplishing this and other necessary work will require some significant alterations in EIA's operations. Specifically, EIA's data collection systems require modernization due to outdated systems and fundamental changes in energy activity. . EIA's oil data operations are undergoing wholesale changes

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<sup>1</sup>An overview of actions under the 2011 budget reductions are described in EIA's press release, *Immediate Reductions in EIA's Energy Data and Analysis Programs Necessitated by FY 2011 Funding Cut*, dated April 28 2011. <http://www.eia.gov/pressroom/releases/press362.cfm>

in order to address the most troubling of these concerns, as opposed to worsening the situation by continuing the 'make do' approach of the past.

While this work proceeds we anticipate that EIA would maintain vigilance regarding petroleum markets using existing EIA data, third-party data sources as may be readily accessible, analyzing current market conditions and proactively communicating issues of concern regarding those markets through *Today in Energy*, *This Week in Petroleum (TWIP)*, and the *Short Term Energy Outlook*. This approach provides flexibility through maintaining situational awareness of all energy sectors that extends beyond petroleum refinery outages.

The Department of Energy's budget request for EIA for FY14 includes additional resources in several key areas critical to developing the market insights requested. Specifically, the request includes an additional \$2.6 million for energy supply surveys covering all fuels, roughly one-quarter of which would be for the Weekly Petroleum Status Report (WPSR) that each Wednesday provides petroleum supply information through the end of the prior week, \$0.5 million to conduct analysis on refining and gasoline markets and expand efforts to better understand linkages between physical energy markets and financial market activity, and \$1.9 million for energy modeling and analysis, a significant portion of which would be focused on petroleum-related issues.

- Q2.** Are any statutory changes to Sec. 804 required for EIA to carry out an effective program or does EIA have sufficient authority under Sec. 804 and its underlying organic authority pursuant to the Department of Energy Organization Act (P.L. 95-91)? For example, Sec. 804 requires EIA to use commercially available sources. Does EIA have authority to obtain information on outages directly from refiners under the Department of Energy Organization Act?

**A2.** As discussed in the answer to the previous question, EIA does not believe that semiannual reports focused exclusively on planned refinery outages based on commercially available data, as directed in Section 804 of the Energy Independence and Security Act of 2007 have proven to be very useful information.

As your question suggests, EIA has broad organic authority for energy data collection. Specifically, the Department of Energy Organization Act provides the authority to collect data "relevant to the adequacy of energy resources to meet demands in the near and longer term future for the Nation's economic and social needs." 42 U.S.C. § 7135 (a)(2). EIA believes that this authority would cover collection of information on outages directly from refiners. As indicated in our response to your first question we have recently initiated the development of surveys and forms to collect outage data.

**Q3.** Your testimony before the Committee is that U.S. oil prices are set in the global market, but that hasn't been the case for most of the past two years. According to a recent Wall Street Journal article (U.S. Oil Prices: Don't Call It a Comeback, July 11, 2013), WTI has been trading at an average discount to Brent of over \$16 a barrel. The WTI/Brent spread has been reported upon numerous times by EIA itself. If U.S. crude prices were truly set in the global market there wouldn't be a significant difference between the U.S. benchmark and the major international benchmark. How do you explain the large differential between the benchmark prices and your view that U.S. prices are set in a global market?

**A3.** U.S. crude oil prices reflect worldwide supply and demand conditions and like other crude oil streams they reflect the quality characteristics and specific transportation logistics that affect the cost of moving crude oil to refining centers and its value to the refiner in producing highly-valued products. Crude oil prices are quoted for a specific grade of crude oil at a specific location WTI prices are quotes for a light sweet grade of crude delivered at Cushing, Oklahoma. For many years, only a minimal differential existed between the price of WTI and Brent crude, which is similar in quality to WTI and had a similar cost of

transportation from the location where prices were quoted (Cushing for WTI, Sullom Voe in Scotland for Brent) to the U.S. Gulf Coast, the nation's major refining center where both WTI crude and comparable seaborne crudes such as Brent were processed.

This historically small spread between WTI and Brent prices, however, began changing in 2009 due to the rapid growth in domestic crude production. This growth overwhelmed the pipeline logistics system used to transport WTI crude to Gulf Coast refineries. It therefore became necessary to transport the incremental portion of this crude by much more expensive methods, such as barge, truck, or rail. A refiner on the Gulf Coast, however, still had the option to substitute Brent crude for WTI based on its delivered cost. In order for Gulf Coast refiners to use WTI transported by the more expensive methods, its price at Cushing needed to be discounted relative to Brent by an amount sufficient to offset the higher transportation costs of moving the incremental supply at Cushing to the Gulf Coast. Competition with international crudes therefore forced the price of WTI as quoted in Cushing to decline by the increased costs of delivering it to the Gulf Coast.

As new infrastructure is added, we would expect these crude differentials to decline. Recent data indicate that some constraints that have previously depressed WTI crude prices compared to Brent crude prices have been relieved, which has resulted in a reduced WTI to Brent crude price differential. This has happened as terminals capable of handling unit trains have been added to allow expanded and more efficient shipments of crude oil via rail and some crude and some pipeline flows have been reversed and expanded. Prices for crude oil will continue to reflect global supply and demand forces subject to logistical and

quality differentials that can cause spreads between the prices of individual crude streams to widen or narrow over time.

## **QUESTIONS FROM RANKING MEMBER MURKOWSKI**

**Q1. U.S. Resource Base** – Please summarize any revisions that EIA has made to the United States' projected, technically-recoverable oil and natural gas resource base over the past decade.

**A1.** Technically recoverable resources represent the volumes of oil and natural gas that could be produced with current technology, regardless of oil and natural gas prices and production costs. Economically recoverable resources are resources that can be profitably produced under current market conditions.

Even though over 250 trillion cubic feet of dry natural gas were produced in the United States between January 1, 1998<sup>2</sup> and January 1, 2011, natural gas reserves and resources have generally been increasing, primarily due to the growth in shale gas reserves and resources. In the *Annual Energy Outlook 2013* (AEO2013), the estimated sum of total proved natural gas reserves and unproved technically recoverable resources equaled 2,327 trillion cubic feet as of January 1, 2011. Of that total, proved shale gas reserves equaled 94 trillion cubic feet and unproved shale gas resources equaled 543 trillion cubic feet for a total shale gas resource of 637 trillion cubic feet. Shale gas resources constitute 27 percent of total U.S. natural gas resources, with the remaining 1,690 trillion cubic feet of natural gas resources distributed among the conventional, tight (low permeability), and coalbed methane resources.

Prior to the advent of widespread shale gas drilling and production, the AEO2000 estimated total natural gas resources of 1,597 trillion cubic feet as of January 1, 1998. In the AEO2000, shale gas resources constituted 52 trillion cubic feet, which was only 3

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<sup>2</sup> Reserves and resources in the AEO have a two year lag, for example AEO2000 reserves and resources were as of January 1, 1998 and AEO2013 reserves and resources were as of January 1, 2011.

percent of total natural gas resources, and thus shale gas resources grew 1,125 percent between AEO2000 and AEO2013. Even though the growth in natural gas resources is largely due to the growth in shale gas resources, conventional, tight, and coalbed methane natural gas resources grew from 1,545 trillion cubic feet in the AEO2000 to 1,690 trillion cubic feet in the AEO2013, a 9 percent increase.

EIA's estimate of the sum of U.S. proved crude oil resources plus unproved technically recoverable crude oil resources has increased from 140 billion barrels in the AEO2000 to 223 billion barrels in the AEO2013, even though over 26 billion barrels of oil were produced over that timeframe. It is more difficult to make direct comparisons across the AEO oil categories because some of the oil reserves and resources have been reclassified as being low-permeability "tight" oil resources. "Tight oil" refers to oil resources located in low-permeability sandstone, carbonate, and shale formations. The application of hydraulic fracturing and horizontal drilling to these tight oil formations has significantly expanded oil resources by making these formations economically productive under prevailing oil prices. Rising oil prices have also contributed to rising proved reserves. In the AEO2013, tight oil unproved resources account for 58 billion barrels or 26 percent of total oil resources.

Even though the AEO oil resources by category cannot be directly compared over time, AEO2013 proved oil reserves increased by 1.3 billion barrels over the AEO2000 estimate, a 5 percent increase, and including the 26 billion barrels of cumulative production this is a 115 percent increase. In addition AEO2013 unproved, undiscovered oil resources increased by 81.4 billion barrels, a 70 percent increase over the AEO2000 estimate.

The AEO2012 and AEO2013 both contain more detailed discussions of revisions to resource estimates for specific shale gas and tight oil plays and discussions of the inherent uncertainties in resource estimates. Please refer to pages 56 through 64 in AEO2012 and pages 33 and 34 of AEO2013. The Assumptions reports for the Oil and Gas Supply Module for each AEO also provide details about specific changes in resource estimates.

**Q2. Transporting Crude Oil** – How do the transportation options for crude oil (including pipeline, rail, and barge) vary in terms of cost? Is there a specific mode that industry appears to prefer?

**A2.** From 2005 to 2010, 96 percent of refinery crude oil receipts came by pipeline and tanker (ship). With relatively low cost and high capacity, pipelines have long been the delivery method of choice for inland refineries. Coastal refineries, on the other hand, have typically been served by tankers of waterborne imports or offshore production. This began to change in 2011 and by 2012, pipeline and tanker deliveries accounted for 93% of the total with the remainder being deliveries of domestic crude via barge, rail, and truck. Truck and rail movements accounted for 3 percent of the total and barge receipts for 3 percent. We believe the increase in barge movements may be explained, at least in part, by crude loaded on rail cars at production areas and then transferred to barges for the final leg of delivery to refineries on the East Coast and along the Mississippi River.

The cost of transporting crude via any of the above methods varies widely depending on the distance traveled, the type of crude being transported, and the terrain over the transport distance, and other factors. EIA cannot accurately provide such cost data at this time.

**Q3. Increasing Gasoline Prices** – Many recent news stories have suggested that last week's increase in gasoline prices will continue in the weeks ahead. In EIA's estimation, what are the various factors that are combining to push prices higher?



**A3.** While the pump price of gasoline is influenced by a variety of factors, including changes in fuel specifications and fuel taxes, the major long-run determinant of gasoline prices is the global price of crude oil. In the last 10 years, the average price for gasoline in the U.S. has risen a little over \$2 per gallon, while the price of Brent crude oil, the international benchmark for waterborne light sweet crude oil has gone up \$1.87 per gallon. Over shorter time horizons, other factors that influence the price of gasoline include refinery operations, seasonal demand patterns, inventory levels, financial market activity, and distribution operations.

For the week ending July 22, 2013, the average price in the U.S. for regular grade gasoline was \$3.68 per gallon. This was an increase of almost 19 cents per gallon from July 1 as compared to a 13 cent per gallon increase in the price of Brent crude oil during the same time period. Since June, average gasoline prices are up by 4 cents per gallon while Brent crude prices have increased by 15 cents per gallon. While the direction of both crude and gasoline prices are uncertain at this time, we are aware of the increased tensions in the Middle East, which are being monitored closely by the international crude markets.

**Q4. Spare Capacity** – How has global spare capacity for oil production changed over the past five years? Has this change had a stabilizing influence on world oil prices?

**A4.** Global spare production capacity for crude oil has varied greatly over the last five years.

EIA estimates that spare capacity reached a low point of just below 1 million barrels per day at the beginning of this time frame, in the third quarter of 2008, amidst the all-time highest recorded prices for the Brent and WTI crude oil benchmarks. EIA estimates that the highest spare production capacity in the last five years was in the fourth quarter of 2009, when it reached 4.4 million barrels per day during the recovery from the financial

crisis earlier that year. Spare production capacity generally declined from that point until the third quarter of 2012. EIA estimates that current global crude oil spare production capacity is about 2.2 million barrels per day.

In general, higher crude oil spare production capacity is associated with lower crude oil price volatility but there are many other factors that can affect price stability, such as uncertainty over future economic growth as well as supply disruptions. Anticipated spare capacity is another consideration. With growth in production by non-OPEC producers, including the United States, expected to exceed growth in global oil demand during 2013 and 2014, global spare capacity is expected to increase over the next 18 months in the absence of major supply disruptions or unexpected demand growth. The outlook for growth in spare capacity together with a moderate outlook for global economic growth has likely contributed to recent relative stability in crude oil prices

**Q5. Production/Volatility** – I noted in my opening statement that a recent *Wall Street Journal* analysis found rising American oil production has reduced volatility in world oil prices. Do you agree that American oil production had a positive impact in minimizing crude price volatility?

**A5.** Rising crude oil production in the United States has helped moderate prices over the last two years. For example, domestic crude oil production was 850,000 barrels per day higher in 2012 compared to 2011, largely due to the dramatic growth in tight oil that has only recently been recognized as an economically attractive resource. Increased U.S. production was roughly equal to the total growth in non-OPEC crude oil production in 2012, a year in which global spare production capacity was relatively tight given the effect of sanctions on Iran and production disruptions in countries including Sudan, South

Sudan, and Syria. Absent the 2012 increase in U.S. production, already-low global spare capacity in 2012 would have been nearly cut in half, creating a significant prospect for world oil prices well above the levels that were actually realized.

- Q6.** In your testimony, you briefly discuss the impacts of unplanned refinery outages on gasoline prices and describe price impacts as “relatively short-lived.”
- a. In your experience, when unplanned outages occur, causing gas prices to increase, how long do these price spikes last? In your opinion, is there anything that can be done to address this issue?
  - b. In your experience, do planned outages – referred to as “turnarounds” – have similar impacts on gas prices?

- A6.** When a turnaround exceeds its planned timing or when a refinery outage occurs unexpectedly, the effect on petroleum product supplies and pricing can at times be significant, but usually not long-lasting. All areas of the country can be supplied with petroleum products from alternate refining centers, but such supplies often take some time to arrange and transport and are likely more costly than products from the usual supply sources that were disrupted. While no two outages are exactly the same, we have analyzed four such events that occurred on the West Coast between 2008 and 2012 and found that the price effects lasted from 6 to 10 weeks with an average of about 8 weeks in duration. The recent supply incident in the Midwest lasted approximately 10 weeks. As unplanned outages, these incidents are by their nature unpredictable such that little can be done to prevent them.

Major refinery units are generally taken out of service after 3-5 years of operation for repairs and routine maintenance. These planned activities, known as turnarounds, are planned years in advance in order to have equipment ordered and delivered and to schedule thousands of temporary workers, some of them highly skilled, for the work. For these

periods of planned maintenance, refiners typically arrange for product supply to meet their contracted supply obligations. Resupply strategies include arranging for product to be supplied by other refineries in the area through exchange or purchase or through inventory builds prior to the turnaround. Also, these turnarounds are generally scheduled to occur when product demand is at a seasonally low level. For these reasons, turnarounds that do not exceed their planned time frame generally do not materially affect petroleum product supplies and prices.

## **QUESTION FROM SENATOR UDALL**

- Q1.** As the United States oil industry and market are undergoing a major transformation, what impact do these shifting dynamics have on the global oil market and – particularly – on our most important international allies?
- A1.** The most important changes occurring in the U.S. oil industry are increasing domestic production of crude oil and increasing levels of petroleum product exports from U.S. refineries.

Domestic crude oil production in the United States has increased significantly over the past three years, reaching 7.4 million barrels per day as of April 2013, the highest level since October 1992. As a result, U.S. imports of crude oil from sources such as Africa, Latin America, and the Middle East during this period have declined. At the same time, imports from Canada have increased.

In 2012, the U.S. exported some 2.7 million barrels per day of finished petroleum products and gasoline blendstocks, up from 1.3 million barrels per day in 2007. Of this 1.4 million barrels per day increase, about 52% (740,000 barrels per day) is diesel fuel and about 25% (360,000 barrels per day) is gasoline and gasoline blendstocks. At the same time, U.S. imports of gasoline, gasoline blendstocks, and diesel have declined by over 670,000 barrels per day. With declining demand for petroleum products in the United States due to fuel efficiency gains and increased use of biofuels, U.S. refineries increasingly depend on product exports to maintain high operating rates and profitability. The extent to which exports can grow depends on demand growth in the international market, the competitive position of U.S. refineries to serve those markets, and domestic demand. Wholesale gasoline and diesel will continue to reflect conditions in global markets, with both import

and export opportunities dictated by differences in prices between regional market centers such as New York Harbor, Rotterdam, the U.S. Gulf Coast, Los Angeles, and Singapore that are large enough to make international shipments of products profitable. Such shipments generally continue to the point where regional product prices align so that opportunities for profitable arbitrage are eliminated.

## **QUESTION FROM SENATOR RISCH**

**Q1. Please give us your thoughts on the unfairness and the unintended consequences of the Renewable Fuel Standard and what suggestions do you have for changes that will correct this problem?**

**A1. My June 26, 2013, testimony before the Subcommittee on Energy and Power of the House Energy and Commerce Committee outlines EIA's views regarding the Renewable Fuel Standard (RFS) program. While I would refer you to the testimony for a complete perspective, four of its main points are briefly summarized below.**

**First, the RFS program is not projected to come close to achievement of the legislated target of 36 billion gallons of renewable motor fuels use by 2022. This is not a new finding – all of EIA's Annual Energy Outlook (AEO) Reference case projections since the targets were enacted in 2007 have indicated that EPA would need to apply the law's flexibility to reduce requirements for cellulosic, advanced, and total biofuels.**

**Second, substantial increases in biofuels can only occur in forms other than the low-percentage blends of ethanol and biodiesel that account for nearly all of their current use. Of the potential alternative pathways (1) increased use of higher ethanol blends, (2) the advent of drop-in biofuels, or (3) the development of compatible renewable fuel components, such as biobutanol. So far, none have achieved a significant market role.**

**Third, the implicit premise that cellulosic and other advanced biofuels would be available in significant quantities at reasonable costs within 5 to 10 years following adoption of the**

2007 RFS targets has not been borne out. The AEO Reference case projections do not assume breakthroughs in transformational biofuels technologies

EIA has not yet been able to discern an impact on gasoline prices due to the large increase in RIN prices in the first quarter of this year. While the cost of refined gasoline blendstock can be affected by high RIN prices, the increased cost to gasoline blenders is almost exactly offset by their increased revenue generated from the sales of RINs that are separated when ethanol is blended into gasoline. Going forward, EIA would expect that efforts to achieve the escalating targets for biofuels use specified in the RFS legislation would likely cause gasoline prices to increase relative to their level in the absence of an escalating RFS mandate. The actual outcomes will likely depend on the extent to the Environmental Protection Agency exercises its legal authority under the RFS statute to set standards for cellulosic, advanced, and total biofuels below the legislatively specified target levels.



## **QUESTIONS FROM SENATOR MANCHIN**

- Q1.** Can you comment on how converting vehicles to use natural gas as a fuel – to supplant either diesel or gasoline – might impact our finished product exports? I would guess that we'd export more products and it'd be good for our trade balance, but it could also result in refineries shutting down. What are your thoughts on this matter?
- A1.** In EIA's *Annual Energy Outlook 2013* natural gas use in vehicles, including both the direct use of natural gas in vehicles—i.e. liquefied natural gas used in heavy duty vehicles—and the indirect use of natural gas as liquids from a gas-to-liquids process, reaches 1.7 trillion cubic feet by 2040, displacing 0.7 million barrels per day of other motor fuels, principally diesel fuel. Over the same period, diesel fuel consumption increases by 0.8 million barrels per day, primarily for use in heavy duty vehicles, offsetting the displacement diesel fuel by natural gas. As a result, EIA does not expect the increased use of natural gas as a motor vehicle fuel to result in refinery shutdowns. Even if higher amounts of traditional petroleum fuels were displaced by increased natural gas use, the ability to export petroleum products could avoid the need to close refineries as long as they remained competitive in the global markets.
- Q2.** Can you comment on how a technology like advanced EOR can extend the life of our oil fields? Or discuss other research areas that can help us get the most bang for our buck from these fields, and keep the oil flowing?
- A2.** Technology development within the oil and natural gas industry is an ongoing process involving both the Federal laboratories and the research and development activities undertaken by oil and natural gas production and service companies. Almost all of the current EOR production results from the injection of either steam or carbon dioxide (CO<sub>2</sub>) to improve oil field recovery rates.

The greatest current constraint to higher CO<sub>2</sub> EOR production is the lack of affordable CO<sub>2</sub> supply. If more CO<sub>2</sub> supply were available to oil producers at affordable prices, then CO<sub>2</sub> EOR investment and oil production could increase significantly. Both the Department of Energy laboratories and private industry are devoting substantial research dollars to develop more efficient and economic technologies to capture and concentrate CO<sub>2</sub> from fossil fuel combustion flue gases at electric power plants and at industrial manufacturing facilities. This research and development could have a great impact on increasing future oil production if it removes current constraints on CO<sub>2</sub> supply and makes significant new sources of CO<sub>2</sub> available to oil producers at affordable prices.

Two other areas of current EOR research also merit attention. The first of these is focused on supplementing steam and CO<sub>2</sub> EOR injection with the co-injection of chemical surfactants to further reduce oil viscosity, thereby further enabling the movement of oil to production wells. This research is still at an early stage and will require considerably more research and testing before it could be widely implemented.

Another avenue of steam and CO<sub>2</sub> EOR research is the better monitoring and characterization of the movement of fluids through oil reservoirs so that the bypassed oil in the reservoir can be produced. Better monitoring could be achieved with the better and less expensive downhole instrumentation and surface seismic equipment. Research efforts are underway to reduce the cost of downhole instrumentation and seismic equipment so that that they can be used more widely and frequently. The better characterization of fluids movement through the reservoir is being achieved through the research and development of

**better reservoir simulator software that show how to increase and optimize the movement of fluids through the reservoir.**



**Department of Energy**  
Washington, DC 20585

October 22, 2013

The Honorable Tim Murphy  
Chairman  
Subcommittee on Oversight and Investigations  
Committee on Energy and Commerce  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On July 24, 2013, Daniel B. Poneman, Deputy Secretary, testified regarding "Department of Energy Oversight: What is Necessary to Improve Project Management and Mission Performance?"

Enclosed are the answers to 14 questions that were submitted by Representative Butterfield and you.

Also, the three Inserts for the Record that were requested by Representative Johnson and you, are enclosed to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis", is positioned above the printed name.

Christopher E. Davis  
Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Diana DeGette, Ranking Member



## QUESTIONS FROM REPRESENTATIVE TIM MURPHY

**Q1. The White House announced it would nominate NASA chief financial officer Beth Robinson for the newly created position of Under Secretary for Management and Performance to oversee DOE contracts. A Washington Times article from July 23, 2013 detailed how cost overruns at NASA grew six-fold during Ms. Robinson's tenure. In light of this news report, what assurances can you provide that the new Undersecretary for Management and Performance will be able to manage DOE spending on contracts effectively?**

**A1.** Dr. Robinson has extensive experience in procurement and project management, including experience and insight from her time at NASA. The Department of Energy has improved the effectiveness and efficiency of the Department's mission support functions and the management of major capital projects and contracts and will continue to do so under Elizabeth Robinson's leadership if she is confirmed as Under Secretary for Management and Performance. Reducing the cost of doing business within the Department and improving project management will enable us to reallocate resources toward our mission objectives in national security, science and energy.

## QUESTIONS FROM REPRESENTATIVE TIM MURPHY

- Q2. Renewables such as wind and solar account for less than 4% of power, but received almost a billion dollars in direct research money. At the same time, the Administration proposed spending much less than half that amount on clean fossil fuel technologies even though fossil energy produces more than 80% of the power in the United States. Under Secretary Moniz, will fossil energy research and development still remain a priority for and the Department of Energy?**
- A2. Fossil energy research and development is a priority for the Department of Energy. As Dr. Moniz stated, in his July 30 visit to the National Energy Technology Laboratory this year, "We are about preparing our future so that all of our fuels have an important role." To support this, the Administration has committed nearly \$6 billion to clean coal technologies, including carbon capture and sequestration and is preparing to issue an \$8 billion loan guarantee solicitation for advanced fossil energy technologies.**

## QUESTIONS FROM REPRESENTATIVE TIM MURPHY

**Q3. Please describe the research into carbon capture sequestration and clean coal technologies DOE conducts through the National Energy Technology Laboratory and what plans DOE has for continuing or increasing research on this front?**

**A3.** DOE's research and development portfolio includes a diverse set of technologies and pathways that are focused on capturing CO<sub>2</sub> emissions and storing them permanently or utilizing them in a beneficial manner, and developing advanced technologies to more efficiently and cleanly burn fossil fuels for power generation while facilitating carbon capture and storage. These technologies include post-, pre-, and oxy-combustion carbon capture; carbon storage development such as small- and large-scale injection tests, monitoring technologies, simulation and risk assessment tools, and carbon utilization options; gasification, turbines, and fuel cells for advanced power generation; and crosscutting activities such as computational modeling and materials development. The National Energy Technology Laboratory's (NETL) scientists and engineers conduct research in each of these areas to support programmatic goals and objectives while also conducting cutting edge R&D that identifies new opportunities and technologies to utilize our nation's fossil energy resources cleanly, efficiently, and in a cost-effective manner. DOE plans to continue R&D in these areas as part of the President's "all of the above" energy strategy as well as the Climate Action Plan.

## QUESTIONS FROM REPRESENTATIVE TIM MURPHY

**Q4. Please provide an update on the progress of contracts awarded through the Research Partnership to Secure Energy for America (RPSEA), as well as the financial report for RPSEA in FY2012, including but not limited to overhead and operational expenses.**

A.4 Over the past six years (2007 – present), over 150 projects have been awarded, 69 of which have been completed, and 81 are still active. RPSEA is currently reviewing proposals submitted in response to the 2012 Unconventional Resources Program request for proposals (RFP) and the 2012 Small Producers Program RFP. Selections are anticipated to be made in early October. RPSEA also has two 2012 Ultra-Deepwater Program RFPs open soliciting proposals for 17 technical areas. Selections from those RFPs are anticipated to be made in December/January.

Pursuant to the Energy Policy Act of 2005, a total of \$35.625 million was obligated to the RPSEA contract in FY12, of which \$3.75 million was for administrative/programmatic activities, and \$31.875 million for research activities. RPSEA received \$1 million of the \$3.75 million for administrative activities in December 2011, and received the remaining \$2.75 million on June 5, 2012. These funds were expended by RPSEA from January 2012 through January 2013. The FY12 research funds totaling \$31.875 million were obligated to the RPSEA contract on September 5, 2012. These funds have all been obligated to research subcontracts by RPSEA.



## QUESTIONS FROM REPRESENTATIVE TIM MURPHY

**Q5. Please describe in detail the Department's participation in the interagency process(es) to develop social cost of carbon estimates, including when the process(es) were initiated, who was involved and who managed the process both at DOE and for the interagency group, and what records did DOE maintain to memorialize process deliberation and participation?**

A5. Staff at DOE provided technical input to the Interagency Working Group on the Social Cost of Carbon. The technical update to prior SCC estimates was conducted in order to ensure that DOE and other agencies incorporate the best available peer-reviewed information in evaluating the cost and benefits of rulemakings. For more information about this process, please refer to OIRA Administrator Howard Shelanski's July 18, 2012 testimony in front of the House Oversight and Government Reform Committee's Subcommittee on Energy Policy, Healthcare and Entitlements.

## QUESTIONS FROM REPRESENTATIVE TIM MURPHY

**Q6. During the hearing, you described mission support offices under the proposed restructuring, and noted that the Chief Financial Officer was not part of the new structure, but "above the fray, so to speak."**

- a. Does the CFO office have more mission support authority than the management office or the CIO, for example, under the new structure?**
- b. What authority do these mission support offices have to tell program offices what to do when those offices operate under the authority of another Under Secretary?**
- c. Explain why this does not create management problems by stove-piping or siloing certain mission support functions within DOE's management structure?**

**A6a.** The Office of the Chief Financial Officer works closely with the Office of the Under Secretary for Management and Performance and the other mission support functions of the Department on the full range of administrative and management issues, particularly insofar as there are budget and financial issues involved. The Office of the Chief Financial Officer's authority is not "more" or "less" than the other management offices, but rather focused on the particular areas of responsibility of the Chief Financial Officer function.

**A6b.** The Deputy Secretary remains the Chief Operating Officer of the Department. We fully anticipate that program offices across the Department, as well as the Offices of Under Secretary for Science and Energy and Under Secretary for National Nuclear Security Administration, will work with the Office of the Under Secretary for Management and Performance and the Office of the Deputy Secretary on the broad range of policy and implementation issues related to the mission support functions of the Department. The

Secretary and the Deputy Secretary retain the authority to establish department-wide policies and direct the implementation as necessary.

- A6c. Rather than stovepiping the mission functions, the reorganization creates a structure in which all the mission support organizations are unified under the Office of the Under Secretary for Management and Performance and can cooperate and work together.

## QUESTIONS FROM REPRESENTATIVE TIM MURPHY

**Q7. The Secretary is ultimately responsible and accountable for the various missions of the Department. Because of this, does it benefit the Secretary to have staff for certain department-wide functions to provide his eyes and ears (and voice) to ensure he can manage the department's various missions?**

**a. In the Department of Defense there is a management structure called functional component, through which the office of the Secretary's mission support functions -- the CFO, CIO, Human Resources -- communicate with their functional equivalents in the various Defense Department components. Would DOE benefit from such a management approach across the agency, including the NNSA?**

**b. What are the limits or barriers to implementing such an approach?**

**A7a. The mission support functions within Office of the Under Secretary for Management and Performance communicate and work on a regular basis with comparable components within DOE program offices, including the NNSA.**

**A7b. The NNSA Act limits the authority of non-NNSA personnel, including the mission support functions, to direct or exercise authority with regard to the NNSA. The NNSA Act does not, however, limit the ability of the mission support functions to work with the Secretary to establish policies that the Secretary has the authority to establish throughout the Department. The non-NNSA mission support functions communicate with their NNSA counterparts as these policies are developed and on a regular basis on the implementation of these policies and other matters.**

## QUESTIONS FROM REPRESENTATIVE TIM MURPHY

**Q8. To the extent program management of the national laboratories is the responsibility of different DOE offices, how do you ensure such management and oversight is performed consistently across DOE?**

- a. What office is responsible for ensuring consistent management attention to the lab contracts and contractors?**
- b. What will be the function of National Laboratory Operations Board and what role, if any, will this entity have concerning the development of consistent metrics for judging laboratory performance?**

**A8. The National Laboratory Operations Board will report to the Office of the Under Secretary for Management and Performance and will include representatives from all of the program offices that oversee one or more of the national laboratories. Those program offices will continue to have the primary responsibility for the program direction and oversight of the laboratories. The National Laboratory Policy Council will serve to coordinate and develop consistent policies with regard to the Department of Energy's management of the laboratories. The National Laboratory Operations Board enables the Department to address administrative and operational issues affecting the laboratory system in a coordinated manner using an enterprise-wide approach. The development of consistent metrics for evaluating laboratory performance is a challenge that may be addressed at a policy level by the National Laboratory Policy Council and at an administrative level by the National Laboratory Operating Board.**

## QUESTIONS FROM REPRESENTATIVE TIM MURPHY

**Q9. In a January 2010 report, the Government Accountability Office recommended that, to better ensure DOE is able to develop high-quality project cost estimates, the Secretary of Energy should issue the department's cost-estimating policy and updated guidance of as soon as possible, and ensure that the policy requires that independent cost estimates (ICEs) be conducted for major projects at critical decision (CD) milestones CD-I, CD-2, and CD-3.**

**a. Explain whether DOE has issued a cost-estimating policy, whether it is standardized across the DOE enterprise, when it was issued, and whether ICEs have been or will be conducted at milestones CD-1, CD-2, and CD-3?**

**A9. DOE Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*, released on November 29, 2010, established cost estimating requirements for Independent Cost Reviews (ICRs) and Independent Cost Estimates (ICEs) at each of the Department's Critical Decision (CD) milestones for acquisition of capital assets across the Department, inclusive of the National Nuclear Security Administration. On May 9, 2011, the Department issued DOE Guide 413.3-21, *Cost Estimating Guide*, which establishes best practices for developing cost estimates by the contractors and project teams. Its purpose is to provide uniform guidance and best practices that describe the methods and procedures recommended for use at DOE in preparing cost estimates across all phases of the Department's capital asset acquisition process. DOE Order 413.3B and DOE Guide 413.3-21 are consistent with, and adopt observations, recommendations, guidance and best practices from GAO audit reports and GAO's *Cost Estimating and Assessment Guide* (e.g., the Twelve Steps of a High Quality Cost Estimating Process).**

DOE Order 413.3B, in conjunction with P.L. 112-74 FY2012 Consolidated Appropriations Act, requires DOE's Office of Acquisition and Project Management to

conduct for capital asset projects with a cost of \$100M or greater an ICE or ICR at CD-1, Approve Alternative Selection and Cost Range, an ICE at CD-2, Approve Performance Baseline, and, an ICE at CD-3, Approve Start of Construction/Execution. ICEs have been conducted on a number of capital asset projects to include the National Nuclear Security Administration's Uranium Capability Replacement Project, the Office of Environmental Management's Salt Waste Processing Facility, and the Office of Science's **Linac Coherent Light Source II (LCLS II) Project.**

## QUESTIONS FROM REPRESENTATIVE TIM MURPHY

**Q10. Explain how DOE works with the U.S. Army Corp of Engineers (USACE) to conduct of independent cost reviews and estimates, and what if any barriers there are to increased use of USACE expertise to enhance DOE project oversight and management. In addition, what are DOE's plans to increase use of USACE independent cost estimating?**

A10. The DOE Office of Acquisition and Project Management (OAPM) has retained the US Army Corps of Engineers (USACE) and its cost estimating contractors to augment OAPM capabilities when appropriate for complex DOE nuclear processing plant projects. To mitigate potential barriers, OAPM and USACE signed a memorandum of understanding in 2012 to define this partnership. OAPM, which is responsible for conducting Independent Cost Reviews (ICRs) and Independent Cost Estimates (ICEs) within DOE, is comprised of a professional staff of engineers with extensive project management experience who are also accredited as Certified Cost Professionals by the Association for the Advancement of Cost Engineering International (AACEI). As a result, OAPM is fully capable of conducting credible and high-quality ICEs and ICRs augmented on an as-needed basis with cost estimators, schedulers, risk management specialists, and other subject matter experts obtained from OAPM contractors or USACE contractors (many of which are the same as the OAPM contractors).



## QUESTIONS FROM REPRESENTATIVE G.K. BUTTERFIELD

**Q1. We've seen a consistent and concerted effort to reduce discretionary non-defense spending, even at the detriment to agency missions and our constituents. Sequestration has negatively affected many agencies but significantly and indiscriminately cutting important, mission critical funding. How has sequester impacted the Department of Energy's ability to achieve its four mission areas of nuclear security, solving the Nation's energy challenges, advancing fundamental science, and environmental stewardship? In what ways has the sequester impacted the ability of DOE in terms of management and oversight?**

**A1. Sequestration cut nearly \$1.9 billion from the Department of Energy's FY 2013 funding level. This cut reduces the ability of the Department to carry out its work, slows down work already in progress, results in contractor workforce impacts at multiple sites, and defers grants, contracts, and hiring to support planned work.**

Over \$300 million was cut from programs supporting critical investments in scientific research and clean energy technologies, including funding for advanced computing systems, climate change research, next-generation manufacturing, fuel-efficient vehicles, renewable energy generation, advanced nuclear reactor designs, sustainable carbon capture technologies, and electric grid modernization and security. Over \$400 million was cut from environmental stewardship programs, resulting in waste retrieval and cleanup schedule delays at sites. Finally, over \$800 million was cut from the National Nuclear Security Administration programs supporting nuclear weapons stockpile stewardship, global nuclear nonproliferation activities, and submarine propulsion system design, resulting in schedule delays and potential cost overruns.

Sequestration has not had a significant impact on federal management and oversight.

## QUESTIONS FROM REPRESENTATIVE G.K. BUTTERFIELD

**Q2. Most recently, we saw drastic cuts to DOE funding in the Energy and Water appropriations bill, which passed the House with immense Democratic opposition. The bill cuts funding for FY 14 by 8 percent, and makes drastic cuts to important programs such as nuclear non-proliferation, defense-related environmental management activities, and renewable energy programs. Many of these cuts would be in areas that the GAO and Inspector General have identified need improvement, is that correct? How would these significant cuts to mission-critical programs impact the DOE's ability to make necessary improvements and fulfill the President's vision?**

**A2. The House Energy and Water Appropriations Bill (H.R. 2609) underfunds critical investments in our energy and national security. Reductions in these areas will impact and could multiply issues that the GAO and Inspector General have identified as needing improvement. If enacted, the cuts included in H.R. 2609 will impact mission critical programs and national priorities.**

The bill cuts funds that develop our American energy sources to build a clean and secure energy future and leaves US competitiveness at risk in new clean energy markets, such as advanced vehicles, advanced manufacturing, energy efficiency and domestic renewable energy. The bill reduces funding to DOE's Office of Energy Efficiency and Renewable Energy (EERE) by 73% from the request, severely limiting investments in innovative clean energy research and development and providing less weatherization assistance than needed to assist low-income households. Cuts to the Office of Electricity Delivery and Energy Reliability will slow efforts to modernize and secure the electricity grid and the ability to respond to energy emergencies. The bill reduces Advanced Research Projects

Agency-Energy (ARPA-E) funding by 87% compared to the request severely impacting funding to potentially transformative energy research. And, cuts to the Office of Science will eliminate all funding for new grants, likely lead to terminations of ongoing awards, and could reduce or cease operations at all major scientific user facilities. These reductions to DOE's science and energy programs would impact U.S. leadership in research and economic competitiveness.

Funding reductions to DOE will also impact the National Nuclear Security Administration increasing the risk of schedule delays for key components of the nation's nuclear strategy and limiting the ability for Naval Reactors to address current and emerging issues in the fleet. The bill delays the Spent Fuel Handling Recapitalization Project, potentially jeopardizing the operational availability of aircraft carriers and submarines while increasing the project's cost by \$335 million. Reductions to Weapons Activities will weaken facility operations, construction initiatives, and stockpile support activities, all of which directly support the President's nuclear strategy as expressed in the Nuclear Posture Review. If enacted, the bill will undercut DOE's ability to maintain the nuclear stockpile and cut essential national security efforts required to implement nuclear strategy and advance counter-proliferation objectives.

### QUESTIONS FROM REPRESENTATIVE G.K. BUTTERFIELD

- Q3. I applaud the Department of Energy and the President's ambitious vision for prioritizing climate change reduction and preparing our nuclear capabilities for the future. It is encouraging to see the emphasis on innovation while reorganizing to become more efficient. Under the new reorganization, there will now be a senior policy official dedicated to improving management on a full-time basis, is that correct?**
- A3. Yes. The Department of Energy has established an Under Secretary for Management and Performance to improve project management and increase the effectiveness and efficiency of our mission support functions across the Department.**
- Q4. Currently, 90 percent of the Department of Energy's budget of \$26 billion is being allocated to contractors. Will these consolidations improve oversight of contractors and help correct some of the issues raised by GAO and the IG?**
- A4. Yes. The establishment of the Under Secretary for Management and Performance will allow greater oversight of contractors and improve project management and performance across the Department.**

234  
235 having the data but making sure you have a system in place to  
236 have honest reassessments of that.

237 One other quick question in my time. In your testimony you  
238  
239 said that President laid out a commonsense plan to reduce the  
240 effects of climate change by cutting dangerous carbon pollution,  
241 as you put it, increasing the production of clean energy and  
242 doubling down on energy efficiency. I noticed the Department  
243 released a new rule for microwave oven efficiencies and included  
244 a calculation for the social cost of carbon, and I would like to  
245 know if the agency considered doing a formal notice and comment  
246 to the microwave rule before using this figure. Did anyone in  
247 your office participate in any discussions about this social  
248 cost of carbon before using it in the DOE microwave rule, and  
249 can you please submit to us emails and documents to help us  
250 understand why that was done.

251 Mr. {Poneman.} Mr. Chairman, I was present for some  
252 discussion of social costs of carbon. I was not--I would have  
253 to get back to you with details on how it related to that  
254 particular rule.

255 Mr. {Murphy.} That is something this committee is going to  
256 want to review in an open and scientific way.

257 Mr. {Poneman.} We would be very happy to supply that.

258  
259 Ms. {Castor.} Thank you, Chairman Murphy.

260  
261 It is very important and a positive sign that the

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Staff at DOE provided technical input to the Interagency Working Group on the Social Cost of Carbon. The technical update to prior SCC estimates was conducted in order to ensure that DOE and other agencies incorporate the best available scientific, technical and economic information in evaluating the cost and benefits of rulemakings. For more information about this process, please refer to OIRA Administrator Howard Shelanski's July 18, 2012 testimony in front of the House Oversight and Government Reform Committee's Subcommittee on Energy Policy, Healthcare and Entitlements.

500  
501 portfolio was strong. That said, he had a number of very  
502 important practical suggestions in terms of transparency,  
503 accountability, customer servicing, portfolio management, and  
504 many of those have been implemented, point one. Point two, that  
505 included making sure we had very highly capable people in the  
506 positions. Point three, a lot of those people are very much  
507 focused on portfolio management, and there is a brand-new leader  
508 of the loan program office, and finally, in this reorganization,  
509 Secretary Moniz wants to make sure that the Credit Review Board  
510 itself, which sits above the Credit Committee, is strengthened  
511 so that we will have the ability in the normal kind of boardroom  
512 fashion of doing due diligence on transactions to make sure we  
513 bring those kinds of disciplines to bear.

514       Mr. {Griffith.} One of my concerns there was, it appeared  
515 that the legal counsel that was being given was seeing--and this  
516 is my interpretation, nobody ever said this--saw itself as  
517 trying to come up with a legal opinion to justify what the  
518 Department of Energy wanted to do as opposed to protecting the  
519 American taxpayers, and I would hope that the legal department  
520 would see as a part of their duty at the very least is to make  
521 sure that what they are doing is lawful because the laws that  
522 Congress pass are intended to protect American taxpayers, and  
523 the decision to subordinate cost \$170 million to the American  
524 taxpayers.

525  
526       Mr. {Poneman.}   Congressman, I would have to dig back into  
527 the details to get the--I would just say my recollection of the  
528 legal advice received at the time was there was a higher chance  
529 of a higher recovery from a going concern than from a fire sale,  
530 and the question at the time that it was presented was whether  
531 subordination would meet the statutory requirement that the  
532 Secretary was obliged to seek the maximum recovery for the  
533 taxpayer. But we can obviously follow up on that.

---

534   Mr. {Griffith.}   I just wanted to know if it was still ongoing.  
535 I appreciate that. Thank you very much.

536       Back to you, Deputy Secretary. As a part of this, another  
537 issue has been brought to my attention, and I am not going to  
538 tell you I am well versed in it, but it does concern me, and  
539 that relates to the National Nuclear Security Administration and  
540 the National Security Complex and Pantex plant management  
541 contracts, and in that process, GAO has said that there was an  
542 upheld--they upheld a procurement protest. My concern on that  
543 is, is that apparently, according to a press report that has  
544 been brought to me, in three instances, the source selection  
545 authority at the 11th hour changed some of the criteria, and I  
546 know there are all these big companies jockeying for position,  
547 but at the 11th hours, three matters were changed and that  
548 changed who got the contract. On its face, that doesn't smell  
549 right to me. Are you all looking into that matter and trying to



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At the time of the restructuring, after thorough analysis, DOE concluded that the restructured terms - which would allow completion of the manufacturing facility - offered the greatest likelihood that the loan would be repaid, and was therefore in the best interests of taxpayers. Career officials in LPO, including the office's Chief Counsel, as well as attorneys in DOE's Office of General Counsel, reviewed the proposed restructuring thoroughly and concluded that it was permitted under Title XVII of EPAct, as amended, 42 U.S.C. §§ 16511-16514.

**Attachment 2-Member Requests for the Record**

**The Honorable Tim Murphy**

*During the hearing, Members asked you to provide additional information for the record, and you indicated that you would provide that information. For your convenience, descriptions of the requested information are provided below.*

- Q1. Did anyone in your office participate in any discussions about this social cost of carbon before using it in the DOE microwave rule, and can you please submit to us emails and documents to help us understand why that was done.**
- A1. Staff at DOE provided technical input to the Interagency Working Group on the Social Cost of Carbon. The technical update to prior SCC estimates was conducted in order to ensure that DOE and other agencies incorporate the best available scientific, technical and economic information in evaluating the cost and benefits of rulemakings. For more information about this process, please refer to OIRA Administrator Howard Shelanski's July 18, 2012 testimony in front of the House Oversight and Government Reform Committee's Subcommittee on Energy Policy, Healthcare and Entitlements.**

### QUESTION FROM RANKING MEMBER MURKOWSKI

Q1. Do you think that future required R&D activities-- those that could be needed to address any outstanding issues, such as waste storage and transportation issues are enabled by the proposed legislation? Do we need to be more specific about the type of R&D that DOE and/or the new administration should carry out? Also, do you think that there are any open issues that may pose a challenge to get a storage facility and/or repository sited, licensed and constructed with the current timeline?

A1. The Administration is still reviewing the draft legislation, S. 1240.

While we expect there will be challenges in implementing the program, the timeline and program laid out in the Strategy is achievable but is dependent on legislation for full deployment. In the meantime, the Administration, through the Department of Energy (DOE), is undertaking activities within existing Congressional authorization to plan for the eventual transportation, storage, and disposal of used nuclear fuel. Activities range from examining waste management system design concepts, to developing plans for consent-based siting processes, to conducting research and development on the suitability of various geologies for a repository.

### QUESTIONS FROM SENATOR HEINRICH

Q1. In a consent-based process, what would be the appropriate range of terms and conditions for a state, tribe and local community to consent to hosting a repository or an interim storage facility? For example, in addition to a package of benefits and compensation, do you think states and tribes should be given a role in the regulatory, permitting and oversight of the storage facility or repository?

A1. Promising experiences in other countries indicate that a consent-based process, developed through engagement with states, tribes, local governments, key stakeholders, and the public, offers a greater probability of success than a top down approach to siting.

Defining consent, deciding how that consent is codified, and determining whether or how it is ratified by Congress are critical first steps toward siting the storage facilities and

repository. As such, they are among the near-term activities to be undertaken by the Administration in consultation with Congress and others. The Department is currently gathering information from the siting of nuclear facilities in the U.S. and elsewhere in order to better understand critical success factors in these efforts and to facilitate the development of a future siting process for a repository and storage facilities. As part of this process the Department will consider the question of host-requested terms and conditions. The Administration looks forward to working with Congress to develop a consent-based process that is transparent, adaptive, and technically sound.

The Administration's Strategy endorses the proposition that prospective host jurisdictions must be recognized as partners. Public trust and confidence is a prerequisite to the success of the overall effort, as is a program that remains stable over many decades; therefore, public perceptions must be addressed regarding the program's ability to transport, store, and dispose of used nuclear fuel and high-level radioactive waste in a manner that is protective of the public's health, safety, and security and protective of the environment.

- Q2. The BRC's proposed consent-based process calls for a cooperative agreement for communities that host nuclear waste storage or disposal facilities. Such an agreement could include substantial financial commitments and possible regulatory roles not generally provided to states. Under such a consent-based process, would states and communities have greater confidence the government will actually meet its commitments if Congress also ratified the agreements made with the states, tribes and communities?
- A2. Promising experiences in other countries indicate that a consent-based process, developed through engagement with states, tribes, local governments, key stakeholders, and the public, offers a greater probability of success than a top down approach to siting. Defining consent, deciding how that consent is codified, and determining whether or how

it is ratified by Congress are critical first steps toward siting the storage facilities and repository. As such, they are among the near-term activities to be undertaken by the Administration in consultation with Congress and others. The Department is currently gathering information from the siting of nuclear facilities in the U.S. and elsewhere in order to better understand critical success factors in these efforts and to facilitate the development of a future siting process for a repository and storage facilities. The Administration looks forward to working with Congress to develop a consent-based process that is transparent, adaptive, and technically sound.

- Q3. In the cooperative agreement with the state, tribe and local community for an interim storage facility, should there also be an enforceable deadline with penalties for failing to remove the waste from the storage facility? How large do you think such a penalty would have to be to assure a repository was in operation in 2048 as required? What would be the source of funds for the payment of penalties?

A3. The BRC recommended that “one or more consolidated (interim) storage facilities be developed to start the orderly transfer of used nuclear fuel from reactor sites to safe and secure centralized facilities independent of the schedule for operating a permanent repository.” The Administration agrees that interim storage should be included as a critical element in the waste management system. DOE has initiated a planning project with the objective of pursuing activities that can be conducted within the constraints of the NWPA and will facilitate the development of an interim storage facility, of a geologic repository, and of the supporting transportation infrastructure, including evaluating operational options for consolidated storage and furthering the design of a generic consolidated storage facility. The Department will continue with these activities within existing Congressional authorization while the Administration and Congress work together on potential changes to the nuclear waste management program.

## QUESTIONS FROM SENATOR SCOTT

### **Plutonium Disposition**

- Q1. How can the Administration reconcile a “slowdown” to the program that could ultimately kill the MOX project, and simultaneously pledge to uphold our agreement with the Russians?
- A1. The United States remains committed to achieving the important nonproliferation mission associated with the disposition of excess weapon-grade plutonium and to our agreement with Russia. However, considering the unanticipated cost increases associated with the MOX fuel approach and the current budget environment, the Administration is conducting an analysis to determine whether there are options to complete the mission more efficiently.

### **MOX Project**

- Q2. How much will the slowdown of the MOX project affect its cost and schedule?
- A2. As mentioned in response to your first question, the United States remains committed to achieving the important nonproliferation mission associated with the disposition of excess weapon-grade plutonium and to our agreement with Russia. However, considering the unanticipated cost increases associated with the MOX fuel approach and the current budget environment, the Administration is conducting an analysis to determine whether there are options to complete the mission more efficiently. Cost and schedule impacts will be a central component in determining next steps for fulfilling our plutonium disposition commitments.
- Q3. What are NNSA’s estimates on how much it would cost to shut down the MOX project?
- A3. NNSA does not have a current estimate of the cost to shutdown the MOX project.

- Q4. How much is the study expected to cost and where will the money come from- NNSA, NE, EM or elsewhere?
- A4. The Administration is conducting an analysis of plutonium disposition options, which is being funded primarily through NNSA.
- Q5. When is the study expected to be completed?
- A5. The Department intends to use the analysis in order to inform the FY 2015 budget.
- Q6. What are the other alternatives and are they consistent with the US-Russia agreement?
- A6. The analysis includes continuing the current path of disposing of plutonium as MOX fuel as well as other technically and financially feasible options. The U.S.-Russia Plutonium Management and Disposition Agreement (PMDA) allows for other disposition paths if agreed to by both parties.
- Q7. Will the US-Russia Agreement have to be amended if the Obama Administration shuts down the MOX project to use an alternative?
- A7. The United States remains committed to achieving the important nonproliferation mission associated with the disposition of excess weapon-grade plutonium and to our agreement with Russia. The U.S.-Russia Plutonium Management and Disposition Agreement (PMDA) allows for other disposition paths if agreed to by both parties.
- Q8. What assurance do we have that Russia will be amenable to something other the MOX process?
- A8. The U.S. will continue to engage Russia while conducting the options analysis and will work to continue progress in implementing the PMDA.
- Q9. What national security assessments will be made if the MOX project is ultimately shut down?

- A9. The Department has not cancelled the MOX project, and we cannot prejudge the outcome of the options analysis.
- Q10. What options have been previously reviewed and eliminated and what has changed since the time of those studies that these same options should be considered again? What new serious options exist today that have not already been evaluated?
- A10. As previously mentioned, the United States remains committed to achieving the important nonproliferation mission associated with the disposition of excess weapon-grade plutonium and to our agreement with Russia. However, considering the unanticipated cost increases associated with the MOX fuel approach and the current budget environment, the Administration is conducting an analysis to determine whether there are options to complete the mission more efficiently. The options include continuing the current path of disposing of plutonium as MOX fuel as well as other technically and financially feasible options. Previous reviews of the Administration's plutonium disposition strategy will be taken into account in this new analysis. Some options are being analyzed that have been considered in the past; however, the new analysis will take into consideration new data and changes in the operating plans of DOE facilities.
- Q11. How does the Administration intend to comply with the agreement with the State of South Carolina for the permanent disposition or removal of plutonium in the state?
- A11. The Department understands our commitments under current legislation, and we will look to ensure compliance with the law as we analyze plutonium disposition options.
- Q12. What will be the costs of complying with the agreement with the State of South Carolina and of non-compliance?



- A12. Beginning in 2016, current law stipulates “economic assistance” in the form of fines and penalties of \$1 million per day up to \$100 million per year, subject to appropriations.
- Q13. Does the Administration have a contingency for the removal of all the plutonium in the state of South Carolina?
- A13. The Department understands the provisions of current law, and we will look to ensure compliance with the law as we analyze options.
- Q14. If the MOX project is cancelled, will NNSA remove the plutonium from SRS, and if so, to where? How much will it cost to package, transport, safeguard and store this sensitive material?
- A14. The Department understands the provisions of the current law, and we will evaluate the costs associated with meeting requirements as the path forward is determined.
- Q15. If the plutonium storage facilities at Pantex are getting full, or, as the DOE IG found earlier this year may not be able to safely hold plutonium for much longer due to the age and condition of the storage bunkers, what is NNSA’s plan for the plutonium at SRS and Pantex?
- A15. Although aged, the storage facilities at Pantex are safe and continue to be maintained by NNSA as mission critical assets. Additionally, a recent DOE IG study focused its concerns on bunkers which comprise a portion of the facilities used for plutonium storage at Pantex. As part of ongoing efforts to develop NNSA’s plutonium strategy, we are evaluating effective ways to safely store plutonium.
- Q1. How many taxpayer dollars have been spent to date on DOE’s rulemaking regarding set-top box energy conservation requirements?
- A1. To date, DOE has spent a total of approximately \$2.9 million in contract funding and approximately \$300,000 on Federal salary and benefits on the development of energy conservation standards and test procedure development for set-top boxes. This includes

the development of the test procedure that is used to measure the energy efficiency of the set-top boxes. These test procedures are necessary as a foundation to both voluntary and regulatory programs.

Q2. How many taxpayer dollars does DOE anticipate spending during the lifecycle of this rulemaking process?

A2. A typical energy conservation standards rulemaking takes about 3 years to accomplish and costs approximately \$3 to \$5 million to complete, depending on the complexity of the rulemaking being performed. DOE is still early in the rulemaking process for set-top boxes, and acknowledges that funding of the process is subject to annual appropriations.

Q3. Has DOE contracted any of this rulemaking out to third parties? How much has been spent on the contractors?

A3. Yes, DOE has contracted approximately \$2.9 million for energy conservation standards analysis and test procedure development for set-top boxes to date. The analysis was provided to industry and others and supported the voluntary agreement discussion. Test procedure development and finalization is necessary for both voluntary agreements and mandatory regulations. Contractors represent one way for DOE to access the expertise it needs to advance a rulemaking for the timeframe DOE requires that expertise.

Q4. In terms of carbon dioxide emissions savings, what percentage of the United States' total carbon dioxide emissions do you anticipate DOE's set-top box energy conservation standards will save?

A4. DOE has not proposed an energy conservation standard for set-top boxes, so it is not yet possible to estimate the carbon dioxide savings that could occur from an energy conservation standard at this time. If DOE were to propose an energy conservation

standard, the proposed rulemaking would include an estimate of the potential carbon dioxide savings.

Overall appliance and equipment standards are saving consumers significant amounts on their energy bills and helping avoid significant emissions of carbon dioxide. Based on a recent study by Lawrence Berkeley National Laboratory<sup>1</sup>, Federal energy conservation standards promulgated through 2011 saved consumers an estimated \$42 billion on their utility bills and carbon emissions reductions attributed to the standards were realized at 176 million metric tons in 2011.

Q5. What percentage of total global carbon dioxide emissions do you anticipate DOE's set-top box energy conservation standards will save?

A5. DOE has not proposed an energy conservation standard for set-top boxes. If DOE were to propose an energy conservation standard, the proposed rulemaking would include an estimate of the potential carbon dioxide savings.

Q6. If industry is willing to achieve the same cost and energy savings throughout a voluntary agreement, is it still DOE's intention to proceed with a federal rulemaking process?

A6. DOE strongly encourages and will consider any non-regulatory agreement as an alternative to a regulatory standard. DOE recognizes that voluntary or other non-regulatory efforts by manufacturers, utilities, and other interested parties can result in substantial improvements to energy efficiency or reductions in energy consumption. In fact, as part of its rulemaking activities to consider a regulatory efficiency standard, DOE prepares a regulatory impact analysis. The regulatory impact analysis evaluates non-regulatory alternatives to standards, in terms of their ability to achieve significant energy

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<sup>1</sup> Lawrence Berkeley National Laboratory, Energy and Economic Impacts of U.S. Federal Energy and Water Conservation Standards Adopted From 1987 Through 2011, <http://ees.lbl.gov/pub/energy-and-economic-impacts-us-federal-energy-and-water-conservation-standards-adopted-1987-0>

savings at a reasonable cost, and compares the effectiveness of each one to the effectiveness of the proposed standards.

Q7. Considering the American taxpayers are funding this federal rule making process, how do additional layers of government red-tape ultimately benefit the taxpayers considering the industry has agreed to set-top box energy efficiency standards at no cost to the taxpayer?

A7. DOE's statutory requirement is to maximize energy efficiency that is technologically feasible and economically justified (42 USC 6295 (o) (2)). DOE's appliance standards program ensures that taxpayers are receiving cost-effective energy savings as justified by a thorough analysis of alternatives to determine which option conforms to this statutory requirement.

DOE's appliance and equipment standards program seeks to deliver significant benefits to consumers across the country across a wide variety of products. Overall appliance and equipment standards are saving consumers significant amounts on their energy bills and helping avoid significant emissions of carbon dioxide. Based on a recent study by Lawrence Berkeley National Laboratory<sup>2</sup>, Federal energy conservation standards promulgated through 2011 saved consumers an estimated \$42 billion on their utility bills and carbon emissions reductions attributed to the standards were realized at 176 million metric tons in 2011.

#### **QUESTIONS FROM SENATOR BALDWIN**

Q1. You mention in your testimony the subject of commingling defense and commercial waste in the same repository as being a matter of policy since 1985. It is my understanding that the repository requirements for defense high-level waste and commercial spent fuel are quite different. In order to avoid further delays in nuclear

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<sup>2</sup> Lawrence Berkeley National Laboratory, Energy and Economic Impacts of U.S. Federal Energy and Water Conservation Standards Adopted From 1987 Through 2011 , <http://ees.lbl.gov/pub/energy-and-economic-impacts-us-federal-energy-and-water-conservation-standards-adopted-1987-0>

waste processing, clarity about regulatory authority for both defense high-level and commercial waste is essential. Given the opportunity, do you think that the US would benefit by re-separating these waste streams? And if so, do you think that the defense waste should remain with the Department of Energy or be transferred to the proposed Nuclear Waste Administration for management?

- A1. The Nuclear Waste Policy Act requires that either a commingled repository or a defense-only repository be regulated by the Nuclear Regulatory Commission (NRC). As I indicated in my appearance before the Committee, the Department has a study underway to reevaluate whether or not the wastes should be commingled, which draws upon previous work done by the Department. Because the reevaluation is not complete, it is not yet clear what the results will be about commingling and what organization should have the responsibility.
- Q2. The NWAA specifically calls for a pilot interim storage facility that accepts 'priority' used fuel. After Kewaunee Power Station closed in May of this year, along with the LaCrosse Boiling Water Reactor, the state of Wisconsin now has two shuttered plants whose fuel in residence would qualify as 'priority'. In the Administration's current Used Fuel Disposition 'Strategy', is there a similar priority placed on fuel residing at shuttered plants? Can you please elaborate on the Administration's position on the storage of 'priority' versus 'nonpriority' used fuel as it differs from the proposed Nuclear Waste Administration Act?
- A2. The Administration is still reviewing the draft legislation, S. 1240. However, the Administration's Strategy specifically supports the development of a pilot interim storage facility with an initial focus on accepting fuel from shut-down reactor sites: "At its core, this Strategy endorses a waste management system containing a pilot interim storage facility; a larger, full-scale interim storage facility; and a geologic repository in a timeframe that demonstrates the federal commitment to addressing the nuclear waste issue, builds capability to implement a program to meet that commitment, and prioritizes

the acceptance of fuel from shut-down reactors...The Administration supports a nuclear waste management system with the following elements:

- A pilot interim storage facility with limited capacity capable of accepting used nuclear fuel and high-level radioactive waste and initially focused on serving shut-down reactor sites;
- A larger, consolidated interim storage facility, potentially co-located with the pilot facility and/or with a geologic repository, that provides the needed flexibility in the waste management system and allows for important near-term progress in implementing the federal commitment; and
- A permanent geologic repository for the disposal of used nuclear fuel and high-level radioactive waste.”



## Department of Energy

Washington, DC 20585

December 18, 2013

The Honorable Ed Whitfield  
Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On September 18, 2013, Secretary Ernest Moniz testified regarding "The Obama Administration's Climate Change Policies and Activities."

Enclosed are the answers to 17 questions that were submitted by Representatives Barton, Gardner, and Dingell to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis", is positioned above the printed name.

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Bobby L. Rush, Ranking Member



## **QUESTIONS FROM REPRESENTATIVE BARTON**

**Q1. According to an Aug. 29 Bloomberg press report, certain EU Members sought to exclude from the final summary document for the upcoming IPCC assessment any reference to the global warming “hiatus” or “pause” that has occurred over the last 15 years. According to that article, U.S. regulators are also trying to make certain changes to the summary document.**

**a. What is DOE’s role with regard to the development of the IPCC assessment?**

**A1a. The Department of Energy supports a significant amount of climate research that is pertinent to the IPCC. For the IPCC Fifth Assessment Report (AR5), Working Group 1 (WG1), DOE staff, DOE Laboratory staff and academic researchers funded by DOE served in roles of Lead Authors, Contributing Authors, and Reviewer Editors. In addition, experts from DOE contributed to the U.S. Government review of the report in its draft form.**

**b. Did DOE participate with other U.S. regulators in developing comments on the summary document?**

**A1b. The Department of Energy participated in the interagency effort that developed the U.S. Government response to the AR5 WG1 report . DOE employees and DOE national laboratory scientists reviewed both the Second Order Draft and Final Government Distribution of the WG1 report that included the Summary for Policy Makers.**

**c. What changes to the summary document did DOE and U.S. regulators propose?**

**A1c. The U.S. Government provided numerous comments and suggestions to the IPCC . These comments sought to clarify and improve the accuracy of the document. All U.S. agency comments to the IPCC were coordinated and submitted by the Department of State**



**Q2. For the President's Climate Action Plan, has there been an assessment done of the costs to the government to fully implement the plan? If yes, what is the estimated cost?**

**A2. The President's Climate Action plan consists of actions implemented by multiple departments and agencies under existing executive authorities. Many activities will be undertaken within existing budgetary levels, including by reprioritizing current spending. DOE has not conducted a comprehensive assessment of the costs to the government to fully implement the plan.**

**Q3. For the President's Climate Action Plan, has there been an assessment done of the costs to consumers to fully implement the plan? If yes, what is the estimated cost?**

**A3. The President's Climate Action plan consists of actions implemented by multiple departments and agencies under existing executive authorities. Many of the elements of the Plan are explicitly designed to save consumers money (see, for example, the section entitled "Cutting Energy Waste in Homes, Businesses, and Factories") or to reduce costs to consumers through better preparation for the inevitable impacts of climate change (see, for example, the section on "Building Stronger and Safer Communities and Infrastructure"). Where specific elements of the plan call for new standards, the costs and benefits of those standards will be analyzed and balanced through existing provisions of law requiring regulatory analysis and reasoned decision making that takes that cost-benefit analysis into account. Because the implementation of the plan involves decisions that will be taken only after notice and public comment, as well as savings and avoided costs through adaptation, it is not possible to determine a precise cost to consumers, which might well be negative.**

**Q4. Describe the climate change related research and technology programs or activities engaged in by your agency, including programs or activities undertaken with other Federal agencies?**

**A4. Many DOE science and technology programs are related to climate change, even if climate change is not the primary focus. For example, increasing the energy efficiency of appliances both saves consumers money and reduces carbon pollution. Work in support of natural gas development can promote national energy security as well as lead to reduced emissions. Support for nuclear power – both full scale reactor work and new work on small modular reactors – can lead to energy diversification and job opportunities and also benefit the climate. Similarly, basic scientific research can grow US competitiveness, have benefits for clean energy development, and also provide other societal benefits. It is therefore not possible to determine which share of a given program is climate change related and which is not.**

**Q5. Describe the climate change adaptation, mitigation or sustainability related activities engaged in by your agency, including activities undertaken with other Federal agencies.**

**A5. Many DOE science and technology programs are related to climate change mitigation, even if climate change is not the primary focus. In addition, DOE has been engaged in a number of climate change adaptation related activities, including: conducting an assessment of climate change impacts on the energy sector; conducting an assessment of climate-change impacts on DOE's operations and identifying actions to enhance operational sustainability; supporting the development of the third U.S. National Climate Assessment; and developing actionable climate science information for projecting the impacts of climate change.**

**Q6. Identify all climate change related interagency task forces, advisory committees, working groups, and initiatives in which you agency currently participates or has participated since January 2005.**

A6. Since 2005, the Department of Energy has participated in several climate change interagency activities, including the Committee on Climate Change Science and Technology Integration (CCCSTI) and its subsidiary bodies; the Interagency Climate Change Adaptation Task Force; the Department of State-led delegations to the United Nations Framework Convention on Climate Change (UNFCCC) and preparatory meetings of the delegation; the State Department's Interagency Adaptation Committee; the United States Global Change Research Program (USGCRP) Working Group; the Department of Interior Climate Change Adaptation Working Group – Advisory Committee on Water Information; the Interagency Working Group on the Social Cost of Carbon; Review Committees for the IPCC 4th and 5th assessment reports; and interagency led meetings related to the development of the President's Climate Action Plan.

**Q7. Identify all climate change or clean energy related funding, grants or financial assistance programs in which your agency currently participates or has participated, and the amounts of climate change or clean energy related funding, grants, or financial assistance distributed agency, if any, since January 2005.**

A7. Many DOE programs are related to climate change, even if climate change is not the primary focus. For example, increasing the energy efficiency of appliances both saves consumers money and reduces carbon pollution. Similarly, basic scientific research can have benefits for clean energy development, along with other societal benefits. As such, it is not possible to determine which share of a given program is climate change related and which is not.

**Q8. Identify all climate change related regulations or guidance documents, including regulations or standards to reduce greenhouse gas emissions, issued, or proposed by your agency since January 2005, and/or under development by your agency.**

**A8.** Detailed regulatory notices and impact assessments are provided on the relevant DOE program webpage. However, it is impossible to separate DOE's regulatory actions into those that are related to climate change and those that are not.

**Q9. Identify all climate change related international negotiations, agreements, partnerships, working groups, or initiatives in which your agency currently or has previously participated, and the role of your agency in those activities, since January 2005.**

**A9.** The Department of Energy coordinates a number of energy initiatives through bilateral and multilateral forums; a number of these also include climate change related work.

The Department's bilateral relationships and agreements involve a range of countries including: Argentina, Australia, Brazil, Canada, Chile, China, France, India, Indonesia, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, and the United Kingdom. Specific bilateral initiatives include the U.S.-Brazil Strategic Energy Dialogue (SED), the U.S.-China Clean Energy Research Center, the U.S.-India Partnership to Advance Clean Energy – Deployment (PACE-D), and the Turkey Near Zero Zone and Industrial Energy Efficiency Training.

The Department works on a number of longstanding multilateral processes, including:

- The Asia-Pacific Economic Cooperation (APEC), which DOE uses to coordinate on energy efficiency, renewable energy, clean fossil energy, and energy data and analysis issues for the region.

- The Clean Energy Ministerial, for which DOE serves as the Secretariat, has current initiatives that focus on transforming the global power sector, driving equipment and appliance efficiency, and transferring best practice policy solutions for clean energy.
- The Energy and Climate Partnership of the Americas (ECPA) which is working on energy efficiency, renewable energy, a more resilient and modern energy infrastructure, and energy poverty.
- G20 initiative on Fossil Fuel Subsidy Reform, which DOE, in coordination with the Department of Treasury, spearheads the initiative for G20 countries to phase out inefficient fossil fuel subsidies over the medium term.
- International Energy Agency, where DOE leads interactions on oil markets, and also participates in discussions on global energy supply and demand and technology.
- Major Economies Forum on Clean Energy and Climate, a group led by the State Department, but where DOE provides technical inputs on issues such as energy efficient buildings, renewable energy technology, carbon capture and storage.
- Carbon Sequestration Leadership Forum, an international group of large fossil fuel users working together to promote carbon capture and storage technologies.
- United Nations Framework Convention on Climate Change, where DOE participates as a member of the State Department-led delegation to negotiations.

**Q10. Provide the approximate amount of annual agency funds attributed to climate change activities for each of the years 2005 through 2012.**

**A10.** Many DOE science and technology programs are related to climate change, even if climate change is not the primary focus. For example, increasing the energy efficiency of appliances both saves consumers money and reduces carbon pollution. Similarly, basic

scientific research can have benefits for clean energy development, along with other societal benefits. As such, it is not possible to determine which share of a given program is climate change related and which is not.

**Q11. Describe the actions your agency has undertaken to respond to the Executive Order 13514 including the approximate costs, personnel, and other resources dedicated by your agency to implementing this executive order.**

**A11. The DOE Sustainability Performance Office (SPO) ensures Departmental compliance with Federal and Departmental sustainability requirements, including mandates from the Energy Policy Act of 2005, the Energy Independence and Security Act of 2007 and Executive Orders 13514 and 13423. These activities further the Department's strategic goal of advancing the Nation's energy and economic security by ensuring that DOE increases its energy productivity and energy diversity, while reducing GHG emissions and energy use.**

The SPO coordinates data collection, reporting, and analysis of departmental energy, water, and resource data and manages and implements the Department's annual Strategic Sustainability Performance Plan. Technical assistance is provided to DOE's 47 major sites throughout the U.S. in support of sustainability goal progress and achievement.

SPO also supports the Department's effort to increase the use of alternative financing and performance contracting to fund many of the improvements associated with meeting the statutory efficiency goals. To date, the Department has utilized performance contracts for approximately \$512.6 million in project investment, including the largest wind farm on Federal land at the Pantex Plant in Amarillo, Texas, saving taxpayer dollars while improving the environment. Additionally, SPO provides oversight and execution of energy, water, and resource assessments. These assessments, coupled with the

implementation of cost-effective energy conservation measures and efficiency improvements, reduce the Department's operating expenses, overall energy use, and GHG emissions.

The SPO is funded from the DOE Specific Investments line item in the Federal Energy Management Program (FEMP) budget. The FY 2013 appropriations level was \$3.774M.

The Federal Energy Management Program provides access to public data illustrating the progress made by Federal agencies toward meeting greenhouse gas reduction targets required under E.O. 13514. It also collects and reports to Congress annually on the activities of Federal agencies to improve water efficiency and management.

**Q12. Provide a list of each sub-agency, division and/or program office within your agency that is currently engaged in climate change related activities, and provide an estimate of the approximate number of your agency employees and/or contractors currently engaged part-time or full-time in climate change related activities.**

A12. Many DOE science and technology programs are related to climate change, even if climate change is not the primary focus. For example, the nuclear energy program is working to make nuclear energy safer and more affordable, which will also have climate change mitigation benefits. Similarly, scientific research provides a foundation for future economic growth and may also lead to breakthroughs in clean energy. As such, it is not possible to determine which program offices and employees are working on climate change related activities.

## **QUESTION FROM REPRESENTATIVE GARDNER**

**1. The Energy Star program has been used by consumers for many years as a guide to purchase sensible, energy efficient products. In Administrator McCarthy's previous role as Assistant Administrator for Air, she oversaw the entire Energy Star program. Historically, industry and retailers in the Windows, Doors and Skylights sector have strongly supported the program. However, today virtually all are questioning both the process for revising product standards and, as a result, the standards themselves.**

**Manufacturers and retailers believe that, in the name of saving the most energy possible, the EPA proposed Energy Star standards can only be met by products too expensive for consumers to justify the added expense. This is especially true when the payback period is significantly longer than the average length of time a homeowner stays in their house.**

**Q1. If Manufacturers and retailers, who are closer to the consumer than energy star technicians, believe there is a problem, how can the program be successful?**

**A1. ENERGY STAR is a voluntary partnership among consumers, manufacturers, and government, united in the pursuit of a common goal: to protect our environment for future generations by changing energy efficient practices today. ENERGY STAR's use of two core principles – transparency and maintaining a collaborative relationship with both industry and other stakeholders – has led to the program's success.**

**Consistent with these principles, when establishing new criteria, or revising existing criteria, ENERGY STAR works in close collaboration with stakeholder groups, including manufacturers, retailers, energy efficiency program sponsors and interested non-governmental organizations.**

**Technical and economic analysis is performed and shared to ensure that the criteria are established in a manner that highlights cost-effective products available to consumers.**

**Q2. Isn't it in the interest of the retailers and manufacturers to promote the most energy efficient AND economically efficient product possible?**



A2. ENERGY STAR is a voluntary partnership that includes retailers, manufacturers and government, among others. In addition to its primary energy-savings goal, the partnership also seeks to reduce greenhouse gas emissions and other pollutants caused by the inefficient use of energy, and it aims to make it easy for consumers to identify and purchase energy-efficient products. Products that have earned the ENERGY STAR designation meet strict criteria for energy efficiency set by EPA according to the test methods developed by DOE in support of the ENERGY STAR product designations (the Energy Star program for windows, skylights, and doors was previously managed by the Department of Energy, but is now managed by EPA). Participation in the ENERGY STAR program is in the interest of retailers and manufacturers, as it enables them to differentiate their products in the marketplace and benefit from an increasingly recognized and sought-after symbol. ENERGY STAR partners can join national campaigns supporting key product areas and add their products to a Qualified Products listing for consumers to consult when shopping for energy efficient products.

A guiding principle of the Energy Star program consists in establishing criteria such that consumers will recover their investment in increased energy efficiency through utility bill savings, within a reasonable period of time. Specifically, ENERGY STAR specifications are set so that if there is a cost differential at the time of purchase, that cost is recovered through utility bill savings within the life of the product.

Like the Department of Energy's mandatory federal Appliance and Equipment Efficiency Standards Program, the voluntary ENERGY STAR program seeks to increase the average efficiency of new purchased products. However, instead of prohibiting the manufacture and sale of products that do not meet a certain efficiency threshold, the ENERGY STAR program encourages the voluntary adoption of highly efficient products. Products that meet the ENERGY

STAR efficiency level can be labeled as ENERGY STAR qualified. This process ensures economic efficiency by providing consumers with sufficient information to consider a given product's efficiency (and the resulting operating cost savings) in their voluntary purchasing decision. These two programs are complementary in that they promote energy-efficiency improvements in appliance products over a broad range of price points.

**Q3. Energy Star products cost more than other products. So, if the President believes that everyone has a role in reducing greenhouse gases emissions, then how does it make sense to discourage consumers from purchasing Energy Star products, since they won't see that added investment paid back for a decade or more.**

**A3. A guiding principle of the Energy Star program consists in establishing criteria such that consumers will recover their investment in increased energy efficiency through utility bill savings, within a reasonable period of time. Specifically, ENERGY STAR specifications are set so that if there is a cost differential at the time of purchase, that cost is recovered through utility bill savings within the life of the product.**

## **QUESTIONS FROM REPRESENTATIVE DINGELL**

**Q1. Does DOE see a future for coal as a viable energy source in light of the impending greenhouse gas regulations?**

**A1.** Today, coal accounts for about 20% of the total energy consumption in the United States, and fuels about 40% of our electricity generation. Coal will continue to be an important part of the Administration's all-of-the-above energy strategy. The current challenge of addressing climate concerns is not a new development for the coal industry insofar as environmental regulations have historically driven the development of new technologies to one degree or another, depending on the requirements of the particular statutory standard at issue.

DOE's research, development, and demonstration of advanced carbon capture and storage (CCS) technologies will enable CCS deployment as rapidly as possible, and allow coal to maintain its role in producing baseload electricity for America while providing the technology development push which will be essential to meeting the President's broad national energy goals. DOE will continue to tackle the technical challenges and reduce costs for advanced clean coal technologies, and to provide key information to decision makers inside and outside government about the current and future opportunities for coal as a competitive clean-energy fuel.

**Q2. What is DOE doing on potential shortages of electric power because of the actions being taken on global warming and how that will affect our future regarding the availability and reliability of electric power?**

**A2.** The President's Climate Action Plan, announced in June, calls for upgrading the country's electric grid because it is critical to our efforts to make electricity more reliable, save consumers money on their energy bills, and promote clean energy sources. A nine

member interagency team, known as the Rapid Response Team for Transmission (RRTT), created in 2011, aims to identify ways to improve the overall quality and timeliness of electric transmission infrastructure permitting, review, and consultation by the federal government on both federal and non-federal lands to help ensure transmission projects are not unnecessarily delayed. Under a June 7, 2013 Presidential Memorandum entitled “Transforming our Nation’s Electric Grid through Improved Siting, Permitting, and Review,” the RRTT members were charged with the development of an integrated, interagency pre-application (IIP) process for significant onshore electric transmission projects requiring Federal approval(s).

A formalized pre-application process, with DOE acting as lead coordinating agency (as authorized by Congress in 2005 through Section 216(h) of the Federal Power Act), is expected to result in improvements to efficiency and timing of Federal agency authorization(s). These improvements will, in turn, expedite the construction and provision of transmission capacity necessary to bring electricity generated through renewable and other low-carbon generation sources online as demand is expected to increase. In addition to providing new pathways to bring low-carbon energy to market in the near future, these improvements in siting transmission infrastructure will allow for improvements in grid reliability. Additionally, these improvements will support sustained flexibility in electric markets gained through longer term investments in energy efficiency and conservation efforts, demand-response and micro-grid technologies.



**Department of Energy**  
Washington, DC 20585

January 30, 2014

The Honorable Ron Wyden  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On November 7, 2013, Brigadier General John Kem, Commander, U. S. Army Corps of Engineers, Northwestern Division, Member, U. S. Entity for the Columbia River Treaty, and Stephen Oliver, Vice President Generation Asset Management, Bonneville Power Administration, Coordinator, U. S. Entity for the Columbia River Treaty, testified regarding the consideration of the Columbia River Treaty.

Enclosed are the answers to eight questions addressed to Stephen Oliver that were submitted by Ranking Member Murkowski and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in cursive script, reading "Christopher E. Davis".

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Lisa Murkowski, Ranking Member



## **QUESTION FROM CHAIRMAN WYDEN**

### **RECENT RECOMMENDATIONS FOR THE COLUMBIA TREATY**

- Q1.** The United States is obligated to return to Canada one-half of the downstream power benefits gained as a result of operation of the three Columbia River Treaty dams in Canada. My understanding is that the half of the downstream power benefits owed to Canada is called the “Canadian Entitlement.” What is the current Canadian Entitlement calculated using the current assumptions built into the Columbia River Treaty? What now does BPA estimate is the actual value of the Canadian Entitlement?
- A1.** Currently, Canada’s portion of the downstream power benefit, the “Canadian Entitlement,” is based on the additional hydrogeneration produced by Canadian Treaty dams – essentially, the difference between the power generated by the U.S. 1961 power system with and without the dams. The Canadian Entitlement is power returned to Canada, not a monetary payment. The current value of the power returned to Canada is estimated to be between \$220 million and \$360 million annually. It is the opinion of the U.S. Entity – and Bonneville Power Administration (BPA) – that the power benefits between the two countries should be rebalanced to instead be based on the more realistic measure of the power value of coordinated operations as compared to non-coordinated operations. BPA estimates that the resulting value of the Canadian Entitlement would be between \$44 million and \$110 million annually. A document describing in more detail how we continue to analyze this estimate is attached to this response.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

- Q1. In your view, what have been the greatest strengths of the Columbia River Treaty over the last 50 years? What are its greatest shortcomings?**
- A1. What have been the greatest strengths of the Columbia River Treaty over the last 50 years?**

The view of the U.S. Entity is that the Columbia River Treaty (CRT) between the United States and Canada has been an important economic driver for the region on both sides of the border since it was executed in 1964. The Treaty required the construction of three large dams in British Columbia, Canada, and gave the United States the right to build Libby Dam in Montana with a reservoir that extends into Canada. This more than doubled the amount of Columbia River basin reservoir storage, which eliminated major flood damages for all but extreme events and increased downstream hydropower generation. The smoothing of annual stream flows has also provided billions of dollars of power benefits in both countries.

The U.S. Entity also believes that one of the strengths of the Treaty is that it also provides for the certainty of coordination of flows across the border and benefits a number of other uses of the Columbia River, including navigation, irrigation and municipal and industrial water supply. In addition, the two nations have been able to negotiate supplemental agreements for other ecosystem benefits, including an annual agreement that provides up to 1 million acre-feet to augment flows for fish in both the U.S. and Canada.

**What are its greatest shortcomings?**

While the CTR has provided many critically important benefits to the Region particularly in energy production and flood risk management, the Treaty does not identify ecosystem considerations. While it is recognized that significant ecological improvements are being implemented and realized in a number of critical areas and are anticipated to continue over time, there is an opportunity for inclusion of certain additional ecosystem operations to expand, enhance, and complement these existing ecosystem investments as part of the post-2024 Treaty. Accordingly, the U.S. Entity sees opportunities to better meet future needs and changing values through “modernizing” the Treaty in several important areas including: designing a mutually-workable “called-upon” flood risk management operation; rebalancing the Canadian Entitlement; incorporation of ecosystem operations; providing for future water supply needs; and the ability to address climate change.



## **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q2. What are the Administration's expectations for the advice and consent of the Senate? Are there any potential Treaty modifications under consideration that the Administration does not believe would require consideration by the Senate? If so, please explain.**

**A2: The U.S. Entity cannot speak to the Administration's expectations for the advice and consent of the Senate. However, the entities (U.S. Entity and Canadian Entity) are empowered and charged with the duty to formulate and carry out the operating arrangements necessary to implement the Columbia River Treaty, in the form the two countries have entered into it. Through the Columbia River Treaty Review, the U.S. Entity conducted a preliminary evaluation of implementation of the current Treaty post 2024 and looked at possible alternative scenarios to assist us in the development of a regional recommendation for consideration by the Administration through the National Policy Interest Review. The region's goal is for the United States and Canada to develop a modernized framework for the Treaty that ensures a more resilient and healthy ecosystem-based function throughout the Columbia River Basin while maintaining an acceptable level of flood risk and assuring reliable and economic hydropower benefits. Therefore, the U.S. Entity believes it is important to achieve a modernized framework for the Treaty that balances power production, flood risk management, and ecosystem-based function as the primary purposes, while also recognizing and implementing all authorized purposes.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q3. The Draft Recommendation calls for adding a comprehensive Ecosystem Function as the third primary purpose (in addition to power production and flood control) of the Columbia River Treaty. How do you define Ecosystem Function? Would it include credit for actions already being done, such as compliance with the Endangered Species Act? Who will bear the costs of this new Ecosystem Function?**

**A3. How do you define Ecosystem Function?**

The U.S. Entity's perspective is that although the definition of ecosystem in general is very broad, the definition of Ecosystem-based Function in the context of the Columbia River Treaty Regional Recommendation is specifically defined by the content of the recommendation. The Ecosystem-based Function section states that providing streamflows from Canada with appropriate timing, quantity and water quality to promote productive populations of anadromous and resident fish, and provide reservoir conditions to promote productive populations of native fish and wildlife is the general objective. Then the specific recommendations are to: incorporate current flow augmentation and dry year flow strategies; accommodate flow augmentation modifications post-2024; recognize and minimize adverse effects to tribal, First Nations and other cultural resources in Canada and the United States; adapt to meeting ecosystem-based function requirements as new information becomes available or conditions change; jointly explore fish passage on the main stem Columbia with Canada; and, continue to coordinate the variable quantity flows from Libby in support of specific listed fisheries.

**Would it include credit for actions already being done, such as compliance with the Endangered Species Act?**

**This is a question that would have to be negotiated between Canada and the U.S., however, in the Recommendation, it is expected that any storage and release actions**

performed under the Treaty would be coordinated and complement U.S. domestic fishery mitigation actions. The recommendation states this as follows: “it is recognized that significant ecological improvements are being implemented and realized in a number of critical areas and are anticipated to continue over time, there is an opportunity for inclusion of certain additional ecosystem operations to expand, enhance, and complement these existing ecosystem investments as part of the post-2024 Treaty”.

**Who will bear the costs of this new Ecosystem Function?**

While the exact allocation of costs would be a subject of a negotiation between the parties, one of the central principles of our recommendation is that we are advocating a balanced approach to any Treaty modernization that respects the current balance of water uses in the Pacific Northwest, “with the intent that all of the interests addressed herein be improved”. The recommendation states that, “U.S. interests should ensure that costs associated with any Treaty operation are aligned with the appropriate party.” We also make it clear that, “implementation of ecosystem-based functions in the Treaty should be compatible with rebalancing the entitlement and reducing U.S. power costs” as well as “preserving an acceptable level of flood risk to the people of the Basin, and continuing to recognize and implement the other authorized purposes in the Basin”.

Analyses performed as part of the Sovereign Review Team process showed that some Ecosystem-based Function actions could potentially involve significant tradeoffs from a power operations perspective and flood risk perspective for both the U.S. and Canada.

**We also identified some lesser magnitude actions potentially beneficial to ecosystems that would not entail significant costs or risks that might be explored.**

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q4.** You've testified that the U.S. Entity would also like to "pursue operational flexibility necessary to respond to climate change" in an updated Treaty. Indeed, the Draft Recommendation states that there should be "new terms in the post-2024 Treaty to allow the adaptive management of coordinated Treaty operations to better mitigate any impacts associated with climate change." What exactly does that mean? How will "associated impacts" of climate change be measured? Is this concentration on climate change in addition to a new Ecosystem Function as an authorized purpose of the Treaty?

**A4:** While the U.S. Entity is not a principal element of the U.S. Government engaged in climate studies or analysis of impacts, climate change studies conducted by the Army Corps of Engineers (Corps) and BPA for the Columbia River basin have indicated the potential for increased runoff in the winter, earlier timing of the peak spring snowmelt, and the subsequent risk of lower summer flows. It is the conclusion of the U.S. Entity that greater operational flexibility would give both the U.S. and Canada the ability to address these risks as they may appear in the future.

With respect to measuring the "associated impacts" of climate change, the U.S. and Canadian Entities have a joint Hydro-Meteorological team that continuously studies precipitation and streamflows in the basin. In addition, the U.S. Entity continues to work with the research community to intensify regional monitoring, particularly temperatures and streamflow timing, using existing meteorological and streamflow data networks. This allows us to monitor whether the warming we are already observing in the region is beginning to impact our ability to manage floods, to meet electricity demands, and sustain ecosystems. Using this regional monitoring data and the best available science, operating criteria can be adapted in response to a changed climate.

With respect to the relation of climate change to purposes of the Treaty, the latest climate change modeling by the Corps, BPA, University of Washington, USGS and others suggests that flood control, power production, and ecosystems could all be impacted by climate change. Thus, the U.S. Entity sees climate change, not as a proposed new primary purpose, but as an overarching issue which could impact all Treaty operations if the Treaty were to continue over the long term.

## **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q5. The “Canadian Entitlement” as it has become known, is the amount of electric power the U.S. is obligated to deliver to Canada – equal to one-half the estimated downstream power benefits from the operation of Canadian Treaty storage. Currently, the entitlement requires the U.S. to deliver power to Canada worth approximately \$250-\$350 million annually. However, the Treaty assumes that the power generation in the U.S is optimized for power generation even though our system operations have a number of competing demands, such as environmental requirements. How does Canada perceive the “Canadian Entitlement”? How does the U.S. position differ? Do you agree with Dr. Karier’s assessment that the U.S. is receiving only about one-tenth of the actual power benefits? Should the U.S. obligation to return power to Canada be reduced?**

**A5. How does Canada perceive the “Canadian Entitlement”?**

The Government of Canada, to our knowledge, has not asserted a formal perspective on the Canadian Entitlement.

The Province of British Columbia, through the BC Ministry of Energy and Mines, released a paper on June 25, 2013 on, “U.S. benefits from the Columbia River Treaty – Past, Present, and Future: A Province of British Columbia Perspective”.

<http://blog.gov.bc.ca/columbiarivertreaty/files/2012/07/US-Benefits-from-CRT-June-25-132.pdf> . Further, the Province of British Columbia released its draft recommendation on the Treaty earlier this fall that included a statement about its view of the Canadian Entitlement in its second of 14 principles. It reads, “2. The ongoing impacts to the Canadian Columbia Basin to meet Treaty requirements should be acknowledged and compensated for. The level of benefits to the Province, which is currently primarily in the form of the Canadian Entitlement, does not account for the full range of benefits in the United States (U.S.) or the impacts in British Columbia.”

**How does the U.S. position differ?**

**While the U.S. Entity cannot speak for the U.S. government on this point, the U.S. Entity perspective is that the Treaty should be modernized so that the payments to Canada post 2024 should be based on an equitable sharing of the power benefits of a coordinated Canadian operation as compared to a non-coordinated operation. Based on the present formula developed in the 1960s, BPA estimates the Canadian share of the downstream benefits in 2024 is significantly greater than anticipated, and far exceeds the value of coordinated power operations under the Treaty.**

**Do you agree with Dr. Karier's assessment that the U.S. is receiving only about one-tenth of the actual power benefits?**

**Dr. Karier's assessment is based on only one specific predominant aspect of the Entitlement relative to its energy value. If we consider a more complete array of factors, however, preliminary estimates by BPA of one-half of the estimated actual value of Canadian coordination post 2024 range from 10 percent to 30 percent. This range considers other factors such as 1) certainty of operations, 2) firm energy value, and 3) seasonal shape and value of energy and capacity.**

**The U.S. obligation to return power to Canada be reduced?**

**In the opinion of the U.S. Entity, yes, although this is a matter for the U.S. Government to decide. In our opinion, based on the present formula developed in the 1960s, the estimated value of the Canadian share of the downstream benefits in 2024 is significantly greater than anticipated, and far exceeds the value of coordinated power operations under the Treaty.**



## **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q6. What is the Executive Branch doing to integrate the concerns raised by various groups in their public comments on the draft recommendations? Should Congress expect major changes to the draft recommendations?**

**A6. The U.S. Entity was tasked by the Department of State and the Interagency Policy Committee to produce a regional recommendation that reflects the broadest possible consensus. The regional recommendation was developed by the U.S. Entity in collaboration and consultation with the Pacific Northwest states and federally recognized Columbia Basin Tribes, a variety of stakeholders, and the public through the multi-year Columbia River Treaty Review process. As such, it is a regional recommendation only, not an Executive Branch Statement of Administration Policy. We have conducted extensive stakeholder and public outreach through workshops, panel discussions, and individual meetings, and amassed valuable perspectives, comments, and technical analyses.**

**We have collated all the comments received on the June 27, 2013, working draft regional recommendation and the September 20, 2013, draft regional recommendation, and have continued to coordinate and seek input from sovereigns and interested stakeholders as we complete the recommendation.**

**Changes to the recommendation have been made in an attempt to accommodate various perspectives, achieve as much regional consensus as possible, and ultimately to develop a modernized framework.**

### **QUESTION FROM RANKING MEMBER MURKOWSKI**

**Q7. Do you support the continuation of this treaty with Canada?**

**A7. The determination on the future of the Treaty is within the purview of the U.S.**

**Government. The U.S. Entity supports improving the Treaty for the benefit of all interests in the Pacific Northwest region and ensuring that the Treaty is sustainable for the long term.**

## QUESTIONS FROM CHAIR LANDRIEU

Length of Reauthorization: The most important change of the Reauthorization Act was reauthorizing the program. The Senate wanted permanency originally, and its final version passed with 8 years. The House wanted 2 years. The compromise was 6 years. If the House version had been enacted, the programs would be expiring on Sept. 30, 2014.

- Q1. Question for All participants—As a business owner, SBIR expert or advocate, or SBIR program manager, would a two-year reauthorization period, with an expiration approaching in September, be good or bad? Please explain why. This is important for informing the next reauthorization.
- A1. From the perspective of an SBIR program manager, longer reauthorizations are important for implementing new initiatives to improve these programs. Under a two-year reauthorization, an administrative funding pilot would be impractical, since only one year of administrative funds could be authorized and there would still be insufficient time to report on the pilot prior to the next reauthorization. Engaging with external organizations on new initiatives would also be more challenging if these organizations perceive the initiatives may only exist for two years. For example, DOE recently engaged with technology transfer offices at universities to facilitate the use of the SBIR/STTR funding to commercialize DOE-funded research at these universities. This initiative required the university and DOE to first reach agreement on a memorandum of understanding. Universities are less likely to make this investment in time if the initiative would have been in place for FY 2014 only.

Longer reauthorizations are also important to agency efforts to expand the applicant pool to include new small businesses so that we can obtain the highest quality applications. If these businesses perceive the programs to be of only short duration, they may not invest the effort to learn about these programs and submit applications.

VC Majority-Owned Small Businesses: The law changed the eligibility of these small business programs to allow, for the first time, firms majority owned by entities—venture capital firms, private equity firms and hedge funds—instead of individuals, to compete for a portion of SBIR funds. It was not a mandate on each agency; it gave flexibility to agencies to determine if it was needed for their technology problems and then opt in. This was very controversial, and we need to make sure it is working and controls are in place to make sure the firms are American-owned and are small businesses, not puppets of corporations and foreign firms.

Q2. Question for NIH/Dr. Portnoy and Department of Energy/Dr. Oliver—When did or when will your agency start making VC SBIR awards? And how much and what percent of the VC portion has been used so far?

A2. Within the Department of Energy, the Advanced Research Projects Agency - Energy (ARPA-E) has exercised the authority to make awards to small businesses that are majority-owned by multiple venture capital operating companies, hedge funds, or private equity firms (section 5107 authority). ARPA-E provided notice to the Small Business Administration and Congress in August 2013 of its intent to utilize section 5107 authority and started utilizing the authority for its FY 2013 SBIR awards. While award negotiations for the FY 2013 SBIR awards remain ongoing, approximately \$1.7 million—and no more than 25%—of ARPA-E's FY 2013 SBIR set aside is expected to be awarded to small businesses that are majority-owned by multiple venture capital operating companies, hedge funds, or private equity firms. For the remainder of the Department's SBIR/STTR programs, administered within the Office of Science (which handled approximately 96% of the Department's FY 2013 SBIR funding), there was no use of section 5107 authority.

Diversity and Geographic Distribution of Awards: Most of the awards are won by firms competing on the west coasts, but we know we have good science and innovation in all our states. Also, we know the programs aren't meeting the Congressional objectives of participation of women and minorities, as demonstrated by the map I presented at the roundtable.

- Q3. Question for SBA, SBIR Agencies and Dr. Jain—We need a coordinated, targeted and sustained plan with benchmarks to improve geographic distribution of awards. What coordinated plans does the Administration have in the works or in place to improve geographic distribution of awards?
- A3. An Outreach & Communications working group, chaired by John Williams (Navy SBIR/STTR program manager) and Ed Metz (Department of Education SBIR program manager), will address opportunities to improve outreach, particularly to under-represented groups, starting in January, 2014. This working group includes a representative from SBA and SBIR/STTR program staff from DHS, DOD, DOE, NIH, and NSF. This group plans to collect information on outreach efforts at the agencies, including existing and planned outreach targeted at improving geographic distribution. The goals for the working group have not been established but it is anticipated that one of those goals will be the implementation of a coordinated outreach strategy that will include improving geographic distribution of awards.

The Department of Energy has implemented two practices that have improved outreach to under-represented states: webinars and state outreach meetings. These are examples of individual agency efforts that the Outreach and Communications working group will evaluate as part of a coordinate federal outreach strategy. Our webinars, which discuss both our technical topics and the application and award process, have reached 3,000 potential applicants over the past two years, a number far higher than we can reach through in-person meetings. Attendees from all 50 states, the District of Columbia, and Puerto Rico have attended our webinars.

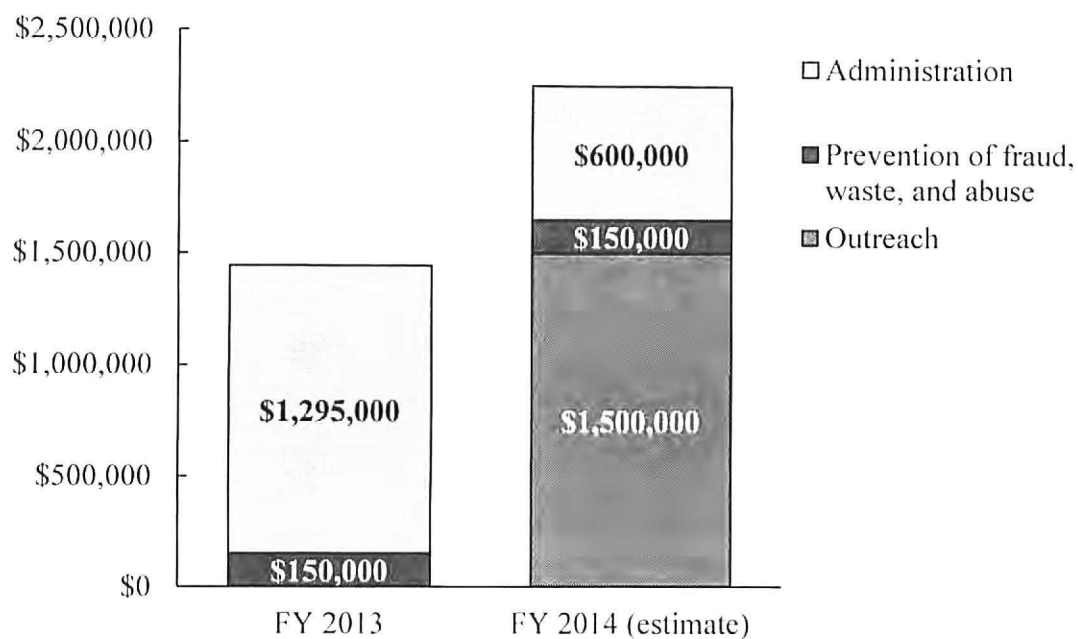
We have also contacted Small Business Development Centers from under-represented states to identify opportunities to do conduct outreach meetings with small businesses. One example was a February 2013 meeting, hosted by the South Carolina Clean Energy Business Alliance. I

provided an introduction to the DOE SBIR and STTR programs, while Earl Wagener, CEO, Tetramer Technologies and Michael Lake, Co-founder, Liquid Lignin, two South Carolina small businesses that have received DOE SBIR Phase I and Phase II awards, discussed their experiences with these programs and how they were able to leverage these programs to bring new innovations to market.

3% Funding for Administrative, Outreach & Oversight Purposes: For the first time in the history of the SBIR and STTR programs, Congress allowed the agencies to use a portion (up to 3%) of their SBIR funds (not STTR funds) for new initiatives to help the program managers do their jobs and make the programs better and more diverse. On a three-year pilot basis, agencies are allowed the money, and a big emphasis for the Senate is outreach. P.L. 112-81 named a national conference as an allowable expense, and the Senate would like to see the Administration build on the work that John Williams of the Navy SBIR program did last year to restart a national conference. The Senate emphasized that the funds should be used to make conferences affordable for students and start-ups. The law also required agencies to have a plan approved by the SBA before they could use the money. The Congress wanted plans to have metrics to be able to measure and assess in three years, at the end of the pilot, whether the pilot should be continued or return the money to the general SBIR funding for awards to small businesses.

Q4. Question for the SBA and agencies—Provide a chart to the Committee that breaks down the plans for each agency's use for the money.

A4. The chart below provides the FY 2013 (actual) and FY 2014 (estimated) use of administrative funding by DOE. Within DOE, ARPA-E administers an independent SBIR program, and used its SBIR funding for awards only, with no SBIR funding used for administrative, outreach, or oversight purposes; so ARPA-E funding is not included within the chart.



- Q5. Question for the SBA and the SBIR Agencies—Please provide in the chart above the dollar amount of the 3% for each participating agency, and also provide how much of the 3% funding is going to outreach for diversity and geographic distribution (dollars and percent of the 3%)?
- A5. In FY 2013, DOE made \$1,445,000 available for administrative and oversight, and did not have any funding for outreach. The maximum amount DOE could have made available for these purposes was \$4,849,743 (three percent of the SBIR total of \$161,658,110, which includes \$6,121,110 of ARPA-E funding).

For FY 2014, DOE is planning to implement a Phase 0 Assistance program that is targeted at three under-represented groups: small businesses that are majority-owned by socially and economically disadvantaged individuals, small businesses that are majority-owned by women, and small businesses from under-represented states. This assistance program will be executed by a contractor at an initial annual estimated cost of \$1,475,000. Because we don't yet have our FY 2014 SBIR budget, we cannot provide the exact percentage of the maximum allowable administrative funds that this figure represents. We estimate it to be approximately 25–30% of the maximum allowable administrative funds.

Commercialization Provisions: The law included several provisions designed to increase the transition of technologies developed by small business firms in the SBIR and STTR programs. For example, the law created an SBIR/STTR acquisition preference to try and ensure that Federal agencies and prime contractors give Phase III awards to the small firms that developed the technology through the SBIR and STTR programs. And to provide some accountability if they are doing it, and planning to do it, the law required the agencies and departments to establish goals and reporting requirements on Phase III awards.

Question for the SBA and Agencies—I sent a letter to the agencies on March 5, 2013, regarding the commercialization sections of the law to get an update on implementation.

Q6. Have the agencies established Phase III goals? Please be specific of what the goals are.

A6. Phase III goals, as stated in 15 USC § 638 (y)(4)(A), are applicable only to the Department of Defense.

Q7. Are the acquisition agencies complying with the SBIR/STTR preference and sole source?

A7. The Department of Energy is not an acquisition agency.





**Department of Energy**  
Washington, DC 20585

February 24, 2014

The Honorable Claire McCaskill  
Chairman  
Subcommittee on Financial and Contracting Oversight  
Committee on Homeland Security and Governmental Affairs  
United States Senate  
Washington, DC 20510

Dear Madam Chairman:

On June 27, 2013, J. E. "Jack" Surash, Deputy Assistant Secretary for Acquisition and Project Management, Office of Environmental Management, testified regarding the Contract Management by the Department of Energy.

Enclosed are the answers to 17 questions submitted by you and Ranking Member Ron Johnson for the hearing record.

Also enclosed are five Inserts that were requested by Ranking Member Ron Johnson, Senator Mark Begich, and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher E. Davis", is written over a circular stamp that is partially obscured.

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Ron Johnson, Ranking Member



## **QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 1. The Department of Energy is the largest civilian contracting agency, spending nearly 90% of its budget on contracts. Unfortunately, contract management seems to be the Department's biggest weakness. The Department of Energy has been on GAO's high risk list for its contract management for over 20 years.**

**Q1: What are the top three reasons the Department has struggled with contract management for so long?**

**A1: The Department's April 2008 Root Cause Analysis highlighted three reasons for continuing challenges with contract management: inadequate front-end planning; inadequate numbers of federal contracting and project personnel with the appropriate skills (e.g., cost estimating, scheduling, risk management, and technical expertise) to plan, direct, and oversee project execution; and risks associated with projects were not objectively identified, assessed, communicated, and managed through all phases of planning and execution.**

**In January 2009, GAO acknowledged that DOE had met three of the five criteria for removal of high risk designation. In the 2013 biennial update, the GAO narrowed the scope of its high risk designation, to EM contracts and capital asset projects with costs greater than \$750 million. DOE leadership has continued to remain fully engaged and laser focused on our journey to continue contract and project management improvements.**

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 2. The Department of Energy has been without a confirmed assistant secretary since 2011.**

**Q2: How have vacant leadership positions impacted the Department's ability to manage contracts effectively?**

**A2: The Office of Environmental Management (EM) has had an Acting Assistant Secretary since the departure of the previous Assistant Secretary. After the acting appointment expired due to time limitations, the former Acting Assistant Secretary has remained with the program as a Senior Advisor for Environmental Management, and EM's Principal Deputy Assistant Secretary executes the statutory duties that cannot be performed by a Senior Advisor. EM continues to fulfill the mission of the program without impact on contract management activities.**

### **QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 3. One reason appears to be that safety issues are not incorporated in the design and planning phase of these projects.**

**Q3: At what point is the Defense Nuclear Facilities Safety Board (“Safety Board”) consulted in the planning process? Why isn’t the Safety Board brought into the planning process earlier to avoid unnecessary risks and costs?**

**A3: The Defense Nuclear Facilities Safety Board (DNFSB) has the authority to review the Department’s defense nuclear construction projects at their earliest phase. As outlined in the DNFSB’s authorizing legislation, the Board has the ability to review the design of a new DOE defense nuclear facility before construction of such facility begins and can recommend to the Secretary, within a reasonable time, such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety.**

**In practice, DOE and DNFSB leadership and staff have both routine communications and periodic briefings to provide information on nuclear projects and activities. In addition, the DNFSB has access to DOE information, facilities and staff associated with nuclear projects from inception. The DNFSB has asked questions, provided comments, and written formal correspondence in the form of letters and recommendations providing the Board’s perspective throughout the lifecycle of many of DOE’s projects.**

## **QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 4. Most environmental remediation is concentrated among a few large contractors, who frequently form joint ventures with each other. These contractors refer to themselves as “competimates”, meaning that they may be competitors for one project, but joint venture teammates on another. While the Department has stated that it is fortunate to have well-qualified contractors capable of doing the technically complex tasks it demands, contractors outside this circle have complained that the Department is not open to working with new contractors.**

**Q4: Why does the Department rely on such a relatively small number of large contractors for its major projects?**

**A4: Although the industrial base of contractors that are capable of executing nuclear projects at the requisite quality and safety levels is limited, DOE is open to and has made attempts to encourage new entrants to join the pool of qualified contractors. These efforts include industry days and site visits scheduled as part of our ongoing contractor community outreach efforts. DOE has also faced difficulties finding supplies of stainless steel piping and other materials that meet the stringent requirements required by NQA-1, the materials and constructions standards for nuclear facilities. However, all contractors must be capable of meeting the stringent requirements driven by nuclear facility construction and the operational rules put in place in the interest of public health and safety.**

## **QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 5. The GAO has stated that while the Department's baseline change proposal process requires documentation explaining the proposed change and why it is necessary, it does not require a root cause analysis of why the initial contract did not anticipate the factors that led to the need for modification.**

**Q5: Why doesn't the baseline change proposal report require any root cause analysis to determine why the original estimate failed to anticipate the cost?**

**A5: DOE has established a rigorous contract change and project baseline change approval process that requires a detailed analysis of what caused the baseline change and an independent assessment of the impacts when certain thresholds are exceeded. Section 3.2.3 of DOE G 413.3-20, *Change Control, management Guide*, describes the steps for a Project Performance Baseline Change Process. A typical Baseline Change Proposal (BCP) package—which is generally drafted by contractor personnel and submitted for approval to the federal project team —includes:**

- 1. Reason/Justification: An explanation of the need for the change, which is frequently attributable to Design Development; Risk Mitigation; Realization of Risk; External changes; or Poor performance.**
- 2. Schedule Milestone Impact Statement: A statement that includes schedule revisions and explanations of milestone and date changes with "from" and "to" versions.**
- 3. Management Reserve, Contingency, Undistributed Budget or Additional Budget Requirements: An explanation of the impact of the change on project cost.**

**Work Breakdown Structure Affected: The BCP includes identification of Work Breakdown Structure (WBS) elements affected as a result of the change. The WBS is a method of**

breaking the total work to be performed under the contract into small units that have specific cost, schedule and performance criteria that can be separately tracked through completion by contractor management.

### **QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 6. One reason for DOE's poor cost estimates is that EM has initiated construction of facilities before completing their design, also known as the "design-build" model.**

**Q6: Besides legacy projects, has the Department discontinued the "design-build" practice?**

**A6: DOE has established a policy that requires the project design to be sufficiently mature and a project cost estimate with a high degree of confidence to be developed before construction begins. EM requires nuclear capital asset projects to complete 70-90% design prior to requesting baseline approval. In determining the sufficiency of the design level, factors such as project size, duration, and complexity are considered.**

**For basic facilities, such as administrative buildings, general purpose laboratories, and utilities, the design does not have to be as mature as for a complex chemical or nuclear processing facility. For projects that have well-defined requirements with limited complexity and risks, a design-build acquisition approach may be appropriate. Example projects include road construction, administrative facilities and/or replication of previously accomplished projects.**

**DOE Order 413.3B requires aggressive risk mitigation strategies for close-coupled or fast-tracked design-build projects. Risk management strategies must be outlined in the Risk Management Plan and at a minimum must address: all technical uncertainties; the establishment of design margins to address the unique nature of the design; and increased technical oversight requirements.**



**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 7. Cost-plus contracts require that an agency exercise significant oversight over the contract to ensure that it is paying only for allowable costs. Yet EM refers to its oversight as being “arms-length.”**

**Q7: What does “arms-length” oversight mean?**

**A7: “Arms-length” means that DOE maintains organizational distance from its contractors to provide objective oversight to protect the taxpayer’s interests.**

### **QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 8. Most of EM's contracts use an award or incentive fee contract, but it does not appear that the fees paid realistically reflect contractor performance.**

**Q8a: How do you ensure that incentive fees are structured so that they are only awarded when performance goals are met?**

**A8a: DOE tailors the incentives used under each contract to meet the requirements of the work under the particular contract. This requires analysis of what meaningful, verifiable, and completed work will serve as milestone for the desired outcomes of the contract or project under the contract. The Deputy Secretary of Energy's December 13, 2012, policy on aligning contract incentives for capital asset projects requires that performance measures link all or a substantial portion of the fee to the achievement of final outcomes rather than interim accomplishments. EM contracts are structured such that all or a significant portion of the fee for interim milestones will be provided provisionally and must be returned if the contractor does not fulfill its ultimate contractual obligations in accordance with the terms of the contract.**

**When DOE can estimate the total cost to perform a contract with reasonable certainty, the Department uses hard cost caps or cost share. If a contractor does not meet performance targets within the cost goals, the cost cap or cost share will shift the cost burden to the contractor. In this context, the contractor must still perform regardless of the costs it incurs and DOE will not reimburse any costs or reimburse only a portion of the costs beyond the stated amount as set forth in the contract, subject to certain legal limitations.**

### **QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

**Q8b: How often does EM use penalty clauses in contracts to penalize contractors who do not perform adequately?**

**A8b: The Deputy Secretary of Energy's December 13, 2012 memorandum on aligning contract incentives for capital asset projects provided policy guidance on the structure of incentives for new contract awards: First, no contract should be structured to reward contractors if the taxpayers are not well served. Second, the Department will structure contracts so that the contractors will bear responsibility for their actions (i.e. taxpayers should not pay for contractor negligence, poor performance, or error but share in savings or gains that they generate through better-than-promised performance).**

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

**Q8c: What is DOE's policy on providing equitable adjustment to contractors when they have been unable to earn incentive fees through no fault of their own?**

**A8c: If the contractor is entitled to an equitable adjustment under the contract due to a differing site condition, a change in the contract requirement, or other situation, the Contracting Officer considers the cost, schedule, and contract requirement changes necessary to place the contract in the same relative position it had been in regarding cost, schedule and technical performance achievement before the change to the contract. However, the Department follows the "no rollover" policy for award fee in the Federal Acquisition Regulation. A contractor never receives a second opportunity to earn award fee if due to its own failings it misses target dates or performance requirements tied to incentives.**

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

9. **The cost of the Waste Treatment Plant at Hanford has soared from \$4.3 billion to \$13.4 billion, and the GAO has indicated the cost may rise again. The Department's own guidelines, the DOE 413.3 Series, calls for baseline and requirements changes to be processed individually by the site Program Director and the Acquisition Executive.**

**Q9: Can you verify that all the Waste Treatment Plant contract modifications were approved in accordance with these guidelines?**

A9: The WTP project baseline for the current capacity was established in April 2003 at \$5.781B. This baseline was changed in December 2006 to \$12.263B. Both of these actions took place with appropriate approvals. All contract modifications have been within the bounds of these approved baselines and were properly authorized.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 10. The GAO has stated that, besides the ultimate cost and final completion date for the Waste Treatment Plant, it is concerned whether the plant will ever be successful given that several critical technologies have not been tested and verified.**

**Q10: How does DOE determine whether it is chasing the technologically impossible?**

**A10: The current pause in construction activities for the Pretreatment and High Level Waste facilities is to allow for adequate testing to confirm aspects of the design that are currently unresolved. The technology being implemented as part of the WTP project has been used in other facilities. That technology must be extended and adapted to the circumstances at the WTP. What has not yet been proven is how that technology will react with the waste currently identified in the existing tank farms. The main area of focus is the testing to be performed with the pulse jet mixers. The current test plan will utilize full scale vessels. This will provide test results from actual vessels that will be used in the WTP. The results are expected to identify the limits of the mixing capability, if any, of the pulse jet mixers with the WTP waste.**

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 11. The House version of the National Defense Authorization Act contains a provision requiring the Secretary of Energy to submit a plan to Congress for the Waste Treatment Plant at Hanford.**

**Q11: Does the Department support this provision?**

**A11: As Secretary Moniz has noted, the development of a plan for not just the Waste Treatment Plant, but also for the entire Office of River Protection's mission is a top priority at the Department. As DOE works to finalize a plan within the constraints imposed by the consent decree process, DOE plans to share the plan with all affected stakeholders, including Congress.**

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 12. In your testimony, you indicated that EM had completed approximately \$144 billion of non-Recovery Act worth of contract work since 1990, and that approximately 50% of those projects had come in over the original cost estimates.**

**Q12: What percentage of that \$144 billion in contract work surpassed original cost estimates?**

**A12: EM's early work was largely comprised of extensive characterization of contaminated sites and risks, analysis of cleanup alternatives, level-of-effort landlord activities, and planning for the cleanup work needed at the sites. The first comprehensive estimates of EM's projected cleanup scope, cost, and schedule were developed in the mid-1990s. EM relied mostly on large, site-wide, cost reimbursable Management and Operating (M&O) contracts for cleanup work, until the transition in more recent years to largely non-M&O contracts. Prior to that transition, a cost baseline was generally not established for the contract itself, as it is now. In 1997-1998, EM organized the cleanup work scope into projects, establishing Project Baseline Summaries as a construct to capture programmatic information associated with the cleanup projects, including estimated life-cycle cost, schedule and scope required to complete the projects. Since that period many of the projects were rebaselined, often with changes to cleanup scope due to regulatory agreements or other factors. Therefore, EM does not have comparable data on the actual costs due to the project baseline changes over time.**



**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 13. In your testimony, you indicated the K-25 project went from an original baseline of approximately \$500 million to a rebaselined cost of approximately \$1.3 billion.**

**Q13: What was the original baseline of the K-25 project and what were the dates and costs of subsequent rebaselines of the contract?**

**A13: The original project management baseline of the K-25 project was cost \$ 479.4M and schedule September 2017. This was established on April 8, 2010 based on the programmatic baselines that were approved on February 13, 2008. The subsequent revised baseline of the K-25 project had a cost of \$1.397B and a revised schedule for completion of December 2015. This rebaseline was approved on November 30, 2011. We expect the project will be completed approximately \$300M below the approved cost.**

### **QUESTION FROM RANKING MEMBER RON JOHNSON**

**Q1: Has DOE ever not accepted a Defense Nuclear Facility Safety Board (DNFSB) recommendation? Does DOE ever provide input to DNFSB recommendations to make them more practical or cost-effective?**

A1: While DOE has never completely rejected a DNFSB recommendation there have been two instances where DOE partially rejected recommendations made by the DNFSB. In the 1996 for Recommendation 95-2, *Safety Management*, DOE accepted part of the recommendation but rejected one aspect of which called for the Department's "Safety Management Plans" to be "structured on the lines" of certain Board Technical Documents citing the need to maintain a flexible approach to these activities. Also, in 2000 for Recommendation 2000-1, *Stabilization and Storage of Nuclear Materials*, DOE accepted 9 of the recommendations total 11 sub-recommendations. In this case the DOE rejected the Board's specific call for DOE to account for costs from prior recommendation actions.

In addition as recently as 2010 DOE formally accepted one recommendation, DNFSB Recommendation 2010-2, *Pulse Jet Mixing at the Waste Treatment and Immobilization Plant*, which the DNFSB considered to be a partial rejection prompting DOE to clarify their acceptance.

With respect to providing input to the DNFSB on recommendation practicality and cost effectiveness, EM has engaged the DNFSB staff in discussions on the practicality and cost impacts through the development of subsequent implementation plans to address the recommendations.

## **QUESTION FROM RANKING MEMBER RON JOHNSON**

**Q2: In your testimony, you noted the cost and schedule problems at the Hanford Waste Treatment Plant (WTP) and Savannah River Salt Waste Processing Facility (SWPF). You and several other witnesses described how mid-project design changes played a major part in these overruns, such as the scaling up of the WTP from treating 40% to treating 100% of the waste in the tanks at Hanford. Provide timelines for both the WTP and SWPF of major decisions (by DOE and others) that increased the scope or otherwise changed requirements, including a short description of the reasons behind each change. To the extent possible, estimate the cost and schedule impact of each of these decisions.**

**A2: SWPF: The general scope of the SWPF project has remained constant. However, technical issues have resulted in changes to both cost and schedule over the life of this project. The first issue was identified based on discussions with the Defense Nuclear Facilities Safety Board (DNFSB), additional design activities, and interactions with stakeholders and regulatory bodies. DOE then determined that certain processing areas of SWPF should be designed to meet seismic Performance Category 3 (PC-3), rather than PC-2 criteria and to apply more stringent nuclear QA requirements. This increased the cost from a range of \$375M to \$440M at Critical Decision (CD)-1, (Approve Alternative Selection and Cost Range), to an approved Total Project Cost (TPC) of \$899M at CD-2, (Approve Performance Baseline), and changed the schedule to achieve CD-4, (Approve Start of Operations/Project Completion), from February 2009 to November 2013. At that time the facility was at approximately 35 percent design complete for a first-of-a-kind nuclear facility.**

**Upon reaching the 90 percent design complete, the TPC approved at CD-3, was increased in January 2009 to \$1,339M; and CD-4 was approved at October 2015. The cost impact**

of more stringent nuclear QA requirement application, the limited vendor pool for nuclear work, and a shortage of qualified nuclear design engineers, which caused project delays and increased costs, were cited as the basis for this cost increase. These changes directed by DOE ultimately resulted in an \$899M increase to TPC from the original \$440M and a schedule change of over 6½ years. The most recent change to the project is the result of poor performance by Parsons to fabricate 10 large vessels that needed to meet American Society of Mechanical Engineers requirements. In October 2010, Parsons terminated the subcontract with the vendor with no usable vessels. Parsons contracted with a new vendor to fabricate the vessels at an accelerated schedule (8 - 9 months) in an effort to maintain the project's schedule. The vessels were delivered and installed in May/June 2012 after approximately 18 months. In an attempt to keep construction momentum during this period, Parsons re-sequenced construction activities to mitigate the impacts of vessel delays. While construction progress continued, it did not mitigate the time lost by the vessel schedule delays. As a result, the project is experiencing a slip in schedule. A contract modification for completion of construction was negotiated at \$530M, a net increase of \$330M. A cost cap was established to limit DOE's financial liability for construction costs with a target construction completion by December 2016. The project is currently commencing negotiations with Parsons for the remainder of the contract scope covering commissioning (the remaining scope of the project), one year of operations, and six months support. While there have been no scope changes, the impacts of schedule delays, the increase in construction completion costs, and the estimate for commissioning activities will result in an increase to the project cost.

DOE is developing plans for finalizing the dates for commissioning and initial operations; project completion will not be achieved until after commissioning.

**WTP:** The Hanford Waste Treatment Plant's (WTP) original plan as a privatized venture allowed for construction to commence in December 2000 and hot operations were to start in December 2007 to treat approximately 10% of the tank waste (by mass) and 25% of the tank waste radioactivity inventory. The privatization effort was cancelled and Bechtel National Incorporated (BNI) was awarded a contract in December 2000 to construct the same size facility at an estimated cost of \$4.35B with a target completion date of December 2007. In April 2003, Modification A029 was negotiated with the principal change of increasing the throughput capacity of the Pretreatment (PT) and High-Level Waste (HLW) Facilities to complete the entire mission, thereby eliminating the need for a second treatment complex. The WTP cost at this time increased to \$5.781B with a completion date of July 2011. This cost of \$5.781B and schedule completion date of July 2011 was established as the project baseline as defined in DOE O 413.3.

On December 22, 2006 a Baseline Change Proposal (BCP) was approved by the Deputy Secretary of Energy based on evaluation of design and engineering changes, risks, and modifications submitted by the contractor BNI. This increased the Total Project Cost to \$12.263 Billion and established a new completion date of November 2019. The impact of this BCP increased the project cost by \$6.482B. This change was initiated in March 2005, when technical issues such as the criteria used for seismic design and the pulse jet mixers were identified as causing significant cost increases. Construction on the PT and

HLW facilities was stopped pending resolution of the seismic design basis. Construction resumed after approximately a year and a half. This impact was factored into the re-baseline. The resulting new baseline included cost impacts such as approximately \$670M for resolution of the technical issues, \$1,315M for time related costs such as escalation, \$745M for other design evolution costs, approximately \$540M for cost increases in labor and material, approximately \$2,415M for contractor management reserve/fee and DOE contingency, \$135M for other DOE costs, and approximately \$663M for other contractor costs.

### **QUESTION FROM RANKING MEMBER RON JOHNSON**

**Q3: In response to a question, you addressed the cost impact of the DNFSB's changes to the Integrated Waste Treatment Unit (IWTU) project at the Idaho National Lab, estimating that it was approximately \$20 or \$30 million. Please provide a more exact estimate of the impact. What is this cost impact estimate based upon? Does it include the cost of the year-plus delay?**

**A3: In implementing DOE-STD-1021-93 Natural Phenomena Hazards Performance**

**Categorization Guidelines for Structures, Systems, and Components, the Department upgraded the safety-class structures, systems, and components from Performance Category (PC) 2 to PC 3 to provide adequate protection of workers, the public, and the environment. This was a DOE decision done in cooperation with DNFSB. Changing the design basis for the IWTU facility had a significant impact to the project cost and schedule. The actual cost impact was \$130 M due to the design changes and schedule delays. This cost impact is actually not a cost estimate; it is based on the contractor's actual cost that was paid to the contractor. The \$130 M impact represents the cost of the PC 2 to PC-3 design change and construction cost, and the one year plus delay. The portion of \$130 M due to the schedule delay was \$16 M.**

#### **QUESTION FROM RANKING MEMBER RON JOHNSON**

**Q4: Much of the work on the WTP has been “paused” since last year while DOE assesses how to address identified technical challenges. When does DOE anticipate that this pause in work will be lifted? Does DOE anticipate that it will be able to identify solutions for all of the technical challenges identified by the DNFSB?**

**A4: Construction on the PT Facility and certain portions of the HLW Facility has been halted while the technical review teams complete their reviews and analyses. Limited construction is underway in the HLW Facility in areas not affected by the technical issues. Construction can resume in the affected areas of the HLW Facility and the PT Facility once technical issues are resolved. Testing is currently being planned for the HLW technical issues. Technical issue resolution and alignment of the design with the safety bases is a primary focus in 2014 for the HLW facility. DOE will be in a position ramp up HLW construction after that as the issues are resolved and the alignments are completed.**

**All of the technical issues identified by the DNFSB are being addressed. A major emphasis of a Design Completion Team assembled to address the unresolved technical issues is mixing, which is also a concern of the DNFSB. Five sub teams under direction of the Design Completion Team comprised of DOE, contractor, members of the national laboratories and other technical experts have been tasked to develop solutions and alternatives to the issues, and identify a path forward to resolution. Construction work will not resume on the Pre-Treatment Facility until the resolution of the technical issues is completed.**



1 contractors--the some 100,000 contractors that are employed  
2 at the Department of Energy--what percentage of those would  
3 you estimate are working on the environmental cleanup and  
4 environmental management?

5 Mr. Friedman. My understanding--it is 30,000.

6 Senator McCaskill. Thirty thousand. So those 30,000  
7 would have to be reassigned to another department of  
8 government, or we would just--

9 Mr. Friedman. No. Maybe I--perhaps I misunderstood  
10 your original question.

11 The functions that they are carrying out--cleaning up  
12 the sites that have been talked about here today--from my  
13 point of view, certainly, we have a moral obligation to  
14 continue that, whether we do it with the same contractors,  
15 different contractors or federalize it, if that is where we  
16 are heading.

17 Senator McCaskill. Right. Okay.

18 Mr. Friedman. There is that possibility.

19 Senator McCaskill. Okay. I know you mentioned, Mr.  
20 Surash, that there have been some contracts that have come  
21 in on top and at budget. But, historically, what percentage  
22 of the contracts would you say have come in at or near the  
23 cost estimate that was given at the beginning of the  
24 contract?

25 Mr. Surash. I just want to check my--ma'am, off the

1 top of my head, I do not have that number, but I will be  
2 happy to provide that.

3 Senator McCaskill. Well, can we do a ballpark?

4 I mean, I would assume that most of the contracts in  
5 this area have not come in at estimate based on our research  
6 we have done.

7 Mr. Surash. Well--

8 Senator McCaskill. The nuclear cleanup contracts.

9 Mr. Surash. If I go back, if I looked at the work--\$6  
10 billion worth of work--done during the Recovery Act time,  
11 2009 to 2011--

12 Senator McCaskill. I am looking at the \$150 billion of  
13 work that has been done since 1990. How much of that?

14 Let's take the stimulus out of it.

15 Mr. Surash. Okay.

16 Senator McCaskill. And, good for you, that those  
17 contracts came in at estimate and on schedule.

18 Let's take that \$6 billion out and do the other \$140-  
19 some billion. How many--what percentage if you had to--and  
20 I will not hold you to this. I am just curious.

21 Are you comfortable in saying that certainly more than  
22 50 percent of them have not come in on estimate, or more  
23 than 70 percent?

24 Mr. Surash. I am just guessing. I will provide the  
25 number for the record, but I was going to say approximately

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EM's early work was largely comprised of extensive characterization of contaminated sites and risks, analysis of cleanup alternatives, level-of-effort landlord activities, and planning for the cleanup work needed at the sites. The first comprehensive estimates of EM's projected cleanup scope, cost, and schedule were developed in the mid-1990s. EM relied mostly on large, site-wide, cost reimbursable Management and Operating (M&O) contracts for cleanup work, until the transition in more recent years to largely non-M&O contracts. Prior to that transition, a cost baseline was generally not established for the contract itself, as it is now. In 1997-1998, EM organized the cleanup work scope into projects, establishing Project Baseline Summaries as a construct to capture programmatic information associated with the cleanup projects, including estimated life-cycle cost, schedule and scope required to complete the projects. Since that period many of the projects were rebaselined, often with changes to cleanup scope due to regulatory agreements or other factors. Therefore, EM does not have comparable data on the actual costs due to the project baseline changes over time.

1 take us to recruit them because our recruitment system is so  
2 efficient here in the Federal Government. It might be 10  
3 years from now before we get the first 200. But how we use,  
4 the contrary is, the people we have working for us.

5 I guess the question is I know when I was mayor, and we  
6 would scope projects. And there was a constant situation  
7 where we had someone who was scoping the project, and the  
8 bids came in much higher than the estimates. That person  
9 did not work for us after a little period of time.

10 So how is internally your operation doing this?

11 Mr. Surash. Yes, sir, let me try to give you a sense  
12 of that. I will talk about--

13 Senator Begich. Let me pause you because I know one  
14 other issue Senator McCaskill and I had when I was on Armed  
15 Services was the F-35, which had questions of its scoping  
16 capacity. And it almost doubled, I think, per unit price,  
17 if I remember right.

18 And they had to make some changes over there from the  
19 top-down, if I remember right--general-down. But that had  
20 never been done before.

21 So I am curious; how is it working

22 Mr. Surash. So let me try to answer it this way, if I  
23 may. I will talk about contracting authority and approval  
24 of a project.

25 So, on the contracting side, our sites--and there are

1 approximately 6 large sites--

2 Senator Begich. Correct.

3 Mr. Surash. --have \$25 million of change authority.

4 So any contract action, whether it is a new contract or  
5 a change, up to \$25 million, they can deal with. That is a  
6 lot.

7 Senator Begich. Cumulative or individual change?

8 Mr. Surash. Each item. That is a lot of--

9 Senator Begich. Cumulative, it could be who knows  
10 what.

11 Mr. Surash. Item by item.

12 Senator Begich. Okay. That is still a lot of money.

13 Mr. Surash. Twenty-five million is a lot of money.

14 Now, in the context of \$5.5 billion, it is a relatively  
15 small amount.

16 Senator Begich. Right, but if it is cumulative and you  
17 can--so you start adding up items.

18 Mr. Surash. Absolutely. My authority is \$50 million.

19 Senator Begich. Mm-hmm.

20 Mr. Surash. Above me, it goes into a Department of  
21 Energy Office of Acquisition and Procurement Management.

22 So, at that point, definitely, the rest of the  
23 Department and our General Counsel, et cetera, you know,  
24 have this ability.

25 Senator Begich. But how is the project originally

1    scoped--because I saw when you mentioned the K-25 it was  
2    \$100 million below the rebaseline.

3           Mr. Surash.   Right.

4           Senator Begich.   I am just curious; from the original  
5    to the rebaseline, how much difference in cost increase was  
6    that?

7           Mr. Surash.   If I--

8           Senator Begich.   Because you are basically saving off  
9    of an increase.

10          Mr. Surash.   That is true, and that is why I wanted to  
11   be fair when I said that.

12          Senator Begich.   How much is that increase?

13          Mr. Surash.   Can I--if I may, sir, let me--can I tell  
14   you about the project approval and then answer that, if that  
15   would be okay?

16          Our sites for a project, to approve the baseline--the  
17   baseline is what we are committing to the Congress that we  
18   are going to deliver on.

19          Our site managers have \$100 million of authority.   My  
20   Assistant Secretary has \$400 million.   Anything above \$400  
21   million is above him.   We have a Undersecretary.   We have a  
22   Deputy Secretary.

23          And so they have--

24          Senator Begich.   Okay.

25          Mr. Surash.   They are involved in that.

1           If I may, for the--I will give you very rough numbers,  
2 but I can, for the record, give you the exact numbers.

3           Senator Begich. That would be great.

4           Mr. Surash. For that K-25 project, I believe it was  
5 about \$500 million original baseline cost, circa 2008.

6           Senator Begich. Mm-hmm.

7           Mr. Surash. And the rebaseline was approximately \$1.3  
8 billion.

9           So I mean, again, to be fair, I said that we are three  
10 or four

11          Senator Begich. Let me pause you there.

12          Mr. Surash. Yes, sir.

13          Senator Begich. Who did the original baseline?

14          That is what I am trying to get to because here is my  
15 question; we do not have a good habit in the Federal  
16 Government.

17          I mean, I will not get on my CBO rant, but they are  
18 always off 20 percent, which--I do not know--is a couple  
19 hundred billion a year on the deficit.

20          But, you know, it seems around here \$200 billion seems  
21 to be small change according to some people, not to me, but--  
22 --so who does the original scoping to develop the baseline?  
23 Is that internal?

24          Mr. Surash. The way this would work is it starts with  
25 the contractor. That is who is doing the work.

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The original baseline of the K-25 project was \$479.4M cost and September 2017 completion date. The subsequent revised baseline of the K-25 project had a cost of \$1.397B and a revised schedule for completion of December 2015. This baseline change was approved on November 31, 2011. We expect the project will be completed approximately \$300M below the revised baseline cost.



1   there is we actually have a pilot-scale plant that has been  
2   in operation for several years that is using the exact  
3   technology that this much larger, billion-dollar-plus plant  
4   is going to use.

5           So that is an example of the sorts of things that we  
6   should do.

7           Senator McCaskill.   Okay.   So you are getting--you  
8   understand this is a problem, and you understand this is an  
9   issue, and you understand the investment in small-scale will  
10   pay for itself multi-times over rather abandoning something  
11   that you go to large scale without the proper small-scale  
12   test.

13          Mr. Surash.   Absolutely, and this is part of this tug  
14   on getting on with work versus doing it right.

15          A pilot plant will actually cost a little bit more  
16   money up front.   It will take more time.   But we have  
17   learned the hard way for the first-of-a-kind nuclear, very  
18   complicated projects that we really need to do this or else  
19   we are asking for trouble and we are rolling the dice down  
20   the road.

21          Senator McCaskill.   Do you believe, Mr. Friedman, that  
22   they are doing better on this front?

23          Mr. Friedman.   I think, frankly, there have been a  
24   number of actions which I think are admirable and which we  
25   certainly agree with in seeing from our history, but I think

1 the jury is out. We are going to have to wait and see. I  
2 cannot--at this point, I cannot give you confirmation of  
3 that.

4 Senator McCaskill. The number of prime contractors--I  
5 want to make sure I understood your testimony correctly. We  
6 are not seeing a shrinkage; we are actually seeing an  
7 increase?

8 Mr. Surash. We have seen a little bit of an increase,  
9 and I would say mainly on the smaller contractors. Off the  
10 top of my head, I cannot think of a very large new firm that  
11 has entered the picture.

12 If I am mistaken, I will provide--

13 Senator McCaskill. And what about subs?

14 Mr. Surash. Ma'am, our privative contract, as you are  
15 aware, is with the prime contractors. There seems to be--I  
16 am not aware of issues with lack of subcontractors or lack  
17 of competition. So that seems to be going okay.

18 In some cases, you know, for instance, the Oak Ridge  
19 project I was talking about before, the way we structured  
20 that is we wanted 60 percent of the work to be done by  
21 subcontractors, and that seems to be working out relatively  
22 well.

23 Senator McCaskill. You know what is interesting to me  
24 is, having spent so much time in the defense space, you have  
25 a wealth of competitors compared to some space at DoD. A

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We have reviewed the number of potential offerors who have shown interest in Environmental Management's (EM) acquisitions over the last three years. From this we have been able to show the average per procurement has remained steady.

Contractors typically form Limited Liability Corporations (LLC) for our larger projects. Over the past 10 years, the major partners in those LLCs have remained stable, generally comprised of offerors such as Babcock and Wilcox, Bechtel, and CH2M Hill. There have been a few smaller prime contractors that have entered the picture in this time such as Portage. Reviewing these numbers has shown they have stayed relatively the same over this duration.

1 contract awarded in 2000. And what I want to point out  
2 there is that was for a plant that would operate for 40  
3 years and treat about 40 percent, by volume, of the  
4 radioactive waste out there.

5 The plant today will treat 100 percent of the high-  
6 level waste, 40 percent of the low-level waste and operate  
7 for 50 years. So that is partially the reason for this cost  
8 growth. We actually are increasing the scope of what can be  
9 provided.

10 To answer your question on the waste treatment plant,  
11 that is currently a single contract still today. It was  
12 originally awarded in 2000.

13 Senator Johnson. Okay. It is Hanford where we are  
14 actually getting leakage right now, too, isn't it?

15 Mr. Surash. That is correct. That is--actually, there  
16 is a separate contractor that is managing the underground  
17 tanks where we have some suspected leaking tanks.

18 Senator Johnson. That is definitely heightening the  
19 concern in trying to--everybody is trying to speed this  
20 process up to address that fact.

21 Mr. Surash. Yes, sir, absolutely.

22 Senator Johnson. Let's go to the Safety Board a little  
23 bit in terms of its impact on cost and scope and those types  
24 of things.

25 Mr. Bader, in the Safety Board's recommendations, is

1    there any cost-benefit analysis done to your  
2    recommendations?

3           Mr. Bader.   There is not.

4           Senator Johnson.   What guides your recommendations  
5    then?   Strictly, public safety?

6           Mr. Bader.   First of all, we look at the public safety  
7    and try and be sure that there is adequate protection.   In  
8    doing that, we consider the technical and economic  
9    feasibility but do not do a cost-benefit analysis.

10          Senator Johnson.   Mr. Surash, has any recommendation  
11   from the Safety Board ever been turned down or pushed back,  
12   or let's say first, turned down?

13          Mr. Surash.   Sir, that is a little bit out of my area  
14   of expertise, but I can provide that for the record.   There  
15   may have been.

16          Mr. Bader may--

17          Senator Johnson.   Mr. Friedman, are you aware of any  
18   recommendations from the Safety Board being turned down?

19          Mr. Friedman.   I do not know specifically, Senator.

20          Senator Johnson.   So--

21          Mr. Friedman.   I do not know one way or the other.

22          Senator Johnson.   Okay.   It would be my concern if you  
23   have a Safety Board.   Again, I think we are all concerned  
24   about safety, but if they are operating outside any kind of  
25   cost-benefit analysis, one of my concerns--I know in Idaho

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There has not been any instance of DOE rejecting or turning-down a DNFSB recommendation in its entirety. There have, however, been three instances where a DNFSB recommendation has been partially accepted.

1 one project was the Idaho National Laboratory.

2 I know a Safety Board recommendation was to take into  
3 account a seismic event, and so that project was stopped  
4 dead for at least a year and a half to basically redesign a  
5 plant that was scheduled, I think, to operate for 18 months.

6 Now I believe those were tanks that were there, that  
7 have been sitting there for decades, also certainly at risk  
8 in terms of seismic events, but now we are going to clean it  
9 up, hopefully, in the span of about 18 months.

10 And then the Safety Board recommends, no, we have got  
11 to include all this rebar, all these construction codes,  
12 construction techniques, to really prevent damage in a  
13 seismic event.

14 Is that part of the problem there?

15 Mr. Surash. Sir, if I can answer, that actually  
16 happened at the integrated waste treatment plant in Idaho  
17 that you were mentioning. We came across that on the salt  
18 waste processing project and also the waste treatment plant.

19 And this--the root of all this has to do with this  
20 proper up-front planning. You know, we really need to  
21 mature the design, work with regulators and oversight  
22 organizations before we start building. But we did not, and  
23 what you--happened, you know, is accurate.

24 Senator Johnson. Do you know what the cost of that was  
25 in terms of reinforcing that building for seismic events?

1           Mr. Surash. I will provide a very accurate number for  
2 the record, sir. It was--

3           Senator Johnson. Ballpark?

4           Mr. Surash. Just a wild guess, maybe \$20 million or  
5 \$30 million.

6           Senator Johnson. Okay. Well, unfortunately, in the  
7 scheme of things, that is not that big a number in terms of  
8 what we are spending.

9           Mr. Bader, do you want to comment on that?

10          Mr. Bader. We did not make a recommendation. We had a  
11 letter, which we would call a project letter, which was  
12 issued. And, actually, if you would like us to submit it  
13 for the record, I have a copy here.

14          And we were actually largely in agreement with the  
15 project through DoE on the seismic requirements.

16          Senator Johnson. Okay. I guess maybe I should ask you  
17 this question; are there any safety recommendations that you  
18 made that DoE has either pushed back on or simply declined  
19 to enact?

20          Mr. Bader. There was one recommendation which was  
21 partially rejected by the Secretary but which he said he  
22 would actually respond in his implementation plan in a  
23 manner that would meet our concerns.

24          Senator Johnson. Out of how many recommendations have  
25 you put forward since your establishment--a ballpark?



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The actual cost impact for changing the design basis of the project from Performance Category (PC) 2 to PC 3 was \$130 million, inclusive of cost increases due to schedule delays. The \$130 million impact represents the cost of the Performance Category (PC) 2 to PC-3 design and construction cost, and the one year plus delay.

It is important to note that the decision to change the design basis to PC 3 was made before establishing the original cost baseline of the project of \$461.6 million and included approximately \$100 million for moving from PC2 to PC3. The primary driver behind DOE's decision to go from PC 2 to PC 3 was to build into the IWTU facility, an additional capability to support future modification of the facility to process calcine waste. This decision was made to avoid the cost of building an entirely new facility for calcine, and smartly re-use the IWTU facility which was only planned for a 10 month production run.

Also, important to note is that when a revised project baseline of \$550.9 million was approved in December 2008, \$30 million of the approximately \$89 million cost increase was due to PC 3 design and structural complexity.



**Department of Energy**  
Washington, DC 20585

March 27, 2014

The Honorable John Shimkus  
Chairman  
Subcommittee on Environment and the Economy  
Committee on Energy and Commerce  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On July 31, 2013, Secretary Ernest Moniz testified regarding "Oversight of DOE's Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste."

Enclosed are the answers to 25 questions that were submitted by Representatives Bilirakis, Dingell, and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher E. Davis", is positioned above the printed name.

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Paul Tonko, Ranking Member



**The Honorable John Shimkus**

- Q1.** In your response to my June 28<sup>th</sup> letter, you attached a table that listed the laws under which you believe each used fuel activity is justified. Some were listed as authorized under the NWPA and others under the Atomic Energy Act of 1954 (AEA). It is clear that, in the NWPA amendments enacted in 1987, Congress directed DOE not to conduct further repository research on sites other than Yucca Mountain.

In its decision on *United States v. Estate of Romani*, the U.S. Supreme Court stated:

“...a specific policy embodied in a later statute should control our construction of the [earlier] statute, even though it ha[s] not been expressly amended.”

- a.** Please explain why DOE believes it has the authority to follow some sections of the NWPA and ignore others.

**A1a.** DOE does not believe that it has the authority to follow some sections of the NWPA and ignore others. None of the activities listed in the response to your June 28<sup>th</sup> letter (the “July 22<sup>nd</sup> Response”) involve site-specific research on potential repository sites and, therefore, none are prohibited by section 160(a) of the NWPA.

- b.** Please explain how DOE’s reliance on the AEA is consistent with the Supreme Court’s decision in *United States v. Estate of Romani*.

**A1b:** The NWPA does not repeal DOE’s authority under the AEA to conduct research and development related to the disposal of used fuel and high-level radioactive waste. Rather, the NWPA creates a framework that limits the extent to and manner in which DOE can exercise this authority in certain situations. For example, section 160(a) prohibits DOE from conducting site-specific activities, including research and development, at a repository site other than Yucca Mountain. But there is no provision in the NWPA that prohibits DOE from conducting generic activities, including research and development that would

relate to different media rather than specific sites. Therefore, reliance on the AEA as a source of authority is not inconsistent with the Supreme Court decision in Romani or contrary to the framework established by the NWPAs.

Q2. In your response to my June 28, 2013 letter you provided a table citing the Nuclear Waste Policy Act (NWPA) as providing the authority for DOE's interim storage activities. However, DOE's 2008 "Report to Congress on the Demonstration of the Interim Storage of Spent Nuclear Fuel from Decommissioned Nuclear Power Reactor Sites" states that:

"...Section 141 of the NWPA... authorized the Department to site, construction, and operate a monitored retrievable storage (MRS) facility but restricted the ability of the Department to pursue this option by linking any activity under this section to milestones tied to progress in the development of the Yucca Mountain repository."

a. Given that DOE has shut down the Yucca Mountain program, please explain how you can justify DOE's interim storage activities as authorized under the NWPA.

A2a: The 2008 Report to Congress on the Demonstration of the Interim Storage of Spent Nuclear Fuel From Decommissioned Nuclear Power Reactor Sites ("2008 Report") correctly notes the linkages in the NWPA between an MRS and a repository at Yucca Mountain. The authority provided by section 142(b)<sup>1</sup> to site, construct, and operate an MRS is subject to the conditions in sections 143 through 149, which include milestones on the development of a repository. The activities identified in the July 22<sup>nd</sup> Response are preliminary activities that would be useful in considering sites for an MRS in the future. As such, these activities would occur prior to the activities related to an MRS that are linked to repository milestones. All of the activities identified in the July 22<sup>nd</sup> Response are consistent with the 2008 Report and the framework of the MRS provisions of the NWPA.

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<sup>1</sup> The 2008 Report should have referenced section 142(b), not section 141 of the NWPA. Section 142(b) of the NWPA authorizes DOE to site, construct, and operate an MRS facility subject to the restrictions set forth in sections 143-149.

b. Please explain the rationale for revising DOE's interpretation of this authority under the NWPA.

A2b. As explained in A2a above, the activities DOE is currently undertaking are consistent with the interpretation it provided in the 2008 Report. Nothing in the 2008 Report related to DOE's ability to undertake preliminary activities that were not constrained by the repository milestones set forth in the NWPA.

c. Please list the sizes of the facilities DOE is currently evaluating for both the pilot plant and the "larger" facility.

A2c. DOE is considering a capacity of 10,000 metric tons of heavy metal (MTHM) for a pilot facility based on the current and projected number of shutdown reactors between now and 2021. It is anticipated that there will be as much as 7,000 MTHM stored at shutdown reactors by 2021.

The Administration's *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste* (Administration's Strategy) also proposes a larger interim storage facility to be available by 2025.

d. Please list the limits on the size of an MRS as stated in the NWPA.

A2d. A Monitored Retrievable Storage facility is limited to 10,000 metric tons of heavy metal (MTHM) until the beginning of operations of the geologic repository, and is limited to 15,000 MTHM thereafter.

Q3. Does DOE need to expend any money to support the NRC's issuance of the complete Safety Evaluation Report?

A3. DOE will evaluate and respond to any requests by the Nuclear Regulatory Commission as the NRC works to complete the Safety Evaluation Report.

**Q4.** On June 22, 2012, DOE told the Court in *In re Aiken County* that it has approximately \$17 million in unobligated nuclear waste disposal carryover funds, as well as approximately \$8 million in obligated carryover funds, that it could use for the Yucca Mountain licensing proceeding, if the proceeding were ordered resumed. Is that money still available? If not, please detail the purposes for which it was expended.

**A4.** The remaining resources available to the Department from Fiscal Year 2010

appropriations as of July 30, 2013 are listed in the table below:

**Prior Year Funds**

	Unobligated	Obligated Uncosted	Total
Defense Nuclear Waste Disposal	\$ 8,590,655	\$ 14,229,473	\$ 22,820,128
Nuclear Waste Disposal	\$ 7,149,301	\$ 15,547,411	\$ 22,696,712
<b>Total, Prior Year</b>	<b>\$ 15,739,956</b>	<b>\$ 29,776,884</b>	<b>\$ 45,516,840</b>

The differences in available funding since June 2012 are due to ongoing expenses include pension payments for retired workers, records retention and maintenance, property security and oversight, and remaining relocation expenses for reassigned workers.

**Q5.** In a previous hearing before this Committee, I asked if you were aware of any scientific or technical issues that would prevent Yucca Mountain from being a safe repository. You responded by saying, "This is an NRC decision ultimately to be taken." Do you believe the people of the United States deserve to know what the NRC concluded in its Safety Evaluation Report? If not, please explain how your response conforms to President Obama's memorandums on *Transparency and Open Government*, and *Scientific Integrity*.

**A5.** As previously stated during the hearing, this is an issue for the Nuclear Regulatory Commission to decide.

**Q6.** Is there any currently applicable appropriations legislation that specifically prohibits DOE from using general funds for purposes of supporting the license review or proceeding?

- A6. DOE is unaware of any currently applicable appropriations legislation that expressly prohibits DOE from using general funds for purposes of supporting the license review or proceeding. However, Congress' decision to appropriate no monies from the Nuclear Waste Fund for Yucca Mountain licensing activities is a specific denial of funding – an appropriation of zero for such activities. In light of Congress' history of funding the Yucca Mountain license proceeding through specific appropriations from the Nuclear Waste Fund, it is evident that zeroing out appropriations to DOE from the Fund in FY 2011, FY 2012, and FY 2013 was no oversight.
- Q7. You indicated in the hearing that DOE staff has met with entities who might be interested in hosting facilities. Please explain the authority under which DOE has engaged in these consent-based activities. Please provide a list of all states, counties, local governments, economic development agencies, or any other organizations that DOE staff has met with to discuss their interest in hosting used fuel facilities.
- A7. Various parties have approached the Department to express their views regarding nuclear waste activities and policies. Some of these parties have expressed a potential interest in hosting a nuclear facility in the future as part of a consent-based siting process. As part of conducting the business of the Federal government, the Department conducts meetings with interested parties, including state and local government representatives, private sector companies, and non-profit entities. The Department has not directly solicited input on this matter, but welcomes the expressions of interest and viewpoints as it considers how to proceed in implementing the Administration's *Strategy*.

Furthermore, as discussed above, the NWPFA does not prohibit preliminary activities related to the siting of an MRS such as discussions with representatives of sites that might have an interest in hosting such a facility. The authorities for specific preliminary

activities were identified in the Enclosure to the July 22<sup>nd</sup> Response under the “Legal Authority” column.

- Q8.** DOE has refused to meet with representatives from Nye County, Nevada, in spite of their formal statement notifying DOE of their consent to host a repository. Please explain how DOE’s authority to meet with the entities listed in response to the previous question would not also empower DOE to meet with Nye County representatives.
- A8.** Department staff have spoken with representatives from Nye County on numerous occasions at conferences and stakeholder meetings regarding their interest in hosting a repository or interim storage facility and how they might participate in whatever process eventually emerges to site those facilities. As noted in the answer to Question 7, the Department conducts meetings with interested parties, including state and local government representatives, private sector companies, and non-profit entities as part of its normal course of business. If there is a request from representatives from Nye County, Nevada, to meet, we will certainly honor that request.
- Q9.** The NWPB authorized the Office of Nuclear Waste Negotiator to pursue consent-based siting. Please describe how your vision of consent-based siting differs from DOE’s practical experience and why it would be more likely to yield a positive result, i.e. a repository site.
- A9.** While established in the Nuclear Waste Policy Amendments Act of 1987, the first head of the Office of the Nuclear Waste Negotiator was not confirmed by the Senate until 1990. The Nuclear Waste Policy Act included a sunset date for the Office of Nuclear Waste Negotiator, so authorization and funding for the office expired in late 1994. The short history of this office did not engender confidence on the part of either the nuclear industry or participants in the siting process in the early 1990s.



Any workable solution for meeting our obligation to dispose of used fuel and high-level radioactive waste will need to be both technically sound and have the support of the affected state and communities. Our experience has shown that a site cannot be imposed without public acceptance, as was unsuccessfully attempted with Yucca Mountain. That is why the Blue Ribbon Commission (BRC) report and the Administration's *Strategy* focus on a consent-based siting process.

- Q10. Please describe in detail the results of the consent-based siting process in Great Britain. Please also describe in detail your basis for concluding that a consent-based process would yield a positive result in the U.S.
- A10. Staff from the United Kingdom's Nuclear Decommissioning Authority would be the best sources of detailed information on their siting process. However, it is understood that the UK has yet to find a volunteer community for a geologic disposal facility.

Whatever circumstances may be in the UK, other countries have successfully selected sites for nuclear waste facilities, notably Sweden and Finland. Further, Canada and France both have programs underway to engage multiple levels of governments on siting that appear very encouraging.

With regard to the United States, a top-down approach to executing a national nuclear waste management program has not been successful to date. Any workable solution for meeting our obligation to dispose of used fuel and high-level radioactive waste will need to be both technically sound and have the support of the affected state and communities. Our experience has shown that a site cannot be imposed without public acceptance. That

is why the BRC report and the Administration's *Strategy* focus on a consent-based siting process.

**Q11.** The Waste Isolation Pilot Project in New Mexico is often cited as a successful example of consent-based siting. Please provide a comprehensive list of all administrative actions, citizen suits, injunction requests or other legal challenges to the development or opening of the facility including those initiated by the State of New Mexico, environmental stakeholders, or other plaintiffs or petitioners. The list should a description of the action, the date the action was commenced, the date it was resolved or concluded, and the outcome.

**A11.** The Waste Isolation Pilot Plant (WIPP) represents the United States' only mined geologic repository for the permanent disposal of defense-generated transuranic waste. Below is a list of administrative actions, citizen suits, injunction requests, and other legal challenges that involved WIPP prior to its operation.

**Summary of Administrative and Legal Actions Involving WIPP Prior to Operation**

<b>DATE</b>	<b>TYPE OF ACTION</b>	<b>INITIATED BY</b>	<b>DISCUSSION</b>
1974	Administrative	Atomic Energy Commission	A location 30 miles east of Carlsbad is chosen.
1975	Administrative	Governor of New Mexico	New Mexico Governor Apodaca establishes a Governor's Advisory Committee on WIPP.
1976	Administrative	Energy Research and Development Administration	Energy Research and Development Administration (ERDA) files an application with the U.S. Interior Department's Bureau of Land Management (BLM) for the withdrawal of 17,200 acres of land in Eddy County for the WIPP Project. [Federal Register, Vol. 41, No. 243, p. 54994, December 16, 1976]
1978	Administrative	Department of Energy	On October 13, the U.S. Department of Energy (DOE) files an application with the BLM to continue the segregation of 17,200 acres of land in Eddy County, New Mexico, for the WIPP Project. [Federal Register, Vol. 43, No. 221, p. 53063, November 15, 1978]
1978	Administrative	Department of Energy	The Department of Energy funds the formation of the Environmental Evaluation Group (EEG) is established to provide a full-time, independent technical assessment of the WIPP Project. [Cooperative Agreement No. DE-AC04-79AL10752]
1979	Legislative	New Mexico Legislature	The New Mexico State Legislature establishes the interim legislative Radioactive and Hazardous Materials

DATE	TYPE OF ACTION	INITIATED BY	DISCUSSION
			Committee and the Radioactive Waste Consultation Task Force. [Laws of 1979, Chapter 380; Section 74-4A-2 New Mexico Statutes Annotated 1978]
1979	Regulatory	Department of Energy	The DOE issues its Draft Environmental Impact Statement (DEIS) on WIPP
1979	Legislative	New Mexico Legislature	The U.S. Congress approves the Department of Energy National Security and Military Applications of Nuclear Energy Authorization Act of 1980 (Public Law 96-164). Section 213(a) of the Act authorizes WIPP and mandates a written consultation and cooperation agreement with the State of New Mexico by September 30, 1980.
1980	Administrative	Department of Energy and State of New Mexico	Negotiations on a consultation and cooperation agreement are conducted.
1980	Regulatory	Department of Energy	The DOE issues its Final Environmental Impact Statement (FEIS) on WIPP. [U.S. Department of Energy, Final Environmental Impact Statement, Waste Isolation Pilot Plant, DOE/EIS-0026, October 1980]
1980	Administrative	Department of Energy	The DOE files an application with the BLM for the withdrawal of 8,960 acres of federal land for the purpose of conducting a Site and Preliminary Design Validation (SPDV) program at the WIPP. [Federal Register, Vol. 45, No. 196, p. 75768, November 17, 1980]
1981	Regulatory	Department of Energy	The DOE issues its Record of Decision to proceed with WIPP construction. [Federal Register, Vol. 46, No. 18, p. 9162, January 28, 1981]
1981	Legal	State of New Mexico	New Mexico Attorney General Bingaman files suit in U.S. District Court (Albuquerque) against the DOE and the Interior Department, alleging violations of federal and State law in connection with the continuing development of WIPP. [Civil Action No. 81-0363 JB]
1981	Legal	U. S. District Court	U.S. District Judge Juan G. Burciaga issues a federal court Order, which provides New Mexico a meaningful role in the decision-making process for the WIPP Project. The Order stays all proceedings in the State lawsuit in accordance with a Stipulated Agreement which requires the DOE perform additional geotechnical studies at the WIPP site and then provide the results to the State for review. It also requires DOE and the State to reach a negotiated settlement on certain State "off-site concerns" (e.g., emergency response, highway upgrading, transportation monitoring, and accident liability).
1981	Administrative	Department of Energy and State of New Mexico	The Consultation and Cooperation Agreement is signed by Governor Bruce King and DOE Secretary James Edwards.
1982	Administrative	Department of	The BLM issues Public Land Order 6232, withdrawing

DATE	TYPE OF ACTION	INITIATED BY	DISCUSSION
		Interior	8,960 acres of federal land (and 1,280 acres of State trust land, if acquired by the federal government) for the purpose of conducting the SPDV program at WIPP. [Federal Register, Vol. 47, No. 61, p. 13340, March 30, 1982]
1982	Administrative	Department of Energy and State of New Mexico	The DOE and New Mexico enter into the Supplemental Stipulated Agreement Resolving Certain State Off-site Concerns over WIPP.
1983	Administrative	Department of Energy	The DOE files an application with the BLM for the withdrawal of 8,960 of federal land (and 1,280 acres of State land, if acquired by the federal government) for the purpose of constructing WIPP. [Federal Register, Vol. 48, No. 19, p. 3878, January 27, 1983]
1983	Administrative	Department of Interior	The BLM issues Public Land Order 6403, withdrawing 8,960 acres of federal land (and 1,280 acres of State trust land, if acquired by the federal government) for the construction of full facilities at the WIPP site. [Federal Register, Vol. 48, No. 130, p. 31038, July 6, 1983]
1983	Administrative	Department of Energy	The DOE announces its decision to proceed with full facility construction of the WIPP. [Federal Register, Vol. 48, No. 128, p. 30427, July 1, 1983]
1984	Administrative	Department of Energy and State of New Mexico	New Mexico and the DOE execute the "First Modification to the 1981 Consultation and Cooperation Agreement."
1984	Regulatory	Environmental Protection Agency	In September, the U.S. Environmental Protection Agency (EPA) promulgates its "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes." [Federal Register, Vol. 50, No. 182, p. 38066, September 19, 1985]
1986	Regulatory	Environmental Protection Agency	In July, the EPA clarifies that the hazardous constituents of radioactive mixed wastes are subject to regulation under Subtitle C of the Resource Conservation and Recovery Act of 1976 (RCRA). [Federal Register, Vol. 51, No. 128, p. 24504, July 3, 1986]
1987	Administrative	Department of Energy	In early May, the DOE confirms and further clarifies EPA's July 3, 1986, interpretive notice, stating "...all DOE radioactive waste which is hazardous under RCRA will be subject to regulation under both RCRA and the AEA (Atomic Energy Act of 1954)." [Federal Register, Vol. 52, No. 84, p. 15937, May 1, 1987]
1987	Legal	U. S. Court of Appeals	The U.S. Court of Appeals for the First District (Boston) vacates and remands to the EPA for reconsideration Subpart B of its "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level, and Transuranic Radioactive Waste," 40 CFR Part 191.

DATE	TYPE OF ACTION	INITIATED BY	DISCUSSION
1987	Administrative	Department of Energy and State of New Mexico	New Mexico and the DOE execute the "Second Modification to the Consultation and Cooperation Agreement."
1987	Administrative	Department of Energy and State of New Mexico	A separate agreement, which amends the 1982 Supplemental Stipulated Agreement and relates to funding for WIPP by-passes and relief routes in New Mexico, is also executed by New Mexico and the DOE.
1988	Administrative	Department of Interior	The BLM issues to the State of New Mexico a land exchange conveyance document. The document conveys to New Mexico 2,519.43 acres of federal land in Eddy County (both surface and mineral estate) in exchange for 1,280 acres of State trust lands (both surface and mineral estate) located within the WIPP withdrawal area. [Federal Register, Vol. 53, No. 115, p. 22391, June 15, 1988]
1988	Administrative	Department of Energy and State of New Mexico	The DOE and New Mexico execute a Cooperative Agreement, No. DE-FC04-88AL53813, entitled "WIPP Enhancement of the State of New Mexico's Emergency Response Capability."
1988	Legislative	Congress	The National Defense Authorization Act for Fiscal Year 1989 (Public Law 100-456) was signed into law. Section 1433 of the Act assigns the Environmental Evaluation Group (EEG) to the New Mexico Institute of Mining and Technology and provides for continued funding from DOE through Cooperative Agreement No. DE-AC04-89AL58309.
1989	Administrative	Department of Energy	The DOE files an application with BLM for the withdrawal of 10,240 acres of federal land. The application is noticed in the Federal Register of April 19, 1989.
1989	Regulatory	Department of Energy	The DOE submits to the U.S. Environmental Protection Agency (EPA) a "No-Migration Variance Petition."
1989	Regulatory	Department of Energy	The DOE issues its Draft Supplement Environmental Impact Statement (DSEIS) on WIPP. [Federal Register, Vol. 54, No. 76, p. 16350, April 21, 1989]
1989	Regulatory	Nuclear Regulatory Commission	On August 29, the U.S. Nuclear Regulatory Commission (NRC) issues a "Certificate of Compliance" for the TRUPACT-II.
1990	Regulatory	Department of Energy	In late January, the DOE issues its Final Supplement Environmental Impact Statement (FSEIS) on WIPP. [U.S. Department of Energy, Final Supplement Environmental Impact Statement, Waste Isolation Pilot Plant, DOE/EIS-0026-FS, January 1990]
1990	Regulatory	Department of Energy	The DOE announces Secretary Watkins' approval of a "Record of Decision" (ROD) on the WIPP Final Supplement Environmental Impact Statement. [Federal Register, Vol. 55, No. 121, p. 25689, June 22, 1990]
1990	Regulatory	Environmental Protection	The New Mexico Environment Department (NMED) is authorized by EPA to regulate radioactive mixed wastes in

DATE	TYPE OF ACTION	INITIATED BY	DISCUSSION
		Agency	New Mexico in accordance with its approved program. [Federal Register, Vol. 55, No. 133, p. 28397, July 11, 1990]
1990	Regulatory	Environmental Protection Agency	The EPA issues a conditional no-migration determination for the WIPP facility. [Federal Register, p. 47700, November 14, 1990]
1991	Administrative	Department of Interior	The U.S. Interior Department issues Public Land Order No. 6826, which modifies an earlier WIPP administrative land withdrawal order (Public Land Order No. 6403) [Federal Register, Vol. 56, No. 18, p. 3038, January 28, 1991; and Vol. 56, No. 29, p. 5731, February 12, 1991]
1991	Administrative	New Mexico Highway Commission	The N.M. State Highway Commission designates new WIPP routes in New Mexico after a comprehensive comparative analysis of alternative routes and a series of public hearings.
1991	Administrative	Department of Energy	Secretary Watkins notifies U.S. Interior Secretary Manuel Lujan, Jr., that WIPP is ready to begin the Test Phase. Similarly, the State of New Mexico is notified that the first shipment of waste may reach the WIPP site by October 10. [Federal Register, Vol. 56, No. 196, p. 50923, October 9, 1991]
1991	Legal	New Mexico Attorney General	New Mexico Attorney General Tom Udall files a lawsuit in U.S. District Court for the District of Columbia against DOE and the U.S. Department of the Interior to stop the threatened shipment of wastes to WIPP under the administrative withdrawal. [Civil Action No. 91-2527]
1991	Legal	Environmental Groups	Four environmental groups file a lawsuit in U.S. District Court for the District of Columbia. [Civil Action No. 91-2929]
1991	Injunction	U.S. District Court	U.S. District Court Judge John Garrett Penn issues an Order, along with a corresponding explanatory memorandum, granting the State's motion for a preliminary injunction. [Civil Action 91-2527]
1992	Injunction	U.S. District Court	Judge Penn issues an Order that imposes a permanent injunction prohibiting the transport or disposal of any transuranic (TRU) waste at WIPP; it also grants two separate motions for summary judgment in the consolidated WIPP lawsuits.
1992	Legal	State of New Mexico	In the first of the consolidated suits, State of New Mexico v. Watkins (Civil Action No. 91-2527), Judge Penn granted the plaintiff-intervener's motion for summary judgment.
1992	Legal	Environmental Defense Fund	In Environmental Defense Fund v. Watkins (Civil Action No. 91-2929) Judge Penn granted EDF's motion for summary judgment
1992	Legal	Department of Energy	The DOE appeals Judge Penn's ruling of January 31, 1992.

DATE	TYPE OF ACTION	INITIATED BY	DISCUSSION
1992	Legal	Appeals Court	The U.S. Court of Appeals for the D.C. Circuit reversed the earlier ruling that WIPP was not eligible for interim status under RCRA and upheld the District Court's decision that Interior Secretary Lujan exceeded his authority under Federal Land Policy Management Act in approving WIPP Public Land Order 6826, issued January 22, 1991. [Civil Action Nos. 91-5387 and 92-5044]
1992	Legal	New Mexico Supreme Court	The New Mexico Supreme Court determined that the diminution in value of the remainder of landowners' property due to public fear from the use of part of it to construct bypass for transportation of nuclear waste, whether the fear was well-founded or not, was compensable in condemnation proceeding. [Santa Fe v. Komis, No. 20325, SUPREME COURT OF NEW MEXICO, 114 N.M. 659; 845 P.2d 753; 1992 N.M. LEXIS 246; 31 N.M. St. B. Bull. 945, August 26, 1992, Decided, August 26, 1992, Filed, As Corrected.]
1992	Legislative	U. S. Congress	The WIPP Land Withdrawal Act (Public Law 102-579) was signed into law.
1993	Regulatory	Environmental Protection Agency	The EPA issues a Final Rule that amends its regulations codified at 40 CFR Part 191. [Federal Register, Vol. 58, No. 242, p. 66398, December 20, 1993]
1995	Regulatory	Department of Energy	The DOE submits the Resource Conservation and Recovery Act (RCRA) Part B permit application [DOE/WIPP 91-005, Rev. 6] to the New Mexico Environment Department (NMED).
1996	Regulatory	Environmental Protection Agency	The EPA issues a Final Rule establishing criteria for use in certifying whether WIPP complies with the applicable disposal standards set forth in 40 CFR Part 191. [Federal Register, Vol. 61, No. 28, p. 5224, February 9, 1996]
1996	Legal	New Mexico Attorney General, Environmental Groups	The New Mexico Attorney General files a petition in the U.S. Court of Appeals for the D.C. Circuit for review of EPA's final WIPP Compliance Criteria, 40 CFR Part 194. [Civil Action No. 96-1107] This petition is ultimately consolidated with two other similar petitions filed by: two environmental groups and two individuals [Civil Action No. 96-1108]; and the Texas Attorney General [Civil Action No. 96-1109].
1996	Regulatory	Department of Energy	The DOE submits a final No-Migration Variance Petition to the EPA.
1996	Legislative	U. S. Congress	The National Defense Authorization Act for Fiscal Year 1997 (Public Law 104-201) was signed into law and amended the 1992 WIPP Land Withdrawal Act.
1997	Legal	U.S. Court of Appeals	The U.S. Court of Appeals for the D.C. Circuit denies petitions for review filed by the New Mexico Attorney General and others of EPA's final WIPP Compliance Criteria.

DATE	TYPE OF ACTION	INITIATED BY	DISCUSSION
1997	Regulatory	Department of Energy	The DOE issues its WIPP Disposal Phase Final Supplemental Environmental Impact Statement (DOE/EIS-0026-FS2, September 1997).
1998	Regulatory	Department of Energy	The DOE issues a "Record of Decision" (ROD) to dispose of TRU waste at WIPP. [Federal Register, Vol. 63, No. 15, p. 3624, January 23, 1998]
1998	Regulatory	Environmental Protection Agency	The EPA announces it is certifying that WIPP will comply with the applicable disposal regulations set forth at Subparts B and C of 40 CFR Part 191. [Federal Register, Vol. 63, No. 95, p. 27354, May 18, 1998] Immediately following the EPA announcement, DOE Secretary Federico Pena notifies Congress that WIPP is ready to begin disposal operations. Also on this same date, DOE petitions the U.S. District Court for the District of Columbia to lift its 1992 permanent injunction barring the transport or introduction of any TRU waste at WIPP. Subsequently, oral arguments in the case are scheduled for March 12, 1999.
1998	Administrative	Department of Energy	The DOE Secretary Federico Pena notifies Congress that WIPP is ready to begin disposal operations. Also on this same date, DOE petitions the U.S. District Court for the District of Columbia to lift its 1992 permanent injunction barring the transport or introduction of any TRU waste at WIPP. Subsequently, oral arguments in the case are scheduled for March 12, 1999.
1998	Legal	Department of Energy	The DOE petitions the U.S. District Court for the District of Columbia to lift its 1992 permanent injunction barring the transport or introduction of any TRU waste at WIPP.
1998	Legal	New Mexico Attorney General, Environmental Groups	On July 17, 1998, the New Mexico Attorney General and three environmental groups filed petitions against EPA and Administrator Browner in the U.S. Court of Appeals for the D.C. Circuit, alleging violations of notice and comment rulemaking and substantive technical errors in EPA's certification of WIPP. [Civil Action Nos. 98-1322, -1323, -1324]. Subsequently, on May 5, 1999, the Court granted New Mexico's motion for voluntary dismissal and cancelled oral arguments scheduled for the next day. The Court issued an order on June 28, 1999, denying the remaining petitioners' challenges.
1999	Legal	District Court	Judge Penn denies request for injunction and confirms WIPP Interim Status under RCRA.
1999	Operational	Department of Energy	First shipment arrives from Los Alamos National Laboratory
1999	Regulatory	New Mexico Environment Department	New Mexico issues Hazardous Waste Facility Permit
2000	Operational	Department of Energy	First mixed waste shipment arrives from Rocky flats



**Q12. Is DOE using taxpayer money to fund public opinion polling in any of these potential host states or communities? Are public preference studies different from public opinion polling? If so, please explain.**

**A12. DOE appropriated funds are used to understand technical issues related to public preference studies, which, as explained below, are different from public opinion polling.**

**The difference between public opinion polling and public preference studies is that the latter seeks to measure more than opinions. Public preference studies seek to understand what people know about the nuclear fuel cycle, what they are concerned about and why they have the preferences they do about nuclear facility siting.**

**Q13. How long will it take DOE to establish “generic” safety standards for a repository other than Yucca Mountain?**

**A13. Under the Nuclear Waste Policy Act, the Department of Energy is not responsible for establishing either generic or specific safety standards for repositories. Rather NRC is responsible for establishing safety standards for repositories and the Environmental Protection Agency (EPA) is responsible for establishing radiation protection standards for the general public that are implemented by the Nuclear Regulatory Commission. The President’s Fiscal Year 2014 Budget requests funds for EPA to begin the process of updating the existing regulations.**

**Q14. Please explain whether you believe that the science done by our national labs in support of the Yucca Mountain license application is sound. Is it possible that a viable safety case for the Yucca Mountain repository was made in the DOE license application? If not, please explain.**

**A14. In moving to withdraw its Yucca Mountain license application, the Department has not disavowed the technical content set forth in the application. To the contrary, the**

Department believes that the license application was complete and accurate in all material respects. Rather, as the Department has made clear, after many years of experience and significant expenditure of funds, Yucca Mountain has not proved a workable option. The Department believes that we can and must do better, and believes that the appropriate basis upon which to do so is a consent-based siting process, as described in the *Administration Strategy*.

**Q15. How long would it take to transfer 70,000 metric tons of spent nuclear fuel from a "larger" interim storage facility to a repository?**

**A15. The time it would take to transfer 70,000 metric tons of used nuclear fuel from an interim storage facility to a geologic repository would depend on a number of factors, including the rate that the repository would accept the fuel. DOE has previously considered acceptance rates of 3,000 metric tons per year. Additional factors would include the mode of transportation and the proximity of the storage facility to the repository.**

**Q16. Please describe why you believe DOE has the authority to use Nuclear Waste Fund money to fund 180c transportation activities for destinations other than Yucca Mountain.**

**A16. Section 180(c) of the NWPA requires that the Secretary provide technical assistance and funds to States and Indian Tribes for training of public safety officials through whose jurisdictions the Secretary plans to transport spent nuclear fuel or high-level radioactive waste under subtitle A or subtitle C of the NWPA. The Department is not providing Nuclear Waste Fund money to States and Tribes for technical assistance or training of public safety officials under 180(c). DOE's activities under 180(c) relate to developing the process and procedures by which technical assistance and funds would be provided to**

**States and Tribes under 180(c) when the Secretary develops plans for specific transportation activities under the NWP.**

**Q17. Given that DOE has resumed the study of granite formations, have you formally considered certain factors as listed in Section 161(d) of the Nuclear Waste Policy Act? Please provide a list of the states where granite formations are located that might be favorable for repository development and whether each state is impacted by the disqualifying factors listed in Section 161(d).**

**A17. Although DOE is doing research and development on generic granitic bodies, those studies have not progressed to the point of including the factors listed in Section 161(d) of the Nuclear Waste Policy Act. Consideration of those factors would occur in the future as part of any site-specific studies of granite formations.**

**As recently as 2008, in "Report to the President and the Congress by the Secretary Of Energy on the Need for a Second Repository", granitic bodies believed to be adequate or that could be adequate for investigation for siting a second repository were identified in 25 states (Minnesota, Michigan, New Hampshire, Massachusetts, Pennsylvania, New Jersey, Maryland, North Carolina, Georgia, Wisconsin, Maine, Vermont, Connecticut, New York, Delaware, Virginia, South Carolina, Washington, Idaho, Arizona, Wyoming, Texas, Alabama, South Dakota, and Oklahoma).**

**Q18. Do you believe deep borehole disposal conforms to the NWP's retrievability requirement? Please provide a list of states that have geologic formations that might be favorable for the development of boreholes.**

**A18. Retrievability is likely more complex from deep boreholes than from a mined repository. However, retrievability from deep boreholes is believed to be possible and worthy of further study. Using as a range of depth to crystalline basement of 0 to 2000 meters, every state is potentially suitable for borehole disposal. However, more research and**

study is needed on technical considerations, impacts, economics, and other issues related to deep borehole disposal to better understand the viability of this potential option.

**Q19.** During the hearing you testified that the Administration strongly supports the BRC recommendations. Please explain why the Administration hasn't proposed legislation to implement the recommendations.

**A19.** The Administration looks forward to working with Congress to develop the legislation necessary to move the country forward on this issue. In its *Strategy*, the Administration has highlighted agreement with many of the principles of the BRC recommendations and has outlined actions that, with legislative authorization by Congress, can lead to a safe and responsible solution to managing the nation's nuclear waste. Action by Congress is necessary for success of the waste management mission.

**Q20.** Section 302(a)(5)(B) of the NWPB states: "in return for payment of fees established in this section, the Secretary, beginning not later than January 31, 1998, will dispose of the high-level radioactive waste or spent nuclear fuel..."

Section 302(a)(6) continues: "The Secretary shall establish in writing criteria setting forth the terms and conditions under which disposal services shall be made available."

During the hearing you stated that: "Again, the one mil per kilowatt hour is not buy a facility. It's to buy a service. The service as far as the utility is concerned is spent fuel removal."

**a.** While a utility's primary concern may be spent fuel removal, please explain how your redefinition of the serve as spent fuel removal, rather than disposal:

- i.** Complies with the NWPB; and
- ii.** Meets your responsibility as Secretary to protect public health and safety by developing a repository for the permanent disposal of spent nuclear fuel and high-level waste.

**A20a.** The Secretary's responsibility to protect health and safety will be a central consideration as it moves forward with planning and implementing nuclear waste

disposal. The Secretary's statement at the July 31, 2013, hearing did not redefine or somehow limit the Department's responsibility under the NWPA to dispose of contract holders' spent nuclear fuel and high-level waste. In Indiana Michigan v. DOE, the D.C. Circuit explained that the Department is obligated to dispose of spent nuclear fuel, and that obligation is not tied to the commencement of repository operations. The Secretary remains committed to fulfilling that obligation, and his use of the term "remove" was intended to reaffirm this obligation.

Further, the Secretary recognizes that the NWPA obligates the Department to enter into Standard Contracts with all entities that "generate[] or hold[] title to high-level radioactive waste, or spent nuclear fuel, of domestic origin for the acceptance of title, subsequent transportation, and disposal of such waste or spent fuel . . . ." The Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Waste sets out the terms and conditions for which those disposal services will be made available to contract holders. For example, Article IV.B.1. of the Standard Contract provides that "DOE shall accept title to all SNF and/or HLW of domestic origin, generated by the civilian nuclear power reactor(s)[,] . . . provide subsequent transportation for such material to the DOE facility, and dispose of such material in accordance with the terms of this contract." Moreover, the Department remains committed to its obligation to accept, manage, and ultimately dispose of spent nuclear fuel and high-level radioactive waste.

- b. Given how this redefinition of the service as spent fuel removal de-emphasizes permanent disposal, please describe why such a redefinition will not further increase

communities concerns that any interim storage site will become a de facto permanent repository.

A20b. As explained above, the Secretary has not redefined the Department's obligation to dispose of high-level radioactive waste and spent nuclear fuel. Nor has this obligation been deemphasized. As outlined in the Administration's *Strategy*, siting and licensing a permanent geologic repository, using a consent-based siting approach, is a key component of the Department's strategic plan.

Pursuing permanent disposal will also ensure that any interim storage options do not become de facto permanent repositories. Interim storage will allow the Department to achieve important goals such as meeting its obligation to remove contract holders' high-level waste and spent nuclear fuel from shutdown reactors.

- c. Will the removal of spent nuclear fuel from an NRC-licensed site to a separate NRC-licensed site provide any increase in the safety or security of the stored spent fuel? If so, please explain.

A20c. Any NRC-licensed site will be safe and secure for storage of spent fuel.

However, there may be other reasons why moving spent fuel in storage at one or more NRC-licensed site(s) to another NRC-licensed site would be advantageous, including, for example, cost and land use considerations.

**The Honorable Gus M. Bilirakis**

- Q1. Mr. Secretary in your testimony you mentioned the considerable cost of the federal government paying utilities for breaching its contract to dispose of used nuclear fuel. The failure of the federal government to fulfill its legal obligations has resulted in dozens of lawsuits and \$2 billion in payments to utilities so far, with the prospect of tens of billions of dollars of payments in the future. In addition, the Department of Justice has spent more than \$188 million through 2011 to litigate these cases. Considering how scarce taxpayer dollars are now, why doesn't the Department enter into fair and reasonable settlements with the utilities to minimize the ongoing costs of litigation?**
- A1. The Attorney General has the authority to resolve disputes in Federal Court. 28 U.S.C. sec. 516. Thus far the Department of Justice has obtained settlements covering approximately 70 percent of the nation's nuclear reactors. We respectfully suggest that any further inquiries regarding the litigation or its potential resolution should be directed to the Department of Justice.**

**The Honorable John D. Dingell**

- Q1. In 2006, you wrote an article expressing support for Yucca Mountain but in 2011 wrote another article saying that there needs to be an alternative to Yucca Mountain. Do you now believe that Yucca Mountain is no longer an option as a permanent repository? Please provide additional information for the record regarding the viability of Yucca Mountain as a permanent repository.**
- A1. This Administration has consistently said that Yucca Mountain is not a workable option. Any workable lasting solution for the final disposition of used fuel and nuclear waste must be based not only on sound science but also on achieving public support in the affected communities and states. When this Administration took office, the timeline for opening Yucca Mountain had already been pushed back by two decades, stalled by public protest and legal opposition. It was clear that the stalemate could continue indefinitely.**
- Q2. Among the BRC's recommendations is a consent based approach where localities across the country could volunteer to be the site of a new repository. Under the best case scenario, where all units of government, from local to state to federal, agree and there is a site that meets the needs for a repository of this kind, approximately how long and how much do you believe it would cost to go through this process?**
- A2. The Administration's *Strategy* is to have a repository sited through a consent based approach, designed, licensed, constructed and operational by 2048. The Department's 2013 fee adequacy assessment estimated that the cost of pre-selection site evaluation for a repository could be approximately \$3.2 billion and that site characterization and licensing could be approximately \$8.5 billion.**
- Q3. The BRC report recommends "access to the funds nuclear utility ratepayers are providing for the purpose of nuclear waste management" and you propose non-legislative as well as legislative changes to achieve this goal. Can access to the funds be gained through non-legislative means?**



- A3. Reclassifying nuclear waste fees is not a simple technical correction, and achieving a sustainable funding scheme for the nation's nuclear waste management is best accomplished through legislation. Administrative reclassification is unworkable and would not provide the stable funding situation that all parties are seeking to address this problem.**
- Q4. In the 2011 article I referenced earlier, you noted that you are strong supporter of nuclear energy, developing new nuclear technologies, and investing in other energy technologies. Based on recent appropriations and the recently passed Energy and Water Appropriations from the House, do you believe your Department has the resources to invest in these technologies to prevent, as you put it, America being "less competitive in the global technology market?" Would you please provide information for the record on how you intend to keep our country competitive?**
- A4. Competing in the new energy economy will require us to harness the expertise of our scientists, engineers, and entrepreneurs. As the President said, the "the world is shifting to an innovation economy, and nobody does innovation better than America. In today's innovation economy, we need a world-class commitment to science and research." The President is committed to making investments in research and development (R&D) that will grow our economy and enable America to remain competitive. This focus on science and innovation will help create the industries and jobs of the future and address the challenges and opportunities of the 21st Century.**

**With regard to nuclear power, the President's FY 2014 budget request invests \$735 million in the nuclear energy program to help develop the next-generation of nuclear power technologies, including small modular reactors and improved light water reactor systems, and to continue R&D efforts in areas such as improved fuel forms.**

**The Administration recognizes the Government's role in fostering scientific and technological breakthroughs, and has committed significant resources to ensure America leads the world in the innovations of the future. This includes \$5.2 billion for the Office of Science to support basic research that could lead to new discoveries and help solve our energy challenges. These funds support progress in materials science, basic energy science, advanced computing and more. They also provide America's researchers and industries with state-of-the-art tools to ensure they stay at the cutting edge of science.**

**The FY 2014 budget request continues to support Energy Frontier Research Centers. The Energy Frontier Research Centers are working to solve specific scientific problems to help unleash new clean energy technology development. So far, the EFRCs have generated some 3,400 peer-reviewed papers, 60 invention disclosures, and 200 patents. In addition, the Centers report numerous instances of technology transfer. In their three-plus years of existence, the EFRCs have achieved scientific breakthroughs in multiple areas, from solar power and batteries to new catalysts for refining petroleum and powering fuel cells. In FY 2014, we are going to hold an open re-competition to select new EFRCs and consider renewal applications for existing EFRCs.**

**The FY 2014 budget request also supports the five existing Energy Innovation Hubs and proposes a new Hub in electricity systems. Through the Hubs, we are bringing together our nation's top scientists and engineers to achieve game-changing energy goals. The Hubs continue to make progress. For example, the Modeling and Simulation for Nuclear**

**Reactors Hub has released the first versions of software that, support simulating a virtual model of an operating physical reactor. The Fuels from Sunlight Hub has filed multiple invention disclosures and published scientific papers. And the Energy Efficient Buildings Hub is developing advanced building modeling tools and has built one of the country's first 3-D building design labs.**

**Additionally, the FY 2014 budget request includes \$379 million for the Advanced Research Projects Agency for Energy, known as ARPA-E, to support high-impact energy technology projects with the potential to transform the energy sector. ARPA-E has invested in roughly 285 high-risk, high-reward research projects that, if successful, could create the foundation for entirely new industries. Seventeen of these projects, which received an initial investment from ARPA-E of approximately \$70 million in total, have attracted over \$450 million in private sector follow-on funding. These companies and research teams have produced a battery that doubled the energy density of any previous design, successfully engineered microbes that use carbon dioxide and hydrogen to make fuel for cars, and developed a 1 megawatt silicon carbide transistor the size of a fingernail.**

**In FY14, ARPA-E will continue to work on a variety of transportation projects, including alternative and bio-derived fuels, batteries, components for transportation electrification, and advanced vehicle designs and materials. Additionally, ARPA-E will continue work on stationary power systems, including building efficiency, stationary energy storage systems, grid modernization, and stationary energy generation.**

**Taken together, our research initiatives will help power America's great innovation machine to accelerate energy breakthroughs and create jobs.**



**Department of Energy**  
Washington, DC 20585

March 31, 2014

The Honorable Mary L. Landrieu  
Chairman  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Madam Chairman:

On January 28, 2014, Dr. David Danielson, Assistant Secretary for the Office of Energy Efficiency and Renewable Energy, testified regarding S. 1600, the Critical Minerals Policy Act of 2013.

Enclosed are the answers to seven questions submitted by Ranking Member Lisa Murkowski, and Senator Al Franken to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis", is positioned above the printed name.

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Lisa Murkowski, Ranking Member



## QUESTION FROM RANKING MEMBER MURKOWSKI

**Q1. Many of us look to the Department of Energy to be an advocate for our energy supply within the councils of our government. There's a corollary concern present here, however: because so many new energy technologies rely so heavy on critical minerals, we also need your Department to be an advocate for our domestic mineral supply. Can you make that commitment to us? In the interagency process, are you willing to highlight the importance of, and push for actions that would facilitate, a steady, affordable, and domestic supply of minerals?**

**A1. The Department is committed to ensuring a sustainable domestic supply chain for the clean energy economy, including the foundational materials supporting clean energy technologies.**

**The Department's *Critical Materials Strategy* reports make clear that diversified global supply chains are essential for a sustainable clean energy economy.**

**The Critical Materials Institute (CMI) at Ames National Laboratory is a lead contributor to the Department's research and development on critical materials issues. CMI addresses materials criticality problems by developing technologies spanning the supply chain and across the lifecycle of materials.**

**DOE takes an active role in interagency coordination, collaboration, and planning in the critical materials space to help the U.S. government make better strategic decisions, and will continue interagency leadership as co-chair of the National Science and Technology Council Subcommittee on Critical and Strategic Mineral Supply Chains. This Subcommittee facilitates a strong, coordinated effort across federal agencies to identify and address important policy implications arising from strategic minerals supply issues. Areas of focus for the Subcommittee include identifying emerging critical materials, improving depth of information, and identifying R&D priorities. The Subcommittee also informally reviews and**

**examines domestic and global policies that affect the supply of critical materials, such as permitting, export restrictions, recycling, and stockpiling.**

## QUESTION FROM RANKING MEMBER MURKOWSKI

- Q2.** Is the Department working on any follow-up reports to supplement its 2010 and 2011 Critical Mineral Strategy documents? If so, please describe the expected timing of their release and the expected scope of their content.
- A2.** By the end of 2014, the Department of Energy plans to assess whether an update to the 2011 Critical Materials Strategy is needed, given the related research and development and coordination work underway.

In addition to the Critical Materials Strategy reports, the Department of the Interior, through the USGS Mineral Resources Program, provides annual collection, analysis, and the dissemination of data that document production and consumption for about 100 mineral commodities, both domestically and internationally for 180 countries (<http://minerals.usgs.gov/minerals>). This full spectrum of mineral resource science allows for a comprehensive understanding of the complete life cycle of nonfuel mineral resources – resource formation, discovery, production, consumption, use, recycling and reuse.



## QUESTION FROM RANKING MEMBER MURKOWSKI

- Q3. The Department has allocated hundreds of millions of taxpayer dollars to develop high-density energy storage devices that utilize lithium metal. Yet global demand for lithium is rising, particularly in China, and the United States is already heavily dependent on imports. Has the Department analyzed any potential supply chain impacts that we could face with regard to lithium? Could we see a situation similar to what has happened with rare earth elements? How could that impact our ability to commercialize new technologies that rely upon this metal?
- A3. In 2010 and 2011, the Department released *Critical Materials Strategy* reports which, in addition to identifying critical materials, identified lithium as a “near critical” material. The reports identified lithium because of its important role in batteries for hybrid and electric vehicles. While lithium does not face the same magnitude of risk to supply chain disruption as rare earth elements, the Department is still applying the three pillars of the *Critical Materials Strategy* to lithium research and development.

The Department is currently addressing this issue by reducing criticality risks for lithium. Because of the projected importance of lithium supply for clean energy applications, the Department will continue R&D in this important area to mitigate potential supply chain constraints. For example, within the Office of Energy Efficiency and Renewable Energy the Geothermal Technologies Office has funded the development of technologies to cost effectively extract minerals such as lithium, manganese and zinc from geothermal brines – to improve domestic production at reduced costs and to increase the overall value of geothermal electricity generation. The Vehicle Technologies Office has supported a project to expand lithium carbonate and lithium hydroxide production to supply the domestic battery industry as well as a project to recycle lithium batteries for resale of lithium carbonate.

## QUESTION FROM RANKING MEMBER MURKOWSKI

- Q4.** Given the range of new technologies that are expected to account for larger and larger shares of lithium consumption, does the Department believe we could face constraints or even a shortage in the supply of lithium available for more traditional applications such as batteries? Has the Department done anything to help mitigate such a scenario? What steps, if any, does the Department believe are warranted to prevent that from happening?
- A4.** As mentioned above, the Department is addressing potential supply constraints with regard to lithium. Currently, the Department's research efforts focus on diversifying supply, developing substitutes, and driving recycling of lithium. Because there are significant additional low cost potential sources of lithium from desert brines, lithium has a lower risk of supply disruption than certain rare earth elements, even under high global electric vehicle deployment scenarios. However, because dramatic increase in global lithium battery production could lead to a supply-demand mismatch in the next five years, the Department is applying the three pillars of the *Critical Materials Strategy* to lithium research and development.

The Critical Materials Institute at Ames National Laboratory conducts research and development (R&D) addressing supply diversity, substitutes, and recycling for lithium. Other national laboratories also contribute to lithium R&D. For example, the Joint Center for Energy Storage Research (JCESR), the Energy Innovation Hub for Battery and Energy Storage, is addressing lithium substitutes. Launched in December 2012, JCESR is managed by the Department's Office of Science and is led by Argonne National Laboratory. The mission of JCESR is to develop new battery chemistries beyond lithium-ion and to deliver electrical energy storage with five times the energy density and one-fifth the cost of today's commercial batteries within five years.

**Within the Office of Energy Efficiency and Renewable Energy, the Vehicles Technology Office has supported a project to expand lithium carbonate and lithium hydroxide production to supply the domestic battery industry, and the Geothermal Technologies Office has funded the development of technologies to cost effectively extract minerals such as lithium from geothermal brines to improve domestic production at reduced costs and to increase the overall value of geothermal electricity generation.**

**Finally, the Department's Advanced Research Projects Agency - Energy also supports R&D on a broad array of novel battery technologies that do not use the lithium-ion platform.**

## QUESTION FROM SENATOR FRANKEN

**Q1. Rare earths are critical to the high-tech sector and the energy sector. But in many cases, we are dependent on imports from China. In recent years, we've seen large price increases for these rare earth elements, and we need to make sure that our dependency doesn't harm our manufacturing sector. This is one of the reasons why I am a cosponsor of S. 1600, the Critical Minerals Policy Act of 2013. Can you talk about which particular clean energy technologies are most dependent on rare earth elements?**

**A1. The Department's 2010 and 2011 *Critical Materials Strategy* reports identified five rare earth materials – neodymium, europium, terbium, dysprosium, and yttrium – as critical materials currently essential for America's transition to cost-competitive clean energy technologies and subject to supply risk. Neodymium and dysprosium are used for magnets, which are found in electric vehicle motors and wind turbine generators. Europium, terbium, and yttrium are used in phosphors for efficient lighting. In addition, another rare earth element, lanthanum, is used in nickel metal hydride batteries. However, as lanthanum is relatively abundant, DOE did not identify it as critical in its *Critical Materials Strategy* reports.**

## QUESTION FROM SENATOR FRANKEN

**Q2. How does our dependence on China impact these sectors of the clean energy economy?**

**A2. While China has been and continues to be a dominant source for critical materials, the on-going challenge is developing a secure domestic supply chain or substitutes for these critical materials so that as clean energy technologies are developed and deployed in the United States they can also be manufactured in the United States. The vulnerability associated with global dependence on critical materials underscores the importance of the Department's research and development activities in this area. The Department's *Critical Materials Strategy* and coordinated R&D efforts address supply chain disruption risks by diversifying supply, developing substitutes, and driving recycling of critical materials.**

### **QUESTION FROM SENATOR FRANKEN**

**Q3. What have been the major barriers that have prevented us from mining, separating, and refining rare earth elements for use here in the United States?**

**A3. One of the primary barriers to upstream domestic critical materials development has been the high capital requirements associated with overcoming the technical challenges at this stage in the supply chain. This barrier to entry has led to a natural monopoly of processing operations concentrated in certain countries.**

**The Department addresses processing innovations through research and development (R&D) to help reduce processing capital requirements. For example, the Critical Materials Institute is considering new, lower cost ways to extract, separate, and process rare earth metals from ores and recycled materials, such as neodymium for permanent magnets and europium for lighting.**



**Department of Energy**  
Washington, DC 20585

March 31, 2014

The Honorable Cynthia Lummis  
Chairman  
Subcommittee on Energy  
Committee on Science, Space, and Technology  
U. S. House of Representatives  
Washington, DC 20515

Dear Madam Chairman:

On October 30, 2013, Dr. Patricia Dehmer, Acting Director of the Office of Science, testified regarding the Tools for Scientific Discovery and Basic Energy Research: The Department of Energy Science Mission.

Enclosed are the answers to 11 questions that were submitted by Representative Joseph Kennedy, and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher E. Davis".

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Eric Swalwell, Ranking Member



## **QUESTIONS FROM REPRESENTATIVE CYNTHIA LUMMIS**

**Q1. What opportunities exist to have DOE—and specifically its site offices—reduce day-to-day micromanagement of lab operations?**

**a. How can the Department balance the need for strong oversight and protection of taxpayer funding with providing additional flexibility to the National Labs?**

**A1. The Office of Science (SC) site model relies on an approach placing accountability on the M&O contractor for proper conduct of work, while providing federal oversight to ensure the contractor is operating safely and within requirements. This structure allows maximum flexibility for the Lab in executing DOE's mission while ensuring that federal funds are properly utilized consistent with Federal statutes and DOE requirements. SC also employs a robust oversight system to ensure that SC National Laboratories are operated in a manner to maximize proper operations, especially in safety and security.**

**Q2. Please summarize Secretary Moniz's vision for the National Lab complex. Specifically, how does the proposed creation of the National Laboratory Policy Council and the National Laboratory Operations Board fit into that vision?**

**a. How will these new entities, which have different lines of reporting, be coordinated with the Office of Science and the Under Secretary for Science and Energy?**

**A2a. The National Laboratory Policy Council (Council) and the National Laboratory Operations Board (Board) were established by the Secretary to contribute to an enterprise-wide effort to identify, manage, and resolve issues affecting the strategic guidance, management, operations, and administration of the National Laboratories.**

**The Council, chaired by the Secretary, provides a forum for the National Laboratories to provide strategic advice and assistance to the Secretary in the Department's policy and program planning processes and for the Department to provide strategic guidance**



on National Laboratory activities in support of Departmental missions. The Council's membership includes Directors of the National Laboratories, the Department's Under Secretaries (including the Under Secretary for Science and Energy), and Program office Assistant Secretaries (including the Director of the Office of Science).

The objectives of the Board are to strengthen and enhance the partnership between the Department and National Laboratories, and to improve management and performance to more effectively and efficiently execute the missions of the Department and the National Laboratories. The Board is chaired by the Under Secretary for Management and Performance and its membership includes the Deputy Under Secretary for Science and Energy, Program office Chief Operating Officers (including the COO for the Office of Science), and representatives from the National Laboratories' Chief Operating Officers and Chief Research Officers.

Both the Council and the Board will enable consistent and well-considered policy decisions affecting the Department's Laboratory complex. These efforts are designed to strengthen the relationship and interactions between the Department and the National Laboratories in ways that work toward eliminating stovepipes and streamlining operations to better achieve DOE's mission, maximize the impact of federal investment in the laboratories, and to better respond to opportunities and challenges.

Publication of consistent Departmental guidance across all Program offices will serve to increase the Department's ability to best match capabilities and resources present in the National Laboratories. The Council and Board provide a mechanism to give the Secretary and Senior Leaders consistent recommendations with widespread input from

all major DOE programs and the National Laboratories. The mixture of contractor and federal membership ensures that diverse viewpoints are represented and coordinated in recommendations made to the Secretary and Senior Leaders in support of DOE's mission.

- Q3. Section 109 of the draft legislation directs the Secretary of Energy to coordinate with other Federal agencies to reduce external regulation of National Lab nuclear safety and occupational and health responsibilities. Does the Department support the orderly transition of regulation to other Federal agencies?**
- a. Has the Department considered this transition previously?**
  - b. How can this transition from DOE regulation to other Federal agency regulation be conducted in an orderly and effective manner?**
  - c. Will the Department commit to working with the affected stakeholders to address this issue?**
- A3. The Department studied approaches for external regulation in the 1990's and 2000's, and in consultation with both the NRC and OSHA, ultimately found that it would be costly and time consuming, without any significant safety improvement. The Department, NRC, and OSHA found no compelling safety or financial justification for change. All prior reviews were performed before the Department streamlined its internal safety management directives that are applied through contracts. The Department of Energy therefore does not support a transition of safety regulation of its national laboratories to other Federal agencies. In conformance with prior congressional direction and the provisions of the Atomic Energy Act, the Department has established an effective and efficient approach to regulating nuclear safety and occupational safety and health of its national laboratories and other management and operations contractors that is suitable to its highly diverse operations and its unique safety hazards. The Department of Energy has been, and remains, fully committed to**

working with affected stakeholders to improve the management of nuclear safety and occupational safety and health at our national laboratories.

- Q4.** Currently, the Department must approve all technology transfer agreements between National Labs and non-federal entities, including Cooperative Research and Development Agreements (CRADAs) and non-Federal Work for Others Agreements. In 2011, the National Lab Directors Council sent a list of burdensome policies and practices to former Secretary Chu, and this approval process was the number one item on the list.
- a.** What is the Department's position on delegating signature authority for some technology transfer activities to the National Labs? What concerns does DOE have that may prevent this recommendation from being fulfilled?
  - b.** The EINSTEIN America discussion draft delegates signature authority on agreements under \$500,000. Is there a threshold which may provide for added flexibility to the National Labs, while preserving the Department's oversight responsibilities for larger projects?
- A4.** The Department has several concerns with the recommendation to delegate signature authority to the National Labs including Federal contracting statutory requirements and the need for Federal fiduciary oversight of these facilities. The primary role of the DOE Laboratories is to perform mission work for DOE. To that end, DOE must ensure that Laboratory personnel and resources are available to perform the DOE mission work before they are committed to perform work for outside sponsors. Such prioritization of resources requires DOE's pre-approval of work. Delegation to Laboratory Directors would result in the commitment of Government resources without prior Federal review of the specific agreements. Moreover, any funding/work commitments through these agreements require modification of the laboratory contract. The suggested delegation of authority would allow unilateral laboratory contract modification by the contractor, thereby abrogating the Federal government's fiduciary

responsibility. This approach is clearly contrary to established principles of functions and best practices that have been accepted across Federal agencies as inherently governmental, as codified in the Federal Acquisition Regulations (FAR), 48 C.F.R. Subpart 7.5.

Other concerns related to this type of delegation are when the laboratories engage foreign sponsors under these technology transfer arrangements and there is no DOE review of the activities. The arrangements with foreign entities must involve careful consideration of intellectual property (IP) rights disposition, national security concerns, and export control issues. This delegation of authority would remove the Department from the review process thereby rendering it unable to evaluate the IP ownership disposition and potential national security concerns before the laboratory makes contractual commitments with a foreign sponsor.

In addition, there are specific concerns for new Agreements for Commercializing Technology (ACT) transactions, which involve the laboratory contractors acting in a private capacity in the transaction, resulting in a heightened potential for conflicts of interest (COI) to arise. A primary reason for having DOE review all ACT projects prior to work starting under the pilot program is to ensure that the heightened potential for COI is mitigated. To delegate authority for signature (presumably without DOE pre-review) to the laboratories necessarily delegates COI review to the very party that may be conflicted. This is contrary to established COI principles and practices. Similarly, COI can also arise with other technology transfer agreements (work for others and cooperative research and development agreements, or CRADAs), and the same concern also arises for those agreements under this type of delegation.

Finally, such a delegation as it applies to CRADAs would need to be clarified in view of the Stevenson-Wydler Act, at 15 U.S.C. § 3710a (a), which permits the laboratory directors to enter into CRADAs only with an agency-approved joint work statement (JWS) or agency-approved annual strategic plan.

The Department continues to work with the National Labs to streamline the Federal approval process. For example, DOE has recently reduced the requirement for advance payment from 90 days to 60 days, which will lessen the financial burden on the non-Federal sponsors when working with the laboratories. DOE has also recently revised the CRADA Order and included a Short Form CRADA option as a means for simplifying and streamlining the process for projects that meet certain criteria and that do not exceed \$500,000. DOE has also recently implemented the “Fast Track” CRADA process for CRADAs valued at less than \$3 million, in which expedited site office approval is based on submission of a much abbreviated approval package for proposed CRADAs having work that falls within a DOE-approved annual strategic plan.

**Q5. Please provide your evaluation of the initial round of Energy Frontier Research Centers (EFRCs). What opportunities do you see to improve the overall effectiveness of EFRCs?**

- a. Please describe the Department’s plans to evaluate and reaward the second round of EFRCs. Are there organizations that will no longer receive DOE funding?**
- b. How do EFRCs fit within DOE’s Science and Technology programs?**

**A5. As a group, the 46 EFRCs, initiated in August 2009, have generally been regarded as highly successful. These multi-investigator, multi-disciplinary centers have world-class teams of researchers, often from multiple institutions, bringing together leading**

scientists to tackle some of the toughest scientific challenges hampering advances in energy technologies. In 2012 DOE conducted a midterm scientific peer-review of all 46 EFRCs. External reviewers found that the EFRCs: had high productivity; enabled high-risk, high-reward research that would not have otherwise been attempted; brought together synergistic, cross-disciplinary teams that challenge their members to ask difficult questions leading to potentially transformational results; accelerated the rate of both success and failure, from which lessons were rapidly learned and adjustments made; seamlessly integrated synthesis, characterization, theory, and computation to enhance both the quality and quantity of scientific progress; developed outstanding new experimental and theoretical tools, many of which are now available to the entire research community; and, trained next generation energy scientists by involving high quality students and postdoctoral researchers in this cutting-edge research. The details of these accomplishments are contained in the EFRC Report to Congress delivered in January 2013 and are quantified in the following paragraph .

As of August 2013, the EFRCs produced more than 4,000 peer-reviewed journal publications, approximately 200 U.S. and 130 foreign patent applications, and about 90 invention disclosures and 50 licenses. Currently, approximately 850 senior investigators and 2,000 staff and students are involved in the EFRCs. More than a thousand former students and staff have moved on to positions at graduate school or postdoctoral research (400), university faculty and staff (215), industrial research (340), or national laboratories, government agencies, and non-profit organizations (130). Nearly 60 companies have benefited from EFRC research. EFRCs are also making connections across the U.S. energy research enterprise. Each EFRC receives technical

advice from a scientific advisory board composed of scientific and technology leaders in their research area. Among the more than 260 scientific advisory board members across all of the EFRCs, more than 40 companies are represented.

Active stewardship of the EFRCs by the Office of Basic Energy Sciences (BES) has been a hallmark of the program. A variety of mechanisms have been used to assess regularly the ongoing progress of the EFRCs, including annual progress reports, monthly phone calls with the EFRC Directors, periodic Directors' meetings, and on-site visits by program managers. BES has also conducted two in-person reviews by outside experts and has held two Principal Investigators' meetings, bringing together staff, students, and postdoctoral researchers from across the EFRCs to exchange technical results and foster collaboration. BES continually assesses means to strengthen the program and to improve the effectiveness and impact of the EFRCs. Some mechanisms for improvement include the following:

- Strengthen the connections between EFRCs and BES user facilities. Some of the EFRCs have taken full advantage of BES facilities such as light sources, neutron sources, and nanoscience centers. BES fosters these connections by bringing EFRC researchers together with staff and management from the facilities. Such interactions could take place at the periodic EFRC Directors' Meetings, or at separately planned events.
- Further promote interactions and collaboration among EFRCs working in similar areas. This can be done in a variety of ways, including ad-hoc gatherings organized by BES at national scientific meetings, topical Principal

**Investigators' Meetings for subsets of the EFRCs, and maintaining a centralized repository for EFRC results and capabilities (especially newly-developed) that is available to all EFRCs.**

- **Continue to support a balanced portfolio of highly successful EFRCs. A major strength of the EFRCs is the breadth and depth of the program that paves the broad knowledge foundation for energy innovations. The FY 2014 competition will maintain a balanced EFRC portfolio of basic research with potential impact that spans energy production, storage, and use.**

**A5a. On September 30, 2013 DOE issued a Funding Opportunity Announcement (FOA) for the recompetition of the EFRCs. Both renewal proposals from the existing EFRCs and proposals for new EFRCs were encouraged. Mandatory Letters of Intent were due on November 13, 2013, and the full application due date is January 9, 2014. As with all FOAs, DOE intends to evaluate the eligible applications through a rigorous merit review involving external peer reviewers. Award announcements are expected in June 2014, with award selection based on the outcome of the merit review, program policy factors (as defined in the FOA), and the availability of appropriated funds for the EFRC program.**

**Of the current 46 EFRCs, 16 were fully funded by the 2009 Recovery Act. The FY 2014 request for EFRCs will likely support approximately 35 EFRCs and the projected awards will be in the \$2 million to \$4 million range per award per year for 5 years. While the exact makeup of FY 2014 EFRC awards and their affiliated organizations will be determined by the review process outlined above, it is likely that**



it will be a mixture of renewal awards for existing centers and new awards for the formation of new EFRCs. All awardees will have demonstrated a great probability of producing high-impact discoveries relevant to energy technologies.

**A5b. The Energy Frontier Research Centers (EFRCs), the Advanced Research Projects Agency-Energy (ARPA-E), and the Energy Innovation Hubs, together with the core research activities in the Office of Science and the technology offices, comprise a portfolio of energy R&D modalities that aim to maximize the Nation's ability to accelerate the pace of scientific innovations and energy breakthroughs. While each funding modality has its unique characteristics, DOE has significant internal coordination efforts to maintain their complementarity and provide solid communication of the advances among different offices within the Department. These coordination activities include regular meetings of the program staff, joint planning and reviews of funding opportunity announcements, and joint meetings with the researchers to ensure communication of the latest research advances and technological challenges.**

**The following are synopses of the unique characteristics and roles of the EFRCs, ARPA-E, and the Energy Innovation Hubs and how they complement each other:**

- 1. Energy Frontier Research Centers advance fundamental science relevant to real-world energy systems. Each focuses on the long term basic research needed to overcome roadblocks to revolutionary energy technologies in a particular area. They are mostly multi-institutional centers composed of a self-assembled group of investigators, often spanning several science and engineering disciplines. This research is both "grand challenge" and "use inspired" basic science**

motivated by the need to solve a specific problem, such as energy storage, photoconversion, etc. The choice of topics is at the discretion of the applicants in response to an FOA solicited broadly across grand challenge and use inspired science. The funding range is \$2 million to \$4 million per year per project.

2. ARPA-E supports energy technology research that is of potentially very high commercial and societal impact but is unlikely to attract private sector investment as a result of high technical and financial risk. ARPA-E follows the Defense Advanced Research Projects Agency's (DARPA) entrepreneurial approach to mission-oriented R&D by funding scientists and technologists to accelerate an immature energy technology with exceptional potential beyond the risk barriers that make it unlikely to attract private investment. ARPA-E does not fund discovery science nor does it support incremental improvements to current technologies. ARPA-E federal program managers take a "hands on" approach to managing the activities of R&D performers. The funding per project may be as low as \$500,000 or as high as \$10 million. Projects are selected on their potential to make rapid progress toward commercialization and to thereby reduce energy imports, reduce energy-related greenhouse gas and other emissions, and improve energy efficiency.
3. Each Energy Innovation Hub incorporates a large set of investigators spanning science, engineering, and policy disciplines focused on a single critical national need identified by the Department. Talent is drawn from the full spectrum of R&D performers (universities, private industry, non-profits, and government laboratories), who drive each Hub to become a world-leading topical R&D

center. Each Hub's management structure allows empowered scientist-managers to execute quick decisions to shape the course of research. With robust links to industry, the Hubs aim to bridge the gap between basic scientific breakthroughs and industrial commercialization. Awards for the Hubs were openly competed among R&D performers and are for up to \$22 million in the first year and up to \$25 million in years two through five, for a maximum of up to \$122 million over the five-year term, subject to availability of resources.

**Q6. DOE's domestic Fusion Energy Science program is facing lower funding levels due to increased financial contribution to ITER; a \$20 billion international fusion demonstration' project. Given the budgetary constraints, how will the Department continue to maintain a domestic fusion energy program in current budget environment?**

**A6. The Fusion Energy Sciences (FES) program is committed to maintaining a practical domestic fusion program even while supporting our contributions to ITER. The FY 2014 budget request provides resources that will continue a dynamic domestic fusion program that makes important contributions to resolving vital issues in fusion research. The FY 2014 budget request continues to build the scientific foundation needed to develop a future fusion energy source. We believe the program is positioned to obtain a high scientific return on our investment in ITER; address gaps in materials science required for harnessing fusion energy; continue stewardship of the broader plasma sciences; leverage cross-agency synergies; and provide opportunities for U.S. scientists to do research on new, billion-dollar-class international facilities where technology investments will enable investigation of a new class of scientific questions..**

**Q7. The Department is currently conducting a pilot program on a new technology transfer mechanism, known as "Agreements for Commercializing Technology." Please**

describe how these agreements differ from existing technology transfer mechanisms, namely Cooperative Research and Development Agreements and Work for Others agreements.

- a. How will DOE evaluate the overall effectiveness of the pilot program?
- b. On what metrics will the Department determine whether to extend or halt the pilot program?
- c. Under the current pilot program, entities that receive Federal funding are prohibited from entering into an ACT agreement with a Lab. Why has the Department placed that stipulation into the pilot program?
- d. The Energy Policy Act of 2005 required all recipients of DOE research and development funding to provide for a 20 percent cost share. The law also gave the Secretary of Energy the authority to reduce or eliminate the cost share.
  - a. Please provide the number of cost share waivers the Secretary has issued for the most recent three years of data, including the type of entity (i.e. National Lab, non-profit research entity, academic institution, or for-profit entity).
  - b. Please provide the total value of the waivers for the most recent three years of data.
  - c. Please provide the justification, as required by law, for each cost share waiver for the most recent three years of data.
  - d. What is the Department's position on repealing the statutory cost share requirement?

A7. Agreements for Commercializing Technology (ACT) enable DOE laboratories to engage with the private sector using terms that are more consistent with industry practices, while still providing Federal fiduciary oversight and ensuring that Laboratory personnel and resources are available to perform DOE mission work before they are committed to perform work for outside sponsors . Under ACT, DOE authorizes laboratory contractors to conduct third-party sponsored research using government-owned facilities and equipment for the purpose of furthering the Department's technology transfer mission. In exchange for the DOE laboratory contractor assuming

some of the risks and liabilities (e.g., indemnification and advance payment) normally borne by the third party sponsoring research at laboratories via CRADA or work for others (WFO) agreements, the laboratory contractors are authorized to charge sponsoring third parties for additional compensation beyond the direct costs of the work at the Laboratory. In addition, the laboratory contractors negotiate and execute ACT agreements using terms that may be more consistent with private sector business practices including a flexible framework for the negotiations of intellectual property rights.

- A7a. The Department will use multiple inputs to evaluate the pilot program before deciding how to proceed. The M&O laboratory contract clause authorizing performance of work under ACT establishes required data reporting that is provided by the laboratory contractor. DOE may request additional information to evaluate ACT processes and agreements during the pilot test stage. A decision whether to continue ACT following the pilot will be made based on many factors including but not limited to: effectiveness in improving technology transfer from the DOE laboratories; impact on contractor ability to achieve primary DOE mission goals; liability and long-term financial risk to Federal government. Other decisions may be whether to extend or expand the pilot to include additional DOE sites, and/or to make modifications to the current ACT model.
- A7b. As mentioned, a decision whether to continue ACT following the pilot will be made based on many factors including but not limited to: effectiveness in improving technology transfer from the DOE laboratories; impact on contractor ability to achieve primary DOE mission goals; liability and long-term financial risk to Federal government.

**A7c. Although there has been some discussion of the expansion of ACT for sponsors with Federal funds, there are very little data available suggesting that the DOE laboratories are losing work (from sponsors with Federal funds) due to any real and/or perceived limitations in the currently available technology transfer mechanisms like WFOs when a sponsor has Federal funds. The proposed implementation of an ACT-like transaction for sponsors with Federal funds raises several questions regarding the proper use of Federal funds, including whether it is appropriate to use Federal funds to pay for costs exceeding a laboratory's full cost of work performed (under ACT, contractors can charge an additional fee for assuming certain risks for the sponsor) and how to best ensure that there is full disclosure of such costs to both the sponsor and Federal agency funding the work.**

**In addition, ACT, as it is structured under the existing pilot program for privately sponsored work, does not translate to Federally funded sponsors. It should be noted that some of the key benefits provided through ACT, by law, are not applicable to projects with Federal funding. For example, extending the full terms (i.e., Intellectual Property terms) of ACT to Federally funded partners is not allowed under the Bayh-Dole Act (35 U.S.C. §§ 200-212), governing ownership and reserved Government rights in inventions made under Federal funding agreements. There are also potential issues with flow-down requirements contained in the agreement between the sponsor and the Federal agency that may conflict with the DOE facility contract.**

**The ACT pilot is still in the early stages and while several pilot sites have signed ACT agreements, so far, one laboratory accounts for more than 90 percent of the agreements. So it is not yet evident whether ACT will be successful and become a preferred**

approach when working with a DOE laboratory. DOE continues to collect feedback from representatives from each of the ACT pilot sites and the overall laboratory community. The Department believes it is prudent to consider ACT enhancements or changes after the results of the pilot have been analyzed and in the context of applicable Federal laws and regulations.

A7d.a. Note: The Energy Policy Act of 2005 cost sharing requirement does not apply to research and development “that is of a basic or fundamental nature,” if so determined by the Department. As such, The Office of Science has excluded its funded basic research programs from the requirement. (Sec. 988(b)(2)). The Act provides the Secretary broad flexibility to reduce or waive the cost share requirements for other types of R&D activity as deemed necessary and appropriate. In these circumstances the cost share is almost always waived by funding opportunity announcement (FOA) and not by award (i.e., the cost share is waived uniformly for all applicants to a given FOA and the waiver is stated within the FOA; the cost share is not waived selectively for certain awardees). Information on waivers for a specific type of entity is therefore not available. Most waivers cover universities, non-profit organizations and National Laboratories. Thirty-two waivers were issued for FOAs in Fiscal Year (FY) 2011-2013. There are two waivers approved so far for FY 2014.

A7d.b. Because the waivers are applied to an FOA, i.e. prior to selection and award, the total value of the waivers is not available. Not all funding recipients selected through such FOAs with cost share waivers have less than a 20 percent cost share; some meet or exceed this cost share level.

A7d.c. The Department will work to provide this information to your staff.

A7d.d. The Department is considering this matter in the context of proposed legislation and has not finalized its position.

## **QUESTIONS FROM REPRESENTATIVE JOSEPH KENNEDY**

**I would like to address our nation's fusion energy program, an issue that is important to me and one I believe is vitally important to the future of our country's energy security. The Department of Energy and the Administration's budget request has called for eliminating the MIT Alcator C-Mod facility, which has been operating since 1991. For more than 20 years, they have contributed invaluable scientists, research, and advancements to our national fusion program.**

**I am concerned about how the Administration has proposed this cut, and how you are balancing the direction of U.S. fusion programs and ongoing collaboration with the ITER project in France, which is still in early phases of construction. As I understand it, Alcator C-Mod has a compact, high-magnetic field design that gives it unique capabilities to carry out world-class fusion materials and plasma science research that will be important to ensuring the success of ITER or any other burning plasma reactor; and it does this at a fraction of the cost of other tokamaks at a similar scale. Yet, it does not appear to be in the future plans of the U.S. fusion program, at least in the eyes of the Administration.**

**Q1. Given the fact that Congress has not authorized its closure, can you speak to the current status of the MIT facility?**

**A1. The Alcator C-Mod facility is currently in a warm shutdown status. The facility is not operating, but the staff and equipment are maintained such that research operations could resume within one to two months. We plan to maintain C-Mod in this status while waiting for the final FY 2014 appropriation.**

**Q2. While I understand and believe international collaboration is critical in this field, I have concerns about the process by which this cut was carried out by the Administration on such an important facility. Can you speak to the Administration's plans and priorities when it comes to U.S.-based fusion facilities moving forward? How are you incorporating input from the research community and other stakeholders in the planning process?**

**A2. The Department of Energy continues to set a high priority on operation of our two existing experimental fusion facilities, the DIII-D facility at General Atomics in California and the National Spherical Torus Experiment facility at Princeton Plasma**



Physics Laboratory in New Jersey, to use their world-class and complementary capabilities to perform research in support of the ITER project and guide planning for future experiments. We will use our domestic facilities to maintain and develop world-leading research capabilities which can then be used to enhance our ongoing partnerships in the international fusion research effort. The scale of the cost of fusion facilities has reached the point where collaboration is essential. We can remain globally competitive by maintaining core competencies in key areas while our scientists have access to the best, complementary facilities in the world. Several nations have invested in billion-dollar-class facilities using superconducting magnet technologies. Such experiments have not been constructed in the United States. It is essential that U.S. scientists have access to these facilities so as to be engaged as their research programs mature. The potential payoff from a modest U.S. investment is great, and any international efforts will leverage U.S. capability. In this regard, as result of a competitive solicitation in FY 2013, MIT was selected to lead one of the two U.S. teams to participate in collaborations in two superconducting facilities in China and Korea.

The Fusion Energy Sciences Advisory Committee (FESAC) provides input from the fusion research community and other stakeholders. Several recent FESAC reports have informed the planning process. In particular, the FESAC report *International Collaboration in Fusion Energy Sciences Research: Opportunities and Modes* suggested that an effective mode of international collaboration would be to explore operating limits and control techniques in the flexible and well-understood U.S. facilities followed by international collaboration to extend the promising modes of

operation to long-pulse superconducting facilities abroad. The Department of Energy will continue to utilize FESAC when necessary and appropriate to obtain input from the community on issues of broad impact on the U.S. fusion research program.

**Q3.** In your written testimony and your dialogue with my colleague, Rep. Randy Hultgren of Illinois, you noted that the Lehman Review of the US ITER project would be submitted in October and that an international management review of ITER collaboration would be presented at the ITER council meeting on November 20-21. When will the results of these two reviews be available to the members of this committee and the public?

**A3.** The results of these reviews are considered pre-decisional, non-public information. However, the Office of Science would be willing to brief the Members of this Committee or the committee staff on the results of the reviews.

**Q4.** How can we continue to leverage the expertise of our fusion program to succeed in the ultimate goal of commercializing fusion energy?

**A4.** Four major scientific and technical issues must be resolved to achieve practical fusion energy: controlling high-performance burning plasmas, taming the plasma-materials interface, conquering nuclear degradation of materials and structures, and harnessing fusion power (i.e., breeding more tritium fuel than is consumed and converting fusion power into electrical power). The scientific and technical challenges associated with these issues are extraordinary and will require exceptional, world-leading experiments to address them.

If ITER succeeds, it will address the first issue and will contribute substantially to resolving the second issue. However, fully addressing all aspects associated with the second, third, and fourth issues will require integrated experiments that can investigate these three issues simultaneously. With this in mind, DOE's Fusion Energy Sciences

program will continue to support a strong domestic program as well as put a premium on developing international partnerships that leverage U.S. strengths and enable DOE to work in an international environment. Together, these investments will position the U.S. to sustain its international leadership in fusion energy science and develop the basis for fusion energy.



**Department of Energy**  
Washington, DC 20585

April 14, 2014

The Honorable Ed Whitfield  
Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On March 6, 2014, Adam Sieminski, Administrator, Energy Information Administration, testified regarding "Benefits of and Challenges to Energy Access in the 21st Century: Fuel Supply and Infrastructure."

Enclosed is the answer to one question that was submitted by Representative Lee Terry to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis".

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosure

cc: The Honorable Bobby L. Rush, Ranking Member



## QUESTIONS FROM REPRESENTATIVE LEE TERRY

**Q. In light of the data presented prior to and during the spike of propane prices, do you believe that an investigation by the FTC is warranted?**

**A. EIA does not usually state a view as to whether an investigation is warranted or not, as this is a policy issue. However, EIA does have some limited information that might help other agencies decide whether or not a review or investigation is warranted. The retail prices EIA reports are state averages collected by the state energy offices. EIA provides funding support for states to participate in the State Home Heating Oil and Propane Program (SHOPP) <http://www.eia.gov/petroleum/heatingoilpropane/>. This supports efforts to monitor the heating fuel markets in each State, to publish weekly average retail prices, as well as to develop and maintain programs which provide financial assistance for heating costs to low-income residents. EIA also has republishing rights for the weekly statewide average wholesale prices collected by a private vendor.**



## Department of Energy

Washington, DC 20585

May 6, 2014

The Honorable Mary L. Landrieu  
Chair  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Madam Chair:

On March 25, 2014, Adam Sieminski, Administrator, Energy Information Administration, testified regarding "Importing Energy, Exporting Jobs. Can it be Reversed?"

Enclosed are the answers to six questions that were submitted by Ranking Member Lisa Murkowski, Senator Maria Cantwell, and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in cursive script, reading "Christopher E. Davis", is positioned above the printed name.

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Lisa Murkowski, Ranking Member



## QUESTION FROM SENATOR LANDRIEU

Q1 What are the prospects for increased production in the Haynesville shale? As you know, rig counts have been going down for some time, but your testimony seems to indicate it could be due for a comeback. What is driving this resurgence and could increasing exports expand it further? And why?

A1 The number of drilling rigs in the Haynesville has risen from 45 in late 2013 to 54 as of March 2014. Recent increases in drilling activity and the high productivity of the wells currently being drilled has stemmed the decline in natural gas production from the Haynesville, which peaked at 10.5 billion cubic feet per day (Bcf/d) in November 2011 and has now stabilized around 6.5 Bcf/d in the first quarter of 2014. Natural gas production in the Haynesville is expected to increase in the coming months.

The Haynesville is currently an attractive and resurgent play for four reasons.

- Higher prices: With Henry Hub natural gas futures prices above \$4.00, producers see an opportunity to drill profitable wells even outside of the most productive acreage.
- Below-average natural gas storage levels: After a very cold winter, working natural gas inventory is below normal levels going into the April through October injection season. Increased natural gas storage demand is supporting higher prices, and producers in the Haynesville may deploy more rigs to meet this demand.

- Pipeline capacity: With ample pipeline capacity to bring natural gas to nearby markets, producers do not experience long delays to tie new wells into takeaway infrastructure, as can be the case with new wells in the Marcellus.
- Proximity to proposed LNG export facilities: The Haynesville shale play is located in relative close proximity to the Sabine Pass LNG export terminal project, of which the first 1.1 Bcf/d of capacity is expected start operations during the fourth quarter of 2015, with another 1.1 Bcf/d of export capacity from that facility expected to become operational within the following two years. There are other proposed LNG export facilities in the Gulf region, which, if built, would also support demand for natural gas from the Haynesville.

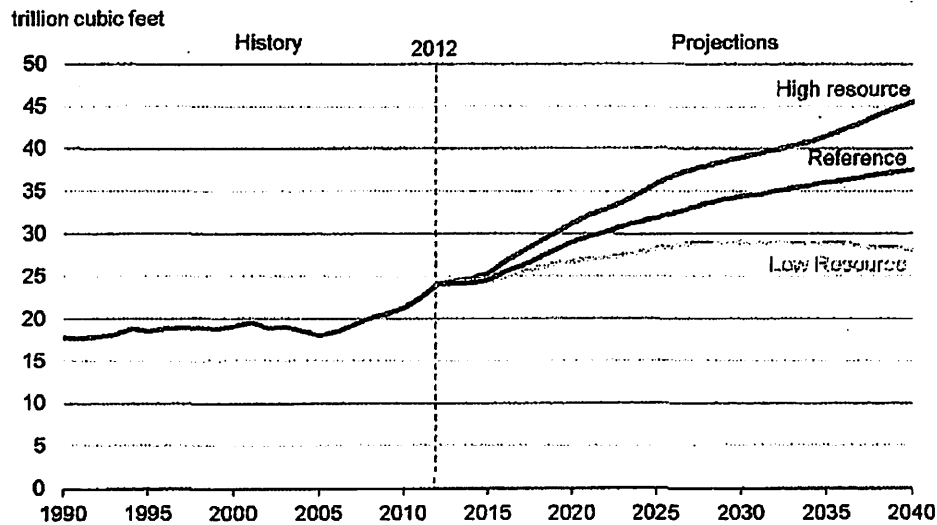


## QUESTION FROM SENATOR LANDRIEU

- Q2 Concerns around exports have often been based on concerns around long term U.S. supply. Since you have been Administrator, estimates of U.S. gas supply have consistently gone in only one direction-up.
- a. Is EIA confident in the long term stability of natural gas supply?
  - b. How have recent advances in technology and other factors contributed to this?
- A2 The U.S. has a relatively abundant supply of dry natural gas with technically recoverable resources at over 2,200 trillion cubic feet (Tcf) as of January 1, 2012. The growth in domestic natural gas production is supported primarily by increases in shale and tight gas investment and development, which is, in turn, supported by continual improvements in technology. Continued investment in the development of shale and tight gas is expected given the healthy demand growth for natural gas. In addition, further technological improvement and the continued application of 'best practices' in current developing plays will contribute to the economic viability of domestic natural gas supply. However, growth potential and sustainability of domestic production hinge around uncertainties in key assumptions, such as well production decline, lifespan, drainage areas, geologic extent, and technological improvement—both in areas currently being drilled and in those yet to be drilled. EIA reviews well-level production performances on a regular, on-going, basis and revises assumptions accordingly. The Low Oil and Gas Resource and High Oil and Gas Resource cases in the AEO2014 explore the effects of changes in Reference case assumptions about resource size and quality and technology advances. In all three cases, domestic natural gas production is projected to increase from the 2013 level of 24 Tcf. In the Reference case and the High Resource case, total natural gas production grows to 38 Tcf and 46 Tcf per year in 2040, respectively. In the Low Resource case, total natural gas

production plateaus at just under 29 Tcf per year from 2027 through 2036, then declines to 28 Tcf in 2040.

### Natural gas production across the AEO2014 Resource cases



Source: EIA, Annual Energy Outlook 2014

An article in the Issues in focus section, “U.S. tight oil production: Alternative supply projections and an overview of EIA’s analysis of well-level data aggregated to the county level,” provides more information on the alternative resource cases.

## QUESTION FROM SENATOR MURKOWSKI

Q1 Has the Energy Information Administration noticed any supply disruptions or price dislocations resulting from increased natural gas exports via pipeline to Mexico and Canada in recent years?

A1 EIA has not noticed any supply disruptions or price dislocations resulting from increased natural gas exports via pipeline to Mexico and Canada in recent years. U.S. natural gas exports via pipeline have grown 46% between 2010 and 2013.

U.S. natural gas pipeline exports to Canada accounted for 58% of total U.S. pipeline exports in 2013. The 911 billion cubic feet (Bcf) that was exported in 2013 is a 23% increase over 2010 export levels. Most U.S. natural gas exports to Canada occur at St. Clair, Michigan, which accounted for about 64% of total exports to Canada, although some of the gas exported at St. Clair originates in Canada. While exports have risen and imports have decreased in recent years, the United States was still a net importer from Canada in 2013.

In 2013, U.S. natural gas exports to Mexico were nearly double the level they were in 2010. In 2013, the U.S. exported a record 658 Bcf to Mexico. Exports to Mexico are largely used to supply electric power plants. As such, natural gas exports to Mexico show levels of seasonality counter to the majority of U.S. gas, peaking during the summer rather than winter months, when electric demand in Mexico is higher due to increased air conditioning load.

## QUESTION FROM SENATOR MURKOWSKI

- Q2 The EIA forecasts certain levels of LNG exports from the U.S. in its reference case. Do you expect these export levels to have any impact on global LNG markets (e.g., on price, contract negotiations, etc.)?
- A2 EIA expects that introducing new lower priced supplies from the United States into the LNG market will place downward pressure on LNG prices and provide some additional leverage for buyers during contract negotiations, particularly in Asia. The degree that prices actually fall will also depend on additional supply, as well as demand, in the rest of the world. EIA is projecting U.S. LNG exports to reach 3.7 trillion cubic feet (Tcf) by 2030, with world LNG volumes at 20.6 Tcf. For perspective, in 2012, LNG supplied 12 Tcf or 10% of world consumption, imports via pipelines supplied 21%, and domestic production supplied the remaining.

While EIA has not studied the current or potential impact of U.S. LNG exports on contract negotiations, there is some anecdotal evidence and expert opinion that having potential U.S. LNG exporters negotiating with potential buyers around the world is influencing other contract negotiations, even before the United States has started to export LNG.

### **QUESTION FROM SENATOR MURKOWSKI**

**Q3** Does the Department of Energy's Office of Fossil Energy have access to the latest EIA data and analysis pertaining to U.S. natural gas production and consumption, and forecasts of both?

**A3** All of EIA's data and analyses pertaining to U.S. natural gas production and consumption, and forecasts of both, are published on EIA's website. Staff within EIA and the Office of Fossil Energy have productive working relationships and regularly interact on both data and analysis issues, but there are no special access arrangements.

## QUESTION FROM SENATOR CANTWELL

Q1 During the hearing, there was much discussion of the analysis and forecasting of the effects of different levels of liquefied natural gas exports. I note that considerable government resources have been spent, and will continue to be spent, to ensure that our natural gas export policy remains in the public interest.

I am concerned that no such analysis yet exists to consider the effects of a potential reversal of the long-standing ban on crude oil exports. On February 3rd (over seven weeks ago), then-Chairman Wyden and I requested that your Administration look into potential market impacts of such a major policy change. While I understand that this kind of analysis requires considerable time and attention, I am concerned that it is not yet clear what kind of analysis EIA plans to undertake on this issue.

Our constituents would feel the impacts of any market changes that would be associated with such a major policy change, both in terms of prices that they would pay at the pump and the increased quantities of oil that would be finding new export transit routes, potentially via rail through Washington State.

How can we assure our constituents that their federal government will consider this issue thoroughly and thoughtfully?

A1 The potential reversal of the long-standing ban on crude oil exports is one of a number of issues related to the implications of the dramatic rise in domestic oil production that the Energy Information Administration (EIA) is considering and about which EIA has already published information (see list that follows). EIA is continuing to analyze and address these issues and implications and intends to publish a series of focused analyses that will address effects of a possible relaxation of current limitations on U.S. oil exports as well as the following topics and issues related to the implications of the dramatic rise in domestic crude oil production:

- growth in U.S. oil production and trends in liquid fuels consumption
- impacts on oil logistics and refining
- crude oil and petroleum product prices
- crude oil and petroleum product trade patterns

Because of the dynamic nature of the U.S. crude oil and petroleum products markets, EIA intends to publish its findings in stages over the course of 2014. This will ensure that the most up-to-date data is incorporated in its work.

#### **Short Term Energy Outlook**

3/11/2014 STEO: EIA expects net import share to decline to 25% in 2015, lowest level since 1971

#### **Annual Energy Outlook**

12/16/2014 Slide 10: U.S. maintains status as a net exporter of petroleum products

#### **Today In Energy**

3/24/2014 China is now the world's largest net importer of petroleum and other liquid fuels  
2/25/2014 Oil net imports have declined since 2011, with their value falling slower than volume  
1/30/2014 Americas are an important market for liquid fuels and natural gas trade  
1/22/2014 Oil and natural gas import reliance of major economies projected to change rapidly  
1/9/2014 U.S. crude oil production growth contributes to global oil price stability in 2013  
10/4/2013 U.S. expected to be largest producer of petroleum and natural gas hydrocarbons in 2013

#### **This Week in Petroleum**

3/12/2014 U.S. crude oil production in 2013 reaches highest level since 1989  
1/23/2014 Crude oil imports continue to decline  
1/8/2014 Strong U.S. crude oil production growth forecast through 2015  
1/3/2014 Shifting production, demand patterns alter oil markets in 2013  
10/30/2013 Recent decline in Gulf Coast crude oil imports mainly affects lighter grades  
9/18/2013 Rail is Likely Supplying an Increasing Share of East Coast Crude Oil  
8/14/2013 New Traffic Patterns Emerge to Supply Crude Oil to West Coast Refiners  
7/10/2013 U.S. crude oil increasingly moves by barge, truck and rail  
5/30/2013 Eastern Canadian refineries are increasing their use of U.S.-sourced crude oil  
5/1/2013 Absorbing Increases in U.S. Crude Oil Production  
4/3/2013 Mid-Continent Crude Oil Markets Continue to Adjust to Rapid Rise in Bakken Production  
3/20/2013 Total U.S. crude oil imports continue to decline in 2012 but regional differences persist  
1/16/2013 Upcoming Pipeline Capacity Additions Will Facilitate Continued Growth in Crude Oil Shipments from Midwest to Gulf Coast  
1/9/2013 Strong U.S. Crude Oil Production Growth Forecast Through 2014  
11/28/2012 Market Implications of Increased Domestic Production of Light Sweet Crude Oil  
10/26/2012 The Impact of U.S. Crude Oil Production on Gulf Coast Crude Imports



## Department of Energy

Washington, DC 20585

May 13, 2014

The Honorable Tom McClintock  
Chairman  
Subcommittee on Water and Power  
Committee on Natural Resources  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On March 25, 2013, Christopher M. Turner, Administrator, Southwestern Power Administration; Mark A. Gabriel, Administrator, Western Area Power Administration; Kenneth E. Legg, Administrator, Southeastern Power Administration; and Elliot E. Mainzer, Administrator, Bonneville Power Administration, testified regarding *"Examining the Proposed Fiscal Year 2015 Spending, Priorities and the Missions of the Bureau of Reclamation, the Four Power Marketing Administrations and the U.S. Geological Survey's Water Program."*

Enclosed are the answers to 10 questions that were submitted by Chairman Doc Hastings, Representatives Bradley Byrne and Jim Costa to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in cursive script, reading "Christopher E. Davis", is positioned above the printed name.

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Grace F. Napolitano, Ranking Member





## **QUESTIONS FROM CHAIRMAN HASTINGS**

**Q1:** What contractual relationship does BPA have to provide funding to Reclamation for the operation of the John W. Keys III Pump-Generating Plant (JKPGP)?

**A1:** BPA repays the power share of the Grand Coulee Dam's authorized project purposes under congressional legislation authorizing the construction of the dam. That repayment authority extended to the John W. Keys III Pump-Generating Plant (Keys Plant) when it added power generating capabilities. Originally, BPA repaid the United States Treasury for its share of the operating costs of the Grand Coulee Dam which were appropriated annually by Congress. In 1996, BPA and Reclamation established an interagency direct funding agreement for the operating costs of Grand Coulee, including for the Keys Plant.

**Q2:** What contractual relationship does BPA have to provide advance funding for the operation of the John W. Keys III Pump-Generating Plant?

**A2:** BPA and Reclamation have a 1993 direct funding agreement that allows BPA to provide upfront funding for capital improvement projects at Grand Coulee Dam. BPA and the Bureau are working on a sub agreement for funding capital investments at the Keys Plant.

## QUESTIONS FROM REPRESENTATIVE BYRNE

Administrator Legg, most would argue that the success of federal Power Marketing Administrations (PMAs), and especially SEPA, stems from maintaining a limited focus and a dedication to keeping costs as low as possible.

In recent years, however, the Corps of Engineers has changed operations at the projects that generate the power marketed by SEPA. For example, the Corps has allowed withdrawals from Lake Lanier in Georgia for water supply purposes to serve Atlanta area needs without full regard for the original congressionally authorized purposes of the reservoir, the cost to current hydropower customers, or for the detrimental effects such a departure will have on sustainable and reliable energy generation moving forward.

These withdrawals have been pursuant to water supply contracts that expired in 1990 and the Corps has charged highly inadequate rates, based on these expired contracts, to water supply utilities that have resulted in continuously decreasing contributions to the costs of operations and maintenance at the Corps projects over the past 25 years. Meanwhile, hydropower customers have continued to pay increasing rates and have seen a decrease in peak power available from Corps projects. This practice will continue until the Corps completes an updated water control manual for the system in question and brings current water supply operations under contract.

Q1: Administrator Legg, when the Corps of Engineers changes operations at a project or accommodates a use that Congress did not authorize, does that have an impact on the amount of power that your agency is able to deliver?

A1: Yes. While the amount of energy may be similar over a period of time, operational changes can affect the timing of hydropower generation on an hourly, weekly or seasonal basis. These changes may result in a reduction in availability of the peaking generation resource which Southeastern utilizes to satisfy customer power requirements.

Q2: Administrator Legg, when the Corps of Engineers allows uses at its projects that were not originally authorized by Congress, and it does not charge for those uses, do the originally authorized uses such as hydropower subsidize the new use?

A2: If the Corps allows additional uses at its projects and does not reevaluate project cost allocations, an overall reduction in power benefits and an increase in power rates may occur.

**Q3:** In considering the use of the Corps projects for water supply, from your perspective have the water supply utilities paid a proportionate share of the Corps operations and maintenance expense since the beginning of the litigation over the use of Lake Lanier?

**A3:** Southeastern is in support of the Corps developing a more accurate valuation of water within its managed basins. A new policy could take into account the continued trend of increasing water withdrawals from the basins, which reduces water availability for other project purposes and may result in reduced hydropower generation.

**Q4:** If the Corps does not hold new users responsible for a fair share of operations and maintenance costs, do the hydropower customers pay a disproportionate share? Has anyone within SEPA calculated this cost?

**A4:** If the Corps allows additional uses of its projects, the hydropower purpose may be responsible for recovering a share of the cost. SEPA has not attempted to calculate this cost.

## QUESTIONS FROM REPRESENTATIVE COSTA

### Questions for WAPA Administrator (Mark Gabriel)

- Q1. We understand that Western studied the feasibility of joining the CAISO's Energy Imbalance Market in the west and concluded that the costs would outweigh the benefits at this time. How will Western ensure that its assets are not negatively impacted from the CAISO's market re-design, or other market re-designs in the future?
- A1. The referenced Study recommended that Western continue to monitor the CAISO Energy Imbalance Market (EIM) and other market activities within the Western Interconnection and, continue to work with and inform its customers about these market related activities. Western actively reviews and analyzes market activities on an on-going basis to assess impacts and make decisions regarding market participation.

Western continues to monitor the CAISO EIM activities in a coordinated fashion with their customers, interconnected utilities, the Bonneville Power Administration (BPA) and others. Western participates with these various entities in the CAISO EIM stakeholder forums, the Public Utility Commission (PUC) EIM forums, the Western Electricity Coordinating Council's Market Interface Committee, and the BPA Technical Forums addressing the potential impacts to BPA as a result of PacifiCorp's participation in the CAISO EIM.

Western has also intervened at the Federal Energy Regulatory Commission (FERC) as an interested party in docket ER14-1386, the CAISO EIM initiative. Intervening as an interested party will assure that Western will be able to closely monitor all proposed business process/tariff changes, and as appropriate, bring to FERC's attention, any

business process changes which will negatively affect the way Western is able to carry out its statutory duties to its project use and preference power customers. In addition, as part of implementing EIM, Western has registered to participate in market simulation activities.

Additionally, Western's Regions, in concert with their customers, interconnected utilities and others, continue to participate in various regional initiatives within the Western Interconnection assessing the magnitude of variable energy resource integration, their potential impacts on the grid and identifying alternative solutions to the CAISO EIM to address these impacts on a regional basis.

- Q2. Central Valley Project power customers have paid up to a \$15 per Megawatt-hour adder for the CVPIA Restoration Fund since 2005, including Redding Electric Utility customers in my district that pay over \$2 million per year. How do you plan to ensure that Central Valley Project power remains financially viable, specifically in a drought year such as this where power customers could expect lower than average electricity generated but a higher than average power cost per megawatt-hour?
- A2. Western is concerned about the long-term price competitiveness of the Federal hydropower product from the Central Valley Project (CVP), and has been working with the Bureau of Reclamation (Reclamation) to develop a cost sharing formula to assess contributions into the Central Valley Project Improvement Act (CVPIA) Restoration Fund on a proportional basis. The goal of revising the cost sharing formula is to ensure that maximum CVPIA Restoration Fund assessments on a percentage basis would not exceed the allocated CVP capital investment cost percent allocated to the preference power function.

Western supports implementation of a revised cost sharing formula and has been working with Reclamation to explore potential revisions. As part of this effort, Western has encouraged Reclamation to develop a more project management-centric approach which focuses more on the systematic setting of goals and objectives; measuring/monitoring activities; and focusing funding on those activities which have a demonstrated history of success. Western is encouraging Reclamation to focus its efforts to ensure the timely completion of CVPIA-mandated restoration activities so that at the earliest opportunity possible, restoration-related goals may be realized, a determination of project completion can be made, and the associated 50 percent reduction in annual CVPIA Restoration Fund assessments can be achieved.

Q3. How does Western plan to address cyber and physical security of its assets?

A3. Western's physical and cyber security program is continually working to stay ahead of the current threats and vulnerabilities to the power system. Our programs are focused on ensuring appropriate levels of protection are implemented in a manner consistent with the criticality of the sites we protect. Egregious acts, such as unauthorized access, theft, diversion, loss of custody, espionage, loss of sensitive and/or classified information or government property, and other hostile acts may cause adverse impacts on national security or on the health and safety of government and contract employees, the public, and the environment. Our program efforts include:

**Infrastructure Protection:** Strategies include developing and implementing risk based security measures and response by deploying state-of-the-art security technology and security control procedures at Western's facilities.

**Assessments:** Western continues to conduct threat and vulnerability assessments for identifying, quantifying, and prioritizing/ranking our infrastructure protection strategies. These assessments include identifying key assets, ranking them based on criticality, identifying the potential threats and vulnerabilities, and implementing new mitigation strategies, with performance testing.

**Background Investigations:** Western conducts risk designations and appropriate level background investigations on all Western government and contractor employees based on the determined risk level assigned to each position.

**Liaison:** Western has ongoing liaison with Federal and local law enforcement agencies across 15 states to continue partnering and educating them on the importance of our infrastructure, needed response, and the crime statistics and trending.

**Partnering:** Western is partnering within our industry to share specific security information related to trends and incidents. This will allow us and our partners to better plan and respond to incidents. Western participates in the Departments Cooperative Protection Program (CPP), The Cyber Security Risk Information Sharing Program (CRISP), and the Enhanced Cybersecurity Program. Western is tightly integrated with the Departmental Joint Cybersecurity Coordination Center (JC3). A cornerstone of the effort is to improve on components management, system identification and software

inventory to understand what is on the network and to be able to identify when something doesn't belong there. Robust change management is in place to control risk introduced through change processes.

**Employee Awareness:** Western has ongoing employee awareness and training programs. This includes informing employees of their shared responsibilities in security and to report all unusual activity immediately. Western also stresses the importance of ensuring safety while responding to facilities during scheduled and unscheduled work. Training topics include: incident reporting, emergency management, facility access, escort procedures, and counterintelligence.

Western is incorporating physical and cyber security into our routine, Enterprise Risk Management and Asset Management programs. However, we fully expect the cost to secure our assets and safeguard the Federal hydro electric transmission system to increase due to routine lifecycle obsolescence of existing security systems and as physical and cyber security threats continue to increase in frequency and severity. Additionally, the impacts of these threats extend not just to our hydropower delivery obligations but also to the broader bulk electric system.

- Q4. What is the current status of Western's Access to Capital Initiative? How do you respond to your customer's objection that this Initiative was devised only as a way to force them to pay for intermittent energy transmission development that these customers may not support voluntarily because they would see no benefit?
- A4. The Access to Capital Initiative was an effort that began in December of 2012 and ended in June of 2013. Western is now engaging our customers through our Strategic Roadmap and our Asset Management Program to develop a Sustainable Funding Strategy for the



future. Western has worked with its customers in developing a regionally based 10-year financial planning process.

As Western looks to help power the energy frontier, we need to create a clear vision of our role in the industry, with our customers, and within the Federal government. Since the summer of 2013, we have actively collaborated with customers, stakeholders, DOE, and our employees to develop a strategic roadmap that will serve as the guide to our mission in a changing industry through 2024 and beyond. To be clear, Western is not changing its mission to market and deliver clean, renewable, reliable, cost-based Federal hydroelectric power and related services, but rather exploring how that mission is best implemented in a changing world.

With a solid vision of where Western is headed and the roadmap to get there, we also need to have a very clear picture of where we are today. Asset management helps provide that picture. Asset management is a comprehensive, data-driven program that optimizes the use of equipment, facilities, and operations to meet performance standards.

The Strategic Roadmap provides the vision of where we are going. The data available from our Asset Management Program and the Western-wide 10-year capital investment plans lay the foundation for a solid funding strategy that will provide the analytical basis to articulate Western's infrastructure needs into the future.



## Department of Energy

Washington, DC 20585

May 14, 2014

The Honorable Tim Murphy  
Chairman  
Subcommittee on Oversight and Investigations  
Committee on Energy and Commerce  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On February 11, 2014, Dr. S. Julio Friedmann, Deputy Assistant Secretary for Clean Coal, Office of Fossil Energy, testified regarding "Department of Energy Oversight: Status of Clean Coal Programs."

Enclosed are the answers to seven questions submitted by you for the hearing record.

Also enclosed are six Inserts that were requested by Representatives Cory Gardner, Bill Johnson, Billy Long, and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis".

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Diana DeGette, Ranking Member



## QUESTIONS FROM REPRESENTATIVE TIM MURPHY

Q1. At a September 20, 2012 hearing before the Energy and Commerce Committee's Energy and Power Subcommittee, a representative for Alstom, a maker of Carbon Capture and Storage (CCS) related technology, testified that "it is unaware that any supplier of [CCS technology] is ready or able to offer commercial guarantees for...full scale systems of carbon capture." The representative testified that "the final stage to reach commercial status is to perform a demonstration at full commercial scale...It is critical to be at commercial scale to define the risk of offering the technology. This cannot be defined until the technology can be shown to work at full scale. This is the first opportunity that we have to work with the exact equipment in the exact operating conditions that will become the subject of contractual conditions when the technology is declared commercial and is offered under standard commercial terms including performance and other contractual guarantees." In your response on February 11, 2014 to a question by Rep. Griffith about those commercial guarantees, you stated that, since the Alstom testimony, "a number of those companies have actually, do now offer performance guarantees." Are the performance guarantees you reference in your testimony the same as the manufacturer's commercial guarantees described in the September 2012 testimony?

- a. If so, have these guaranteed technologies been demonstrated in CCS systems in operating electric generating units at full commercial scale, sufficient to define the risks in the exact operating conditions that will become the subject of contractual conditions when the equipment is offered under standard commercial terms?

A1a. Although some CCS suppliers have stated their willingness to provide performance guarantees, the extent of the terms, conditions of those guarantees and the enforceability are not known at this time. The guarantees typically cover such things as the amount of CO<sub>2</sub> captured per day, the purity of the product, and the energy consumption required by the process. If one of the guaranteed performance specifications is not met, the supplier typically has to rectify the problem and/or pay liquidated damages. For guarantees provided to current CCS demonstration projects, it is likely the extent of the damage payments is significantly less than what would be expected for a more widely deployed technology. DOE has successfully demonstrated for the past year, a CCS project on a commercial scale. For example, the Air Products CCS demonstration project – funded in

part by the Department – has been capturing CO<sub>2</sub> since May 10, 2013. DOE also has other projects that are near completion and will become operational soon thereafter.

- b. Identify the specific technologies and specific companies offering performance guarantees that support your testimony, and whether the manufacturers will warrant these technologies for use in utility-scale commercial service on coal-based electric power plants.

A1b. There are three companies that have provided performance guarantees for utility-scale CCS projects. More detail can be provided in a manner that allows for the safeguarding of confidential business information. However, we can state that we have successfully demonstrated for the past year, a CCS project on a commercial scale utilizing CO<sub>2</sub> Capture from Steam Methane Reformers.

Q2. In response to a question to confirm that CCS has not being implemented commercially at full scale on a functioning electric power plant, you disagreed and provided the example of the Beulah, North Dakota Gasification Facility, claiming this industrial facility was a power plant because it supplied natural gas that may be used in power plants.

- a. Does the Beulah facility represent successful demonstration of CCS systems on a commercial, coal-based electric generating unit that is supplying electric power to the electric grid?

A2a. The Great Plains Synfuels Plant is a commercial-scale coal gasification plant that manufactures natural gas. Synthetic natural gas (SNG) is a gaseous fuel manufactured from coal using the coal gasification process. SNG produced at the Great Plains Synfuels Plant leaves the plant through a two-foot in diameter pipeline that transports the gas 34 miles to a gas portal on the Northern Border Pipeline.

The Great Plains Synfuels Plant also produces a variety of coproducts including about 50 billion standard cubic feet of carbon dioxide annually. Since 2000, more than 25 million

tons of CO2 has been captured, compressed and transported through a 205 mile pipeline to oil fields near Weyburn, Saskatchewan, Canada for use in enhanced oil recovery.

- b. What is the history of DOE's loan guarantee in support of the plant? What was the taxpayer liability, in 2014 dollars, after the partners defaulted on the DOE loan?

A2b. In the early 1980's, the Department of Energy (Department) guaranteed a \$1.5 billion loan for the construction of a facility for converting coal into synthetic natural gas near Beulah, North Dakota. In 1985 the partnership which developed the Great Plains Coal Gasification Plant (Plant) experienced financial difficulties and defaulted on their \$1.5 billion loan. The amount of \$1.55 billion dollars of loan guarantee default in 1985 would convert to \$3.37 billion in 2014 dollars (Calculated using the Bureau of Labor Statistics CPI data.) The Department repaid the lender and operated the facility from 1985 through 1988.

In October 1988, the Department sold the Plant to the Dakota Gasification Company (a subsidiary of Basin Electric Power Cooperative) for 1) \$85 million, 2) a share of future revenues which ultimately totaled more than \$390 million, and 3) secured a waiver of tax credits valued at about \$750 million.

- Q3. In your testimony, you mentioned an \$8 billion loan guarantee solicitation, which was released on December 13, 2013 and covers a broad range of advanced fossil energy projects.
- a. The loan guarantees under this new solicitation are authorized by Title XVII of the Energy Policy Act of 2005 and will be administered by DOE's Loan Programs Office, correct?
  - b. Advanced fossil energy projects include technologies such as carbon capture, correct? What kinds of projects do you plan to support under this program?
  - c. How will they be similar to and/or differ from the existing major demonstration projects in CCS.

A3a,b,&c. The Advanced Fossil Energy Projects solicitation is authorized by Title XVII of the Energy

Policy Act of 2005 through Section 1703 of the Loan Guarantee Program and is administered by the Department's Loan Programs Office (LPO).

Under the Title XVII program, these loan guarantees are made available to support projects that employ new or significantly improved technology, are located in the United States, reduce, avoid, or sequester greenhouse gases, and have a reasonable prospect of repayment of both principal and interest. For more information, please reference the solicitation materials on the Loan Programs Office website: <http://lpo.energy.gov/resource-library/solicitations/advanced-fossil-energy-projects-solicitation/>

- Q4. DOE indicated that it expected the initial applications under this new loan guarantee program by the end of February 2014. Did DOE receive any applications by February 28, 2014 that relate to CCS technologies for coal-based power plants?
- a. If so, describe how many and the types of projects.
  - b. What timeframe do you anticipate for awarding these loan guarantees and for the full implementation of the underlying advanced fossil energy projects?

- A4. DOE has received applications under the initial February 28, 2014 Part I application deadline.

DOE anticipates additional applications in response to the future deadlines given the time required to develop projects and complete applications.

Under this solicitation, applications will undergo a two-part review: Part I will determine the initial eligibility of a project and whether it is ready to proceed. Applications that clear Part I then proceed to Part II, which includes the full application process and continued due

diligence. Viable projects that are granted a conditional commitment from DOE then undergo the complete underwriting process and negotiation of terms for the loan guarantee.

Q5. You suggested that the Environmental Protection Agency's requirement of CCS use by the power sector would facilitate state utility commission authorization of cost recovery for CCS through consumer rates.

a. When do you expect state utility commissions to authorize consumer rate-based cost recovery for non-government-subsidized CCS meeting EPA standards?

A5a. Please note that DOE has no jurisdiction over state utility commission decision-making processes and each state utility commission is unique. We offer the following perspective in response: Many factors are considered when a state utility commission authorizes consumer rate-based cost recovery for any new power project. The cost of the technology is certainly one constraint, but other factors may be in play in specific scenarios which would encourage the use of more expensive technologies such as CCS. For instance, coal based systems provide ancillary services and reliability, and diversify the fuel mix, which may be necessary in some situations.

The timeframe for acceptance and deployment of any individual technology will depend on a number of factors in addition to cost, including but not limited to external system constraints that may provide the right market conditions earlier than expected. In addition, highly constrained areas that require base load power in the absence of strong natural gas infrastructure, the proximity to economic enhanced oil recovery opportunities and expectations about future carbon policy may make first generation technologies attractive in some early cases, without government subsidies.

- b. Explain how state utility commission could authorize such consumer rate-based cost recovery for non-subsidized-CCS, given the prevalence of cheaper generation source alternatives. Upon what rationale would a state utility commission make such an authorization given competing availability of natural gas and nuclear fueled power generation?

A5b. Please note that DOE has no jurisdiction over state utility commission decision-making processes and each state utility commission is unique. We offer the following perspective in response: When a power system is chosen, its goal is to meet specific site and system requirements using a mix of available information including forecasts of future situations. Factors such as fuel diversity, system reliability, and other benefits a technology can provide are part of the consideration. The positives and negatives are weighed, with cost being only one of those factors.

State utility commissions could authorize rate recovery based on those considerations. In some instances, the electricity system has a requirement for a specific type of technology. Coal plants with CCS may diversify the fuel mix and reduce a region's dependence on a single fuel type. A plant may also provide baseload power with high capacity factors, stable, consistent fuel prices, and provide stronger reactive power and voltage control. These ancillary services may be necessary for the system, and coal with CCS could be uniquely positioned to do so. If the right mix of requirements, including future anticipated needs, can be met at an acceptable cost to the state utility commission, they may allow a non-subsidized-CCS plant.

Q6. DOE's Energy Information Administration (EIA) recently reported in its 2014 Annual Energy Outlook that, after the addition of current demonstration projects, there will be no increase in coal-based electricity generation in the United States for up to 30 years.



- a. If market and regulatory factors indicate no new coal power capacity, please explain where DOE will find the facilities to demonstrate its CCS technologies for coal-based power at utility scale.

A6a. DOE typically pursues technology demonstrations utilizing a mix of projects that include the entire plant and smaller projects to integrate and demonstrate specific new technology components, also keeping in mind what is most likely to be successfully replicated on a commercial scale. Our current focus is the construction and operation of the existing portfolio of demonstration projects.

- b. What are you doing, if anything, to adjust your program goal and development and demonstration plans to reflect these EIA projections?

A6b. DOE's Clean Coal Research Program will continue to focus on providing advanced technology options that produce affordable, efficient, low-carbon electricity from coal.

Q7. You stated that you hoped to see an increase in large scale deployment of CCS so it would manage 12-20% of U.S. emissions by 2050.

- a. To attain such widespread deployment, how many power plants does DOE assume would implement CCS in the ensuing time period; how many over the next five years and in each five year period between now and 2050?

A7a. Through the CCPI, we are currently demonstrating the first generation set of technologies for application in new plants and retrofit to existing plants. The Office of Fossil Energy will continue to explore transformational technologies for future power systems. In the post-2020 timeframe, we may see the retirement of many base load units, which could result in the need for additional base load power plants.

The latest outlook from Annual Energy Outlook projects energy sector CO<sub>2</sub> emissions to be about 5,700 million metric tons in 2040. The reduction of CO<sub>2</sub> will come from a

variety of sources which are difficult to predict and model this early. A portion will likely come from the expansion of renewable technologies and fuel switching. We believe that industrial CCS projects can provide some of the early experience in CCS, and also encompass a large number of point sources.

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1862           Mr. {Klara.} Yeah.

1863           Mr. {Johnson.} Same thing? Over the past several  
1864 years, the president's budget request for coal R&D funding  
1865 has steadily declined from a request in fiscal year 2010 for  
1866 \$404 million to most recent request in fiscal year 2014 for  
1867 \$277 million. Congress did not agree with these levels of  
1868 funding and recently passed an omnibus appropriations bill  
1869 increasing the funding by more than \$100 million. So what  
1870 does this say about your department's aggressive planning and  
1871 the administration's priorities to advance coal technology if  
1872 you are cutting funding for this work?

1873           Mr. {Friedmann.} Thank you again for that question. We  
1874 recognize that the budget process is complicated, that there  
1875 are many, many competing interests, and so we make our  
1876 requests. And we make our recommendations to the secretary,  
1877 and the secretary brings those to OMB and to the White House.  
1878 And together they figure out what is in fact what they want  
1879 to put into an omnibus budget.

1880           I would say that in general I think about these kinds of  
1881 questions as a tradeoff with urgency. The more urgency one  
1882 has, the more one is willing to spend on any particular

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1883 issue.

1884 Mr. {Johnson.} I understand the budget process, and I  
1885 realize there are conflicting priorities. But do you agree  
1886 with the additional funding levels that Congress has  
1887 appropriated?

1888 Mr. {Friedmann.} What I would say is that we have very  
1889 clear ideas about how we would use that well.

1890 Mr. {Johnson.} Good, because that was my last question.  
1891 And I am sorry. I got 15 seconds so let me get that one in.  
1892 Would you please submit to this subcommittee how you plan to  
1893 spend this additional funding?

1894 Mr. {Friedmann.} Yeah, we will be happy to take that  
1895 question for the record--

1896 Mr. {Johnson.} Okay.

1897 Mr. {Friedmann.} --and to have follow up with  
1898 additional meetings.

1899 Mr. {Johnson.} All right, thank you. Mr. Chairman, I  
1900 yield back.

1901 Mr. {Murphy.} The gentleman yields back. And now  
1902 recognize the gentlelady from North Carolina, Ms. Ellmers,  
1903 for 5 minutes.

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The Department plans to spend the additional funding for the Coal Research Program by continuing to support research and development of second generation and transformational technologies that reduce the cost of carbon capture, improve efficiency of power plant operations, and ensure safe permanent storage of carbon dioxide. Funding plans include the following:

- Carbon Capture will continue laboratory, bench, and small pilot scale tests for second generation and transformational technologies. This includes continued support for the National Carbon Capture Center, recently completed.
- Carbon Storage:
  - Will implement activities in the appropriations language for enhanced oil recovery technologies and continue the support for the large-scale injection tests of the Regional Carbon Sequestration Partnerships.
  - Has released a funding opportunity announcement for Geologic Storage Technologies to address key questions associated with CO<sub>2</sub> injection such as geomechanical effects and reservoir and seal behavior.
- Advanced Energy Systems:

- The Fuel Cells activity is addressing the technical challenges to commercialization, specifically cell performance, reliability and durability, and will advance and test progressively larger solid oxide fuel cell systems (~ 60 kWe) that will be the building block for commercial solid oxide fuel cell systems.
- Efforts are also being expanded in Gasification on novel polygeneration concepts that will build upon prior scoping studies.
- Crosscutting Research:
  - Will support efforts on water management by identifying key opportunities to reduce water consumption and to add new water supplies (e.g., derive revenue for waste-water treatment products and to further improve the use of alternative water streams currently being wasted).
  - Computational tools such as those being developed by the National Risk Assessment Partnership (NRAP) and the Carbon Capture and Simulation Initiative (CCSI) will also be continued. NRAP will develop Integrated Assessment Model Development with Monitoring and Mitigation for Risk-based Monitoring and Mitigation Protocols for Long-Term Carbon Storage and CCSI will support the initial deployment of the CCSI Toolset to industry users.

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1967 confluence of opportunity, resource, and revenue.

1968           Mrs. {Ellmers.} Just and there again, and I am probably  
1969 just asking you to speculate on this. But how many would you  
1970 say that would be? When you say niche, are we talking about  
1971 a small--like one to five?

1972           Mr. {Friedmann.} Maybe a few dozen.

1973           Mrs. {Ellmers.} A few--okay, so 24--

1974           Mr. {Friedmann.} But I would not consider that  
1975 widespread.

1976           Mrs. {Ellmers.} --across the country about.

1977           Mr. {Friedmann.} Just kicking around numbers, sure.

1978           Mrs. {Ellmers.} Okay, that is good, and I appreciate  
1979 that. Thank you very much. Mr. Chairman, I yield back the  
1980 remainder of my time.

1981           Mr. {Murphy.} Thank you. Now recognize Mr. Long for 5  
1982 minutes.

1983           Mr. {Long.} Thank you, Mr. Chairman, and thank you all  
1984 for being here today and your patience so far. Mr. Klara,  
1985 has the Department of Energy estimated how many billions of  
1986 tons per year will need to be stored if the United States is  
1987 to sequester a substantial portion of coal-based carbon

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1988 dioxide?

1989 Mr. {Klara.} There are many estimates that are out

1990 there relative to what the future could be for CO2

1991 production.

1992 Mr. {Long.} Many estimates from the Department of

1993 Energy?

1994 Mr. {Klara.} We rely mainly on estimates from others.

1995 So for example the Intergovernmental Panel on Climate Change,

1996 the Electric Power Research Institute has looked at these.

1997 Mr. {Long.} Do you know a ballpark range on how many

1998 billions of tons they are talking about? Have you looked at

1999 any of that or not?

2000 Mr. {Klara.} Well, some of the estimates, and we could

2001 give you specifics for a record, question for the record.

2002 But some of the specifics would be looking at CCS having to

2003 handle potentially 20 percent or more of the reduction needed

2004 to get the CO2 stabilization. And yes, that could be in the

2005 range of, you know, a billion tons or more.

2006 Mr. {Long.} Billion or multiple billions?

2007 Mr. {Klara.} I would have to go back and look.

2008 Mr. {Long.} Okay, if you wouldn't mind if you could get



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According to the U.S. Energy Information Administration's (EIA) 2014 Annual Energy Outlook, the 307-gigawatt (GW) fleet of existing U.S. coal-fueled power plants emitted 1,514 million metric tons (MT) of carbon dioxide (CO<sub>2</sub>) while generating 1,499 billion kilowatt-hours of electricity in 2012. This corresponds to an average coal fleet CO<sub>2</sub> emission rate of 2,222 lbs/MWh. If CO<sub>2</sub> were captured from the existing fleet of coal-fueled power plants, the total CO<sub>2</sub> storage requirements would depend on how much of the fleet was controlled for CO<sub>2</sub>, the capacity factor for each plant, and the percentage of CO<sub>2</sub> captured from each plant. A CO<sub>2</sub> capture rate of approximately 40% would be required to achieve a CO<sub>2</sub> emissions rate of 1,100 pounds per gross megawatt-hour. A 90% CO<sub>2</sub> capture rate is the nominal goal of the U.S. Department of Energy's Clean Coal Research Program.

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2051           Mr. {Friedmann.} One of the reasons why we do  
2052 everything we do is that the future is opaque, and it is  
2053 important to prepare as many options for the market as  
2054 possible.

2055           Mr. {Long.} That is why I think that the private sector  
2056 should be involved in more of this than the government, but I  
2057 will stick with you, Dr. Friedmann. Does the Department of  
2058 Energy intend to intervene to make siting pipelines for  
2059 distant carbon injection a more realistic option? I  
2060 understand this has been a barrier to some utilities who want  
2061 to pursue CCS projects.

2062           Mr. {Friedmann.} What I can say is that we have--so for  
2063 any project that we have been involved in, we have supported  
2064 the development and deployment of those pipelines. Where we  
2065 see opportunities for regional networks to emerge that would  
2066 help anchor CCS industries and large coal projects, we are  
2067 keenly committed to seeing those pipelines come forward. One  
2068 example of this is actually the support we have given to the  
2069 FutureGen project in the FutureGen Alliance and their efforts  
2070 to build a pipeline within Illinois.

2071           Mr. {Long.} Okay, and, Mr. Chairman, I yield back and

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2072 thank you all again for my time.

2073 Mr. {Friedmann.} Mr. Chairman, if I can clarify  
2074 something for the record.

2075 Mr. {Murphy.} Yes.

2076 Mr. {Friedmann.} Thank you. This actually had to do  
2077 with respect to Representative Ellmers' questions. She was  
2078 asking about the price of capture. The answers which I gave  
2079 were for a high fraction of capture, basically 90 or 95  
2080 percent capture. At small fractions of capture, say 50  
2081 percent capture, the actual integrated cost is much less.  
2082 And that is relevant with respect to how you can deploy  
2083 either modular units or smaller fractions of capture on the  
2084 new or existing fleets.

2085 Mr. {Murphy.} Is that a reference to a question about  
2086 the 40 percent increase in costs?

2087 Mr. {Friedmann.} Yes, exactly.

2088 Mr. {Murphy.} Do you have the information, or can you  
2089 provide it for this committee in addition to her question  
2090 about what this breaks down to in a cost-per-megawatt  
2091 generation and what this would then cost the average family?  
2092 Do you have that information now, or is that something you

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2093 can get to us?

2094 Mr. {Friedmann.} We prefer to bring that to you as a  
2095 question for the record and give it back to the committee  
2096 later. We have many of those kinds of calculations. Again  
2097 it is the excellent work of National Energy Technology and  
2098 their assessment team have done that for a wide range of  
2099 power plants, a wide range of technologies, and a wide range  
2100 of fuel prices. We are--be happy to provide that to the  
2101 committee.

2102 Mr. {Murphy.} That would help the committee and the  
2103 families who are trying to pay attention to this and see what  
2104 this means.

2105 Mr. {Friedmann.} Of course.

2106 Mr. {Murphy.} I now recognize Mr. Gardner for 5  
2107 minutes.

2108 Mr. {Gardner.} Thank you, Mr. Chairman, and I thank the  
2109 witnesses for joining us today. Mr. Klara, is it correct  
2110 that successful development and deployment of second  
2111 generation technologies are aware the Department of Energy  
2112 expects the cost savings that may help make CCS for coal  
2113 power competitive in the marketplace?

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The cost to the average family varies greatly due to regional variations in electric generation and market structure. Additionally, the type of generation technology and future status will also influence the cost. As such, it is not really possible to undertake this analysis well. DOE has not determined nor is it aware of an assessment which determines the cost for the average family of deploying carbon capture technologies under a specific greenhouse stabilization scenario.

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2114           Mr. {Klara.} I mentioned earlier, but we have three  
2115 buckets of technologies that we are going after. First  
2116 generation, which is the technologies deployed now. Second  
2117 generation is what you are referencing, and then we have  
2118 transformational technologies. And with second generation  
2119 technologies, we are headed toward a reduction in cost as  
2120 indicated by your remark.

2121           Mr. {Gardner.} And what is NETL's assessment of the  
2122 readiness of the technologies most critical to driving down  
2123 costs?

2124           Mr. {Klara.} Certainly when it comes to carbon capture  
2125 and storage, capture is by far the key element to drive the  
2126 cost down, and that is the majority of the focus of our  
2127 research program.

2128           Mr. {Gardner.} Have any of these second generation  
2129 technologies have been taken to the demonstration phase to  
2130 validate they work at commercial scale in a coal-fired power  
2131 plant?

2132           Mr. {Klara.} Not at this time, second--

2133           Mr. {Gardner.} Not at this time?

2134           Mr. {Klara.} Yeah, so demonstration of those would be

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2135 part of your planning.

2136 Mr. {Gardner.} Dr. Friedmann, about how much of DOE's  
2137 \$7.6 billion over the past decade has been dedicated towards  
2138 the second generation technologies?

2139 Mr. {Friedmann.} The overwhelming majority of the \$7.6  
2140 billion that we have dedicated so far is actually to the  
2141 large-scale commercial demonstrations. So but in that  
2142 context, to generate and develop the second demonstration  
2143 technologies, as you said, we have put already several  
2144 hundred millions of dollars into that research effort.

2145 Mr. {Gardner.} Okay, and the information that I have  
2146 says that we spent around \$3 billion towards the second  
2147 generation technologies. Would that be correct, of the \$7.6  
2148 billion?

2149 Mr. {Friedmann.} No, I don't think that is correct  
2150 actually.

2151 Mr. {Gardner.} Okay, maybe we can get--

2152 Mr. {Friedmann.} We would be happy to clarify that.  
2153 Yes, sir.

2154 Mr. {Gardner.} When do you expect demonstrations of  
2155 these second generation technologies will be completed?

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Over the past decade, the total investment in first generation CCS technologies has been \$4.45 billion in first generation technologies and \$3.15 billion for second generation and transformational technologies.



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2198 cut in half. We expect them to come in at something like \$40  
2199 to \$60 a ton for an integrated system.

2200 Mr. {Gardner.} And you are also working what you call  
2201 transformational technologies. What would be the cost  
2202 savings of these expected transformational technologies?

2203 Mr. {Friedmann.} Again on a thermodynamic and an  
2204 engineering basis, they can get maybe another \$10, another  
2205 \$15 a ton cheaper. So something on the order of \$30 a ton is  
2206 probably about the limit of what you can reasonably expect.

2207 Mr. {Gardner.} And so when do you expect the  
2208 demonstrations of those transformation technologies to be  
2209 completed?

2210 Mr. {Friedmann.} Again we have laid out our road map,  
2211 and we are hoping to see those deployed in the field by 2025.

2212 Mr. {Gardner.} Okay, deployed in the field  
2213 commercially?

2214 Mr. {Friedmann.} Yeah.

2215 Mr. {Gardner.} Okay, at what price of CO2 capture per  
2216 ton or percentage of capture will the cost be low enough to  
2217 put a system on a level playing field economically with  
2218 traditional coal-fueled electrical power production?

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2219           Mr. {Friedmann.} I honestly don't understand your  
2220 question.

2221           Mr. {Gardner.} So basically at what, the price point,  
2222 the break point of CO2 capture per ton or percentage of  
2223 capture will the cost be low enough? Basically when will  
2224 this be economic, low enough to put a system on a level  
2225 playing field economically with traditional coal-fueled  
2226 electrical power production?

2227           Mr. {Friedmann.} It is my contention that the second  
2228 generation technologies are going to be the clean energy  
2229 choice in terms of a competitive market in a variety of  
2230 markets. In some markets, they won't be. In some markets,  
2231 they will be. And the transformational technology would just  
2232 increase the market share at that time.

2233           Mr. {Gardner.} But in terms of the cost, you know,  
2234 putting it on a level playing field from where we are today  
2235 with costs from where you want to be with these new  
2236 technologies cost. Do you have estimates? Have you produced  
2237 estimates and that will produce estimates of when this break  
2238 point will be?

2239           Mr. {Friedmann.} Again all environmental technologies

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2240 add cost. So it is not appropriate nor do we for the purpose  
2241 of policy decision compare the cost of carbon capture and  
2242 storage with an unretrofitted plant or with a new build plant  
2243 without it. We do that to demonstrate the delta, but a clean  
2244 plant is not comparable to a Dickensian plant. They are  
2245 different things.

2246 Mr. {Gardner.} Okay, if you could supply any cost  
2247 estimates that you have made, comparisons to the committee,  
2248 that would be fantastic. And have any of your estimates  
2249 changed in light of current market conditions?

2250 Mr. {Friedmann.} First of all, we are happy to provide  
2251 those numbers. The market conditions are constantly  
2252 changing. We actually try to bring that uncertainty into the  
2253 way that we make our price calculations in terms of  
2254 availability for labor, availability for materials, global  
2255 markets for things, and so forth. In that context, as the  
2256 market has changed, our estimates don't change as much as you  
2257 might guess. Some of that information is baked into the way  
2258 we do the calculations.

2259 Mr. {Gardner.} Thank you. And thank you, Mr. Chairman,  
2260 for being generous of time.

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In the current market, capturing CO<sub>2</sub> from an existing coal-fueled power plant will increase its cost of generating electricity relative to a traditional coal-fueled power plant, but offsetting revenues can be obtained by selling the captured CO<sub>2</sub> for a beneficial use such as enhanced oil recovery. If the Clean Coal Research Program R&D goals are achieved, coal-fueled power plants which utilize second generation CO<sub>2</sub> capture technology are projected to be competitive with other electricity generating sources, but will be dependent upon future market conditions and status of technology development of these other fuel sources and generating technologies.

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2282 that if I may.

2283 Ms. {Schakowsky.} Okay.

2284 Mr. {Friedmann.} Again thank you for the question and

2285 for your compliment. It was very nice of you to say so.

2286 Shell Oil Company has announced that they use a \$50-a-ton

2287 estimate for carbon dioxide for any project that they put

2288 together. Other companies; most Fortune 500 companies have a

2289 similar kind of number which they keep in terms of how they

2290 assist risk in a carbon-constrained future.

2291 We do not actually use those numbers to estimate cost of

2292 capture. Those are straight-up technical calculations based

2293 on the facility, the technology, the rank of coal, et cetera.

2294 What we do is we think about deployment in the context of

2295 those costs. Cost of carbon is something which is actually

2296 outside of what the Department of Energy does, but we do

2297 believe that we are in a carbon-constrained world and that

2298 increasingly the cost of carbon dioxide emissions will be

2299 internalized into the cost of doing business.

2300 As that happens, it is our privilege and our pleasure

2301 and my passion to find ways to drop the cost so that that

2302 deployment of clean energy technology can be as widely

**This is a preliminary, unedited transcript. The statements within may be inaccurate, incomplete, or misattributed to the speaker. A link to the final, official transcript will be posted on the Committee's website as soon as it is available.**

2303 successful as possible to create the brightest possible clean  
2304 energy future for the United States.

2305 Ms. {Schakowsky.} Perfect ending as far as I am  
2306 concerned. Thank you.

2307 Mr. {Murphy.} Thank you, and I have a clarifying  
2308 question here too with it. So you mentioned about Kemper.  
2309 They have that advantage of being able to use enhanced oil  
2310 recovery from their plant. Different coal plants around the  
2311 nation may not have that same advantage. And as you were  
2312 preparing information for us, would you let us know what you  
2313 believe the costs are for new plants or retrofitting old  
2314 plants?

2315 Mr. {Friedmann.} Um-hum.

2316 Mr. {Murphy.} Give us some comparisons and having that  
2317 public because we would like the companies themselves to be  
2318 able to respond to those estimates if you would be able to  
2319 get that for us.

2320 Mr. {Friedmann.} Yeah, we would be happy to.

2321 Mr. {Murphy.} Thank you.

2322 Mr. {Friedmann.} Let me add that the availability of  
2323 EOR doesn't affect the cost of the project. It affects the

COMMITTEE: HOUSE ENERGY AND COMMERCE,  
SUBCOMMITTEE ON OVERSIGHT AND  
INVESTIGATIONS

HEARING DATE: FEBRUARY 11, 2014

WITNESS: JULIO FRIEDMANN  
PAGE: 115, LINE: 2307-2320

INSERT FOR THE RECORD

In the current market, capturing CO<sub>2</sub> from an existing coal-fueled power plant will increase its cost of generating electricity relative to a traditional coal-fueled power plant, but offsetting revenues can be obtained by selling the captured CO<sub>2</sub> for a beneficial use such as enhanced oil recovery. If the Clean Coal Research Program R&D goals are achieved, coal-fueled power plants which utilize second generation CO<sub>2</sub> capture technology are projected to be competitive with other electricity generating sources, but will be dependent upon future market conditions and status of technology development of these other fuel sources and generating technologies.



**Department of Energy**  
Washington, DC 20585

May 27, 2014

The Honorable Brian Schatz  
Chairman  
Subcommittee on Water and Power  
Committee on Energy and Natural Resources  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

On February 27, 2014, Mike Carr, Senior Advisor to the Director, Energy Policy and Systems Analysis and, Principal Deputy Assistant Secretary, Office of Energy Efficiency and Renewable Energy, testified regarding S. 1419, the Marine and Hydrokinetic Renewable Energy Act of 2013.

Enclosed are the answers to six questions submitted by Ranking Member Mike Lee, Senators Ron Wyden, Lisa Murkowski, and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis", is positioned above the typed name.

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Mike Lee, Ranking Member





## QUESTION FROM CHAIRMAN SCHATZ

- Q1. Mr. Carr, discussion surrounding the recent expiration of the production tax credit has mostly focused on the effect of the expiration on the wind industry. We often forget that marine and hydrokinetic renewable energy projects were also eligible for the PTC. Recognizing that MHK is largely in a pre-commercial phase, I wonder if you have thoughts on how the presence or absence of this tax credit will affect the economics of getting these projects built. In other words, how important is the PTC to marine and hydrokinetic renewable projects?**
- A1. The President's FY 2015 Budget Request supports making permanent and expanding the Production Tax Credit in order to provide a strong, consistent incentive to encourage investment in a variety of renewable energy technologies. As the nascent MHK industry grows in the short-term, production incentives such as the PTC could drive continued growth in the industry. MHK receives 1.1 cents per kilowatt hour through the PTC; certain other renewables such as wind and geothermal receive 2.3 cents per kilowatt hour. DOE currently estimates the cost of MHK technology at 60 cents per kilowatt hour. Our primary focus is continuing robust R&D, which is the most important aspect of driving MHK technology down the cost curve to make it more competitive in localized electricity markets.**

## QUESTION FROM CHAIRMAN SCHATZ

- Q2. Mr. Carr, why is DOE's R&D budget for MHK so small? Given its potential mid to long term, why does it get a small fraction of the amount of DOE funding other renewables receive?**
- A2. EERE is taking MHK research, development and demonstration seriously, and does believe it has an important role in the Administration's "all of the above" energy strategy moving forward. Given the relatively low technical maturity of devices and the nascent state of the industry, significant technological research and development is necessary to drive MHK down the cost curve towards competitiveness with localized electricity markets. As DOE currently estimates the cost of MHK to be \$.60/kWh, the technology is more than 4 times more expensive than where it needs to be to be competitive. This makes MHK R&D a longer-term technology.**

**In FY 2015, the Department's Budget Request reflects a more equitable split across MHK and hydropower. The \$30.5 million requested in FY 2015 for MHK allows the Water Power Program to continue its ongoing efforts to advance water power technologies and accelerate their market adoption. For example, the FY 2015 Request supports continued MHK applied research and development and testing of innovative component technologies designed specifically for the challenges of the marine environment, and testing and research to address key environmental uncertainties that arise within the rapidly developing industry, among other activities. In summary, the Department's Budget Request provides the priority and funding stability necessary to continue making progress in marine and hydrokinetic technologies.**

## QUESTION FROM SENATOR WYDEN

**Q3.** I am disappointed, but not surprised that the Department's testimony has no official position on the legislation. The same was true with regard to Dr. Danielson's testimony on our critical minerals legislation. So let me ask you the question this way -- do you agree that the folks at OSU and the University of Washington and their colleagues around the country are making progress on what could be a very promising set of renewable energy technologies and that they ought to be encouraged to continue?

**A3.** DOE's National Marine Renewable Energy Centers are expected to play a role in technology advancement in the future, and prior DOE investments in their capabilities have positioned the centers to compete for DOE funding opportunity announcements. For example, the Northwest National Marine Renewable Energy Center (NNMREC) just last year was selected to negotiate for an award of \$750,000 through a new competitive DOE Funding Opportunity Announcement (FOA). Additionally, the NNMREC and other centers are expected to remain competitive for future DOE FOAs, such as the 3-year, \$4 million Marine and Hydrokinetic (MHK) Research and Development University Consortium FOA (announced on April 10, 2014), which aims to leverage field R&D expertise to advance U.S. MHK technology, while developing intellectual capital for a globally-competitive workforce.

To date, OSU, the University of Washington, and their colleagues have contributed to MHK technology advancement by optimizing MHK system and component designs, demonstrating and evaluating technology innovations, developing testing instrumentation, and reducing siting risks by reducing resource characterization uncertainty and informing improved regulatory processes.

Continued university research, development, demonstration, and testing—such as those activities that have been performed at or in conjunction with the NMRECs—are clearly important to DOE's

mission of developing cost-competitive MHK technologies. The Department believes the work at OSU and the University of Washington (like scaled wave energy converter device testing in both laboratory and intermediate sites, and other R&D activities) has advanced this mission and has played a valuable role in advancing the nascent U.S. MHK industry.

## **QUESTION FROM SENATOR WYDEN**

**Q4. Over the past decade, through both Democratic and Republican Administrations, congressional authorizing and appropriations committees have worked to maintain a Federal commitment to both conventional and wave energy technologies. As I discussed with Assistant Secretary Danielson a couple of weeks ago when he appeared before the Committee, Congress appropriated funds for wave energy in the FY2014 Omnibus Appropriations Act, but the Department has not been following through to ensure that those funds make their way to the U.S. research community. Can you assure us that those funds are, in fact, going to be making it to our research centers?**

**A4. The Department thanks the Senator and the Committee for their strong leadership and support of MHK research, development, testing, and demonstration.**

**DOE can assure Congress that several competitive funding opportunities will be announced so that the funding will be moved out to the research community, which includes universities.**

## QUESTION FROM SENATOR MURKOWSKI

- Q5. Since 2005 Congress has been on record supporting research and development of MHK technology. We have appropriated a bit more than \$200 million in the past decade on MHK development, but the United Kingdom has spent three and one-half times more, and the European nations collectively have spent five times more than America on marine technology. The recent omnibus appropriations bill for FY14 allotted \$41.3 million for MHK funding but contained report language directing that no funding is to be made available for the deep-tank wave testing facility. Does the Department support such a restriction? Aren't we in danger of wasting the money we've already spent for the Oregon marine center if we discontinue this aid? How much will it cost DOE if we move to replicate the research and device verification facilities that have already been built at the Oregon facility at some new academic center or even at the national labs?**
- A5. To date, the Department of Energy has not funded any deep-tank wave testing facility. Following Congressional intent in the explanatory statement accompanying the FY 2014 Omnibus Appropriations Act, the Department will not provide funding support for a deep tank test facility in FY2014. Funding for a deep-tank wave testing facility is also not requested in the FY15 budget. The Department will not replicate any existing research and device verification facilities, including any facilities that might exist at DOE NMRECs.**

## QUESTION FROM RANKING MEMBER LEE

**Q6.** The National Research Council (NRC) of the National Academy of Sciences released a report last May prepared at DOE's request that contains conclusions on the limited application of MHK resources. [See excerpts pasted below along with a link to the entire study.] Please comment on this report's conclusions and how they square with the continued federal funding and support for MHK technology, which is further expanded in S. 1419.

**A6.** With 50% of the U.S. population living within 50 miles of coastlines, there is significant potential to provide clean, renewable electricity to coastal communities and cities using MHK technologies. Based on the various resource assessments reviewed in the NRC report that were sponsored by the U.S. Department of Energy, the technical resource potential for United States-wave, tidal, current, and riverine hydrokinetic resources is estimated to be between 1,300 and 1,800 TWh/year, which would be more than one-fourth of U.S. electricity consumption if fully captured. While the NRC report noted that there were several areas where improvements could be made across the assessments, it did not dispute the overall magnitude of the technical resource potential across the country.

Technical resource potential is the portion of a theoretical resource that can be captured using a specific technology (usually the current state-of-the-art). Practical resource potential is the portion of the technical resource that is available when other constraints—such as economic, environmental, and regulatory considerations—are factored in. The NRC report did note that additional analysis is needed if an accurate evaluation of the practical resource potential at specific sites is desired.

The NRC report also noted that DOE should improve public access to results and data generation through the resource assessments for the purposes of allowing other groups to

continue analyses of practical resource potential. To that end, the Department has published all the MHK resource assessment reports and maps online at <http://energy.gov/eere/water/marine-and-hydrokinetic-resource-assessment-and-characterization> and is centralizing information from all of the assessments in the Geospatial Renewable Energy Atlas at the National Renewable Energy Laboratory.





**Department of Energy**  
Washington, DC 20585

June 5, 2014

The Honorable John Shimkus  
Chairman  
Subcommittee on Environment and the Economy  
Committee on Energy and Commerce  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On September 10, 2013, Dr. Peter Lyons, Assistant Secretary for Nuclear Energy, testified regarding "Implementing the Nuclear Waste Policy Act – Next Steps".

Enclosed are the answers to 10 questions that were submitted by Representatives Bob Latta, Bill Johnson, John Dingell and you. Also enclosed are two Inserts that were requested by Representatives John Dingell and Tim Murphy to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher E. Davis".

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Paul Tonko, Ranking Member



## QUESTION FROM CHAIRMAN JOHN SHIMKUS

**Q1. In terms of DOE's activities on spent nuclear fuel and high-level waste disposal, please indicate which activities receive higher priority and leadership focus:**

- a. Following the Nuclear Waste Policy Act, complying with the August 13, 2013 Writ of Mandamus by the D.C. Circuit Court, and defending the Yucca Mountain license application; or**
- b. DOE's Strategy for the Management and Disposal of Used Nuclear Fuel and High-level Radioactive Waste which has not been authorized by Congress.**

**A1. The Department is committed to meeting its obligations to dispose of used nuclear fuel and high-level radioactive waste. All DOE activities regarding the management and disposal of used nuclear fuel and high-level radioactive waste are important and receive the Department's focused attention. As the Department has consistently stated, it will comply fully with the law and will evaluate and determine how to respond to applicable orders from the courts or the NRC. In addition, as previously conveyed to the Subcommittee, we are conducting activities within existing Congressional authorization to plan for the eventual transportation, storage and disposal of spent nuclear fuel and high-level waste. These activities are intended to facilitate the development of an interim storage facility, of a geologic repository and of the supporting transportation infrastructure. These activities are designed to not limit the options of either the Administration or the Congress.**

**The Administration released its *Strategy for the Management and Disposal of Used Nuclear Fuel and High Level Waste* in January 2013. The Strategy provides the framework for sustainable management and disposal of used nuclear fuel and high-level waste that is founded on consent-based siting, interim storage, geologic disposal, a new entity to manage the program, and**

**sustainable funding mechanisms. The Administration looks forward to working with Congress to build and implement the principles and elements of this Strategy.**

## QUESTION FROM CHAIRMAN JOHN SHIMKUS

**Q2.** Your response to my letter of August 26, 2013, letter listed several active contracts. Please provide a list of the expiration dates for those contracts, whether DOE intends to allow those contracts to expire, and any actions DOE intends to take to extend contracts and preserve DOE's access to those services and expertise.

**A2:**

Contract	Expiration Date	Planned Actions
USA REPOSITORY SERVICES LLC	March 31, 2014	<ul style="list-style-type: none"> <li>Depending on actions to be undertaken by DOE in response to NRC requests or orders, this contract could be extended, in accordance with applicable law.</li> </ul>
SANDIA CORPORATION	March 31, 2014	<ul style="list-style-type: none"> <li>DOE will use the Sandia National Laboratories capabilities through the NNSA contract for that site. DOE will continue to utilize the services of the lab as necessary to support DOE's response to NRC requests or orders.</li> </ul>
HUNTON AND WILLIAMS	December 31, 2013	<ul style="list-style-type: none"> <li>Depending on actions to be undertaken by DOE in response to NRC requests or orders, this contract for legal services could be extended, in accordance with applicable law.</li> </ul>
BOOZ ALLEN HAMILTON INC.	November 30, 2014	<ul style="list-style-type: none"> <li>This contract for preparation of the Nuclear Waste Fee Adequacy Assessment could be extended in accordance with applicable law.</li> </ul>
BROOKFIELD RELOCATION INC.(Travel/PCS)	September 30, 2015	<ul style="list-style-type: none"> <li>This contract to reimburse employees for travel and permanent change of station expenses associated with the closure of the Office of Civilian Radioactive Waste Management could be extended in accordance with applicable law.</li> </ul>
OFFICES, BOARDS & DIVISIONS (Fed Prison Ind., Inc.)	November 2015	<ul style="list-style-type: none"> <li>This contract to disposition property associated with the closure of the Office of Civilian Radioactive Waste Management could be extended in accordance with applicable law.</li> </ul>
GEOLOGICAL SURVEY, UNITED STATES DEPT OF INTERIOR	N/A	<ul style="list-style-type: none"> <li>Interagency Agreement with USGS.</li> </ul>
MORGAN, LEWIS & BOCKIUS LLP	December 31, 2016	<ul style="list-style-type: none"> <li>Depending on actions to be undertaken by DOE in response to NRC requests or orders, this contract for legal services could be extended, in accordance with applicable law.</li> </ul>
KPMG L.L.P.	September 2014	<ul style="list-style-type: none"> <li>Auditing services for the Nuclear Waste Fund.</li> </ul>

The Department's response to the referenced August 26, 2013 letter included a contract with Jason Associates Corporation as an active contract. In fact, that contract was not active at that time.

**QUESTION FROM CHAIRMAN JOHN SHIMKUS**

- Q3. Is DOE preparing to assemble a team of personnel and contractor support necessary to defend the license application? If not, why not? If so, please describe the actions underway.**
- A3. On August 30, 2013, the Nuclear Regulatory Commission (NRC) issued an order requesting input from the parties to the licensing proceeding as to how the NRC should continue with the licensing process in light of the writ of mandamus from the U.S. Court of Appeals for the D.C. Circuit ordering the NRC to resume its review of the Yucca Mountain license application. As the Department has consistently stated, it will comply with the law and will evaluate and determine how to respond to applicable orders from the courts or the NRC.**

**QUESTION FROM CHAIRMAN JOHN SHIMKUS**

- Q4. When will DOE provide the Committee a detailed estimate of the resources necessary for DOE to resume its program to support completion of the license review?**
- A4. As the Department has consistently stated, it will comply with the law and will evaluate and determine how to respond to applicable orders from the courts or the NRC.**

**In FY 2010, the last year in which Congress appropriated funds for a repository at Yucca Mountain, the Administration's budget request for the Office of Civilian Radioactive Waste Management was \$196,800,000.**

**QUESTION FROM CHAIRMAN JOHN SHIMKUS**

**Q5. What was the basis for DOE's conclusion that the NWPA funds could be used to shut down the licensing process?**

**A5. The principles underlying the Department's use of NWPA funds in connection with the orderly closure of the Yucca Mountain Project were addressed in an April 12, 2010 letter from Scott Blake Harris, General Counsel of the Department of Energy, to the Honorable Rodney P. Frelinghuysen, Ranking Member of the Subcommittee on Energy and Water Development, Committee on Appropriations, U.S. House of Representatives. A copy of that letter is enclosed. As stated in that letter, the Subcommittee was apprised of the Department's exercise of authority to reprogram funds for use in the orderly closure of the Yucca Mountain Project, the funds were used consistently with the purpose for which they were appropriated, and the Department's actions with respect to the discontinuation of OCRWM operations and reprogramming of appropriated funds were within its proper authority.**

**QUESTION FROM CHAIRMAN JOHN SHIMKUS**

- Q6. Has DOE examined whether the use of Nuclear Waste Fund money to close down the Yucca Mountain program was a violation of the Purpose Act? If so, please provide a legal memo outlining DOE's conclusions.**
- A6. The reprogrammed funds appropriated from the Nuclear Waste Fund that were used for the orderly closure of the Yucca Mountain Project were used consistently with the purpose for which they were appropriated as more fully explained in the enclosed April 12, 2010 letter.**



**QUESTION FROM CHAIRMAN JOHN SHIMKUS**

- Q7. Is DOE examining options for restoring or reimbursing the Nuclear Waste Fund money that was misspent on terminating the Yucca Mountain program? If so, please provide us a legal memo outlining DOE's conclusions.**
- A7. As more fully explained in the enclosed April 12, 2010 letter, the funding used for the orderly closure of the Yucca Mountain Project was used consistently with the purpose for which they were appropriated. The appropriate Subcommittee was timely apprised of the basis for DOE's actions addressing the reprogramming of appropriated funds for the orderly closure of the Yucca Mountain Project.**

**QUESTION FROM REPRESENTATIVE BOB LATTA**

**Q1. Please explain the basis for your refusal to commit that DOE will neither attempt to slow or obstruct the resumption or pace of the license review.**

**A1. As we have consistently said, the Department will comply with the law and evaluate and determine how to respond to orders by the courts or the NRC.. The Department does not intend to slow or obstruct any aspect of the process.**

**QUESTION FROM REPRESENTATIVE BILL JOHNSON**

**A1. Will DOE, as the applicant in the Yucca Mountain license proceeding, once again advocate in favor of NRC granting construction authorization?**

**As the Department has consistently stated, it will comply with the law and evaluate and determine how to respond to orders by the courts or the NRC.**

**QUESTION FROM REPRESENTATIVE JOHN DINGELL**

**Q1. A D.C. Circuit Court decision in 2012 ordered DOE to reevaluate the fee assessment. Since the Yucca Mountain facility has not moved forward in recent years and there is statutorily no alternative site for a permanent high-level waste repository, has DOE considered whether it should continue to assess the fee?**

**A1. The Department of Energy's *Nuclear Waste Fund Fee Adequacy Assessment Report*, published and submitted to the U.S. Court of Appeals for the D.C. Circuit in January 2013, supports the need for continued collection of the fee. The obligation to take possession and dispose of used nuclear fuel from commercial contract holders remains, and the fees collected and interest earned are intended to offset the costs of performing our statutory and contractual obligations. As the Department has consistently stated, it will comply with the law and evaluate and determine how to respond to orders by the courts.**

953 complete the work on the reports? Would you please answer  
954 yes or no?

955 Ms. {Macfarlane.} As referenced earlier in previous  
956 testimony, we said that it would cost to 6.5 million to  
957 complete the SER--

958 Mr. {Dingell.} So the answer is--

959 Ms. {Macfarlane.} --but we have asked our staff to  
960 update that number.

961 Mr. {Dingell.} Would you submit us a statement of the  
962 status of those funds, please?

963 Now, Mr. Lyons, is DOE collecting fees into the Nuclear  
964 Waste Fund? Yes or no?

965 Mr. {Lyons.} Yes, the funds continue to be--

966 Mr. {Dingell.} Thank you. The D.C. Circuit Court  
967 decision in 2012 ordered DOE to reevaluate the fee  
968 assessment. Since Yucca Mountain facility has not moved  
969 forward in recent years and there is still no statutorily  
970 alternative site for a permanent high-level waste repository,  
971 has DOE considered whether it should continue to assess the  
972 fee? Please answer yes or no.

973 Mr. {Lyons.} Mr. Dingell, as Secretary Moniz discussed  
974 when he was with this subcommittee, the fees continue to be  
975 collected because they--

976 Mr. {Dingell.} So--

977           Mr. {Lyons.} --reference a service of disposal of the  
978 used fuel.

979           Mr. {Dingell.} Is that a yes or no, sir? My time is  
980 very limited. Please, yes or no? To the question, yes or  
981 no?

982           Mr. {Lyons.} Again, these--

983           Mr. {Dingell.} Okay. Would you please submit  
984 additional information on that matter for purposes of the  
985 record?

986           Now, because the Federal Government has not upheld its  
987 responsibility to provide a permanent high-level nuclear  
988 waste repository, it is my understanding that orders of  
989 nuclear facilities are suing the Federal Government for  
990 compensation to store waste on sites and locations across the  
991 country. According to the February 2012 report by CRS, there  
992 has been over \$2 billion in awards and settlements as a  
993 result of these claims. These payments come from the  
994 judgment funded by taxpayers' dollars. The Department of  
995 Justice has spent approximately 200 million defending the  
996 government against these claims.

997           Now, Madam Chairman, I urge NRC to focus on the  
998 completion of the Safety Evaluation Reports. Should the  
999 reports determine that the Yucca Mountain facility is  
1000 appropriate, hopefully opponents will allow the process to

COMMITTEE: HOUSE ENERGY AND COMMERCE  
HEARING DATE: SEPTEMBER 10, 2013  
WITNESS: PETER LYONS  
PAGE: 49, LINE: 971 and PAGE 50, LINE: 983

INSERT FOR THE RECORD

The Department of Energy's *Nuclear Waste Fund Fee Adequacy Assessment Report*, published and submitted to the U.S. Court of Appeals for the D.C. Circuit in January 2013, supports the need for continued collection of the fee. The obligation to take possession and dispose of used nuclear fuel from commercial contract holders remains, and the fees collected and interest earned are intended to offset the costs of performing our statutory and contractual obligations. As the Department has consistently stated, it will comply with the law and evaluate and determine how to respond to orders by the courts.

1721 Resolution was the last time NRC and DOE received funding for  
1722 the license review. Am I correct on that, Ms. Macfarlane?

1723 Ms. {Macfarlane.} I am sorry, the fiscal year--

1724 Mr. {Murphy.} The fiscal year 2011 Continuing

1725 Resolution was the last time NRC and DOE received funding for  
1726 license review--

1727 Ms. {Macfarlane.} Yes.

1728 Mr. {Murphy.} --am I correct, Mr. Lyons, is that true  
1729 as well?

1730 Ms. {Macfarlane.} I do believe that is correct.

1731 Mr. {Murphy.} And the purpose of that funding was to  
1732 carry out the purposes of the Nuclear Waste Policy Act, am I  
1733 correct?

1734 Ms. {Macfarlane.} Sorry?

1735 Mr. {Murphy.} The purpose of that funding was to carry  
1736 out the purposes of the Nuclear Waste Policy Act?

1737 Ms. {Macfarlane.} Yes.

1738 Mr. {Murphy.} Am I correct?

1739 Ms. {Macfarlane.} Certainly.

1740 Mr. {Murphy.} And, Dr. Lyons, but DOE used that money  
1741 for the opposite purpose, to shut down the Yucca Mountain  
1742 program in an attempt to withdraw the license application, am  
1743 I correct?

1744 Mr. {Lyons.} The fiscal year 2010 funding was used for



1745 shutdown of the program, yes.

1746 Mr. {Murphy.} All right. And, Dr. Macfarlane, the NRC  
1747 also used that money to suspend the license review, correct?

1748 Ms. {Macfarlane.} Correct.

1749 Mr. {Murphy.} And, Dr. Lyons, how much money from the  
1750 Nuclear Waste Fund did DOE spend to shut down the program?

1751 Mr. {Lyons.} I would prefer to give you a precise  
1752 number. It was around 130 million but we can give it to you  
1753 precisely in writing.

1754 Mr. {Murphy.} I have 138 million. I just wanted to be  
1755 sure but let me know the precise number.

1756 Chairman Macfarlane, how much money from the Nuclear  
1757 Waste Fund did NRC spend to suspend the license review?

1758 Ms. {Macfarlane.} I believe it was 7.4 million.

1759 Mr. {Murphy.} Okay. I thought it was a little bit  
1760 more. Could you double-check the number, please?

1761 Ms. {Macfarlane.} I can certainly double-check the  
1762 number.

1763 Mr. {Murphy.} So, to both of you, together your two  
1764 agencies have spent, by my calculations, a little bit under  
1765 \$150 million of electricity consumers' money shutting down a  
1766 license review that the court has now said you have to  
1767 complete. So electricity consumers throughout this country  
1768 paid for you to conduct the license review, not to scuttle

**COMMITTEE: HOUSE ENERGY AND COMMERCE**

**HEARING DATE: SEPTEMBER 10, 2013**

**WITNESS: PETER LYONS**  
**PAGE: 82, LINE: 1751**

**INSERT FOR THE RECORD**

**As of September 30, 2013, the Department has spent approximately \$163.1 million on the shutdown of the Yucca Mountain project and the closure of the Office of Civilian Radioactive Waste Management. Of this total, \$77.3 million were from the Nuclear Waste Fund with the remainder paid from appropriations for defense nuclear waste disposal activities.**



## Department of Energy

Washington, DC 20585

June 30, 2014

The Honorable Ed Whitfield  
Chairman  
Subcommittee on Energy and Power  
Committee on Energy and Commerce  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On March 25, 2014, Paula Gant, Deputy Assistant Secretary for Oil and Natural Gas, Office of Fossil Energy, testified regarding H.R. 6, the "Domestic Prosperity and Global Freedom Act."

Enclosed are the answers to five questions that were submitted by Representative Gene Green. Also enclosed is an Insert that you requested to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Christopher E. Davis", is positioned above the printed name.

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Bobby L. Rush, Ranking Member



## QUESTION FROM REPRESENTATIVE GENE GREEN

Dr. Gant, over the past few years, U.S. exports of LNG has been discussed at length.

Q1. Would you agree that there are geo-political benefits of exporting domestic natural gas?

A1. As of March, 2014, Yes. These benefits are included in the discussion of recent DOE long-term authorizations to export liquefied natural gas (LNG) to non-free trade agreement countries. For example, in the LNG export authorization to Jordan Cove Energy Project, L.P, (DOE/FE Order No. 3413, March 24, 2014), DOE stated in its findings:

*We have also considered the international consequences of our decision. We review applications to export LNG to non-FTA nations under section 3(a) of the NGA. The United States' commitment to free trade is one factor bearing on that review. An efficient, transparent international market for natural gas with diverse sources of supply provides both economic and strategic benefits to the United States and our allies. Indeed, increased production of domestic natural gas has significantly reduced the need for the United States to import LNG. In global trade, LNG shipments that would have been destined to U.S. markets have been redirected to Europe and Asia, improving energy security for many of our key trading partners. To the extent U.S. exports can diversify global LNG supplies, and increase the volumes of LNG available globally, it will improve energy security for many U.S. allies and trading partners. As such, authorizing U.S. exports may advance the public interest for reasons that are distinct from and additional to the economic benefits identified in the LNG Export Study.*

QUESTION FROM REPRESENTATIVE GENE GREEN

In fact, DOE states U.S. LNG exports will benefit our allies by diversifying supplies and increasing availability globally.

Q2. Would you agree that including U.S. LNG in global supplies would offer some certainty to our allies that they have access to a stable source?

A2. As of March, 2014, Yes. See also the response to Q1.

## QUESTION FROM REPRESENTATIVE GENE GREEN

DOE also states that our allies will have the flexibility when engaging with current suppliers to negotiate better terms and prices.

In DOE's Jordan Cove application, very little was written about the geo-politics of LNG and much was written defending the NERA study.

Q3. What role does the economics of an application or long-term contract destination play?

A3. As of March, 2014, the macroeconomic impact of an application to export LNG is one of many key factors considered by DOE in assessing whether a proposed export is consistent with the public interest. A conservative estimate of the macroeconomic impact of an application to export LNG was included in the 2012 NERA Economic Consulting Study, *Macroeconomic Impacts of LNG Exports from the United States*, prepared at the direction of DOE. In that study, NERA made conservative assumptions regarding the impact of LNG exports on the U.S. economy.

To date, applications have sought broad authority to export LNG to multiple countries, in many cases to any non-free trade agreement country not prohibited by U.S. law or policy.

In such cases, DOE cannot assess the direct impact of a specific country of destination, but instead focuses on the international benefits of LNG exports, as detailed in the response to

Q1. However, DOE does require LNG exporters to disclose to DOE the destination countries on an ongoing monthly basis.

QUESTION FROM REPRESENTATIVE GENE GREEN

Q4. Do you agree that U.S. LNG supplies offer medium-to-long term benefits?

A4. As stated in Q1: *An efficient, transparent international market for natural gas with diverse sources of supply provides both economic and strategic benefits to the United States and our allies. Indeed, increased production of domestic natural gas has significantly reduced the need for the United States to import LNG. In global trade, LNG shipments that would have been destined to U.S. markets have been redirected to Europe and Asia, improving energy security for many of our key trading partners. To the extent U.S. exports can diversify global LNG supplies, and increase the volumes of LNG available globally, it will improve energy security for many U.S. allies and trading partners.*

## QUESTION FROM REPRESENTATIVE GENE GREEN

In the short-term, U.S. leadership could provide certainty to our allies across the globe.

Q5. Are there short-term solutions that DOE has identified that would benefit our allies?

A5. We take the energy security of our allies very seriously. Most immediately, the U.S. government has been working with Ukraine and our allies on its western borders to encourage them to prepare to reverse natural gas flows in some of its pipelines. DOE and other agencies are also taking steps to provide technical assistance in the areas of safely developing hydrocarbon and renewable resources, energy efficiency and energy sector reform. We will also provide technical assistance to help Central and Eastern European countries develop contingency plans for this coming winter to ensure provision of essential service in the event of an energy disruption.



1182 security.

1183 Mr. {Gardner.} So that means what for the United  
1184 States, in terms of geopolitical situation?

1185 Ms. {Gant.} We are very keenly interested and invested  
1186 in the energy security of our allies and training partners.

1187 Mr. {Gardner.} So it would increase the security of our  
1188 allies?

1189 Ms. {Gant.} It is a key strategic interest to the  
1190 United States.

1191 Mr. {Gardner.} Okay. It would create American jobs?

1192 Ms. {Gant.} What is it? I am sorry, I have lost track  
1193 of what it--

1194 Mr. {Gardner.} We would create American jobs  
1195 developing--

1196 Ms. {Gant.} Increased production of natural gas has led  
1197 to, yes, increased economic benefits.

1198 Mr. {Gardner.} And that would be a net benefit to the  
1199 United States economy?

1200 Ms. {Gant.} In our analysis to date, yes.

1201 Mr. {Gardner.} I thank the witness for her time.

1202 Mr. {Whitfield.} I might make just one comment  
1203 regarding the scenario of exporting gas to Russia, or North  
1204 Korea, or wherever, and maybe Dr. Gant can answer this  
1205 question, or maybe you can't, but the reason we have these

1206 hearings is to find out. But Mr. Doyle presented a pretty  
1207 dire--and many of us would agree with you. We wouldn't want  
1208 gas going to Russia, North Korea, some of these WTO  
1209 countries.

1210 It is my understanding that the Energy Policy Act of  
1211 1975 gave the President of the United States the authority to  
1212 prohibit export of natural gas to any country if they deemed  
1213 it should not be done. And I know the Gardner bill does not  
1214 amend that Act, but do you know personally if what I have  
1215 just said is accurate?

1216 Ms. {Gant.} Mr. Chairman, if you wouldn't mind, I would  
1217 rather take that question for the record--

1218 Mr. {Whitfield.} Yeah.

1219 Ms. {Gant.} --because I believe I know the answer--

1220 Mr. {Whitfield.} Okay.

1221 Ms. {Gant.} --but I would rather--

1222 Mr. {Whitfield.} All right.

1223 Ms. {Gant.} --not--

1224 Mr. {Whitfield.} Well, if you wouldn't mind getting  
1225 back in touch with our committee staff? Because it is our  
1226 understanding that that is the case, that the President could  
1227 intervene and prevent some of the scenarios that Mr. Doyle  
1228 talked about. But we want to make sure that that is  
1229 accurate. Okay. That concludes the first panel, and we

COMMITTEE: HOUSE ENERGY AND COMMERCE,  
SUBCOMMITTEE ON ENERGY AND  
POWER

HEARING DATE: MARCH 25, 2014

WITNESS: PAULA GANT  
PAGE: 56, LINE: 1210-1229

INSERT FOR THE RECORD

Section 103(a) of the Energy Policy and Conservation Act of 1975 (EPCA), 42 USC 6212, states that the President may, by rule, under such terms and conditions as he determines appropriate and necessary to carry out the purposes of EPCA, restrict exports of natural gas. Section 2 of EPCA, 42 USC 6201, identifies the following purposes of the statute: (1) to fulfill obligations of the United States under the international energy program; (2) to provide for the creation of a Strategic Petroleum Reserve; (3) to conserve energy supplies through energy conservation programs, and, where necessary, the regulation of certain energy uses; (4) to provide for improved energy efficiency of motor vehicles, major appliances, and certain other consumer products; (5) to provide a means for verification of energy data to assure the reliability of energy data; and (6) to conserve water by improving the water efficiency of certain plumbing products and appliances. In order to exercise the authority granted by section 103(a), therefore, it would have to be shown that the restriction on gas exports is to further these purposes of EPCA. Please note also that the authority to implement section 103(a) of EPCA has been delegated pursuant to Executive Order 11912 to the Secretary of Commerce.



## Department of Energy

Washington, DC 20585

July 8, 2014

The Honorable Claire McCaskill  
Chairman  
Subcommittee on Financial and Contracting Oversight  
Committee on Homeland Security and  
Governmental Affairs  
United States Senate  
Washington, DC 20510

Dear Madam Chairman:

On March 11, 2014, William A. Eckroade, Principal Deputy Chief for Mission Support Operations, Office of Health, Safety and Security, and Matt Moury, Deputy Assistant Secretary, Safety, Security, and Quality Programs for Environmental Management, Office of Environmental Management, testified regarding "Whistleblower Retaliation at the Hanford Nuclear Site."

Enclosed are the answers to 18 questions that were submitted by Ranking Member Ron Johnson, and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, reading "Christopher E. Davis".

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Ron Johnson, Ranking Member



## **QUESTIONS FROM SENATOR CLAIRE MCCASKILL**

### **Whistleblower Retaliation at the Hanford Nuclear Site**

- Q1. At the hearing, Department of Energy (DOE) officials testified that it is up to the contracting officer to determine whether contractor costs of litigation and settlement with whistleblowers are wholly or partially allowable.**

**What are the criteria by which the contracting officer for the Waste Treatment Plant determines whether such costs are allowable?**

- A1. The Department has regulations at 10 CFR Part 719 that facilitate management of retained legal counsel and contractor legal costs, including litigation and legal matter costs that provide guidance to aid contractors and the Department in making determinations regarding the reasonableness of outside counsel costs, including the costs associated with litigation. DOE's regulations were developed in the 1990's and were updated in 2013. The regulations generally provide the ability to engage with the contractor regarding legal management in a forward-looking manner, instead of limiting reviews to backward-looking audits.**

**Contractor and retained legal counsel compliance with these regulations is a prerequisite for allowability of legal costs. However, compliance with the regulations does not guarantee that legal costs will be determined to be allowable. The contracting officer will separately determine whether costs are allowable in accordance with 48 CFR (FAR) part 31 and (DEAR) part 931 and all other applicable contract terms and conditions.**

**In terms of allowability, reasonable legal costs contractors incur related to whistleblower allegations may be allowable if, after the legal proceedings conclude, the allegations are not substantiated, and unallowable if, after the legal proceedings conclude, the allegations are substantiated. Costs may be partially allowed or disallowed for cases with mixed**

legal outcomes. When cases are settled before legal proceedings conclude, the contractor may be reimbursed if the settlement is in the best interests of the government. In situations where legal costs may be allowable, the Contracting Officer would determine allowability after consulting with legal counsel, on a case-by-case basis after considering the terms of the contract, relevant cost regulations, and the relevant facts and circumstances, including federal law and policy prohibiting reprisal against whistleblowers, available at the conclusion of the employee whistleblower action.

Federal regulations generally allow for provisional reimbursement of contractor legal expenses pending resolution of legal proceedings brought by third parties. DOE regulations give contracting officers the discretion to provisionally reimburse contractor legal costs related to whistleblower allegations pending resolution of the legal proceedings on a case-by-case basis. If a determination is later made that costs are unallowable, the contractor is obligated under the contract's terms to return the provisional reimbursements.

- 2Q. Does DOE reimburse contractors for costs associated with responding to congressional requests, including preparation for hearings?
- 2A. Yes, if the costs meet the Federal Acquisition Regulation (FAR) and/or the Department of Energy Acquisition Regulation (DEAR) in regards to allowability of costs.
- 3Q. What, if any, costs associated with preparation for this hearing have been reimbursed to Bechtel or URS?
- 3A. It is the Department's understanding that Bechtel has not at this time sought reimbursement related to preparation for the March 11 hearing. It is the Department's

understanding that URS will seek reimbursement for allowable costs. Reasonable and allowable costs associated with the preparation for this hearing will be reimbursed to Bechtel or URS through their respective general and administrative expense rates, which are paid based on forward-looking projections and then trued up after the end of each year. The salaries and travel of the individuals who participated in the hearings are normally included in the indirect costs that are charged to the government through the contractor's general and administrative expense rates. This cost appears to be allowable under FAR 31.205-22(b)(1), which addresses costs associated with providing a technical and factual presentation of information on a topic directly related to the performance of a contract through hearing testimony to Congress.

**Q4a.** How has DOE reviewed whether its contractors' employees whistleblower rights are not impacted by the signing of non-disclosure agreements or that these agreements do not prevent employees from raising safety or environmental issues to DOE, the Inspector General, Congress, or any other oversight agency?

**A4a.** DOE does not have a policy on what a contractor can or cannot include in a non-disclosure agreement (NDA) with its employees and has not surveyed contractor employees on this topic. However, contractors are contractually required to ensure that their employees can and do raise issues through specific avenues. Contractors are affirmatively required to ensure their employees notify appropriate authorities if they have any information about fraud, waste, abuse, mismanagement, safety and health violations, etc. (DOE Order 221.1A). They also must ensure that their employees do not suffer reprisal for disclosing information to the IG or other lawful appropriate entities (DOE Order 221.2A).

DOE also has policies and directives that provide contractor and subcontractor employees with avenues for reporting fraud, waste, abuse, and other concerns of mismanagement related to DOE programs, operations, facilities, and contracts. Employees can access multiple processes to raise claims of whistleblower retaliation including: the whistleblower protection provision of the Energy Reorganization Act; DOE regulations contained in 10 C.F.R. Part 708; and DOE's Inspector General for certain action prohibited under the Federal Acquisition Regulation. Contractor NDAs may not inhibit a contractor employee's ability to access these avenues and processes.

**Q4b.** Has DOE asked contractor employees whether they believe these NDAs allow them to raise safety issues?

**A4b.** DOE has not surveyed contractor employees on this topic and does not have a policy on what a contractor can or cannot include in a non-disclosure agreement (NDA) with its employees. However, contractors are required by law to protect employees who report violations of various workplace safety, commercial motor carrier, environmental, financial reform, and nuclear laws. Rights afforded by these whistleblower acts include, but are not limited to, worker participation in safety and health activities, reporting a work related injury, illness or fatality, or reporting a violation of the statutes. DOE contractors are required by federal law and DOE Orders to ensure that their employees can and do raise issues through specific avenues.

**Q5.** The 2013 National Defense Authorization Act included provisions aimed at protecting contractor and subcontractor employees from whistleblower retaliation. One of those provisions requires that agencies include these provisions in the contract.



**Q5a. Have these provisions been included in the Waste Treatment Plant and other contracts associated with Hanford?**

**A5a. The new law applies to new contracts, and permits the new provisions to be incorporated into existing contracts upon agreement by both parties. Although not required to do so, the U.S. Department of Energy Office of River Protection is preparing contract modifications to include the provisions implementing the new law into the WTP and other ORP contracts. Also, as noted in question 4a, DOE O 221.2A requires that contractors ensure that their employees do not suffer reprisal for disclosing information to the IG or other lawful appropriate entities.**

**Q5b. The law also requires that the head of the agency ensure that contractors and subcontractors inform their employees of their whistleblower rights and remedies in writing. Does DOE know whether Bechtel or URS are in compliance with this requirement?**

**A5b. As discussed above, the new law is only required to be applied to new contracts. As reflected above, DOE is in process of negotiating the provisions of the new law into the existing WTP and other ORP contracts. Only when the provisions of the new law are incorporated into the existing contracts would the requirement that the head of the agency ensure that contractors and subcontractors inform their employees of their whistleblowing rights and remedies in writing come into effect.**

**Q6. The Hanford Concerns Council investigates and seeks full, fair and final resolution of significant employee concerns that involve issues of health, safety or environmental protection, and has a significant track record of success. Although DOE provides a representative to the Council, neither Bechtel nor URS participate with respect to the Waste Treatment Plant.**

**Q6a. Does DOE support the participation of Bechtel and URS as Hanford Concerns Council members with respect to the Waste Treatment Plant?**

**A6a. The Department ensures that its contractors maintain robust programs that enable the timely resolution of safety, technical, and other issues raised by employees. The Department does not prescribe the use of this or other alternative processes in addition to existing programs.**

**Q6b. Has DOE encouraged Bechtel and URS to participate, and if so, how?**

**A6b. The Department supports measures taken by its contractors to strengthen issues resolution avenues for employees. It is the primary responsibility of the Department's contractors to determine if and how alternative or supplemental processes can augment their current programs.**

**Q7. Have the positions vacated by Donna Busche and Dr. Walt Tamosaitis been filled, and does DOE know by whom?**

**A7. The Department will continue to follow established procurement procedures to review and approve any individuals identified by Bechtel for Key Personnel positions under Bechtel's Waste Treatment Plant contract. The position held by Ms. Busche was a Key Personnel position. The contractor proposed and DOE approved Robert "R.T." Brock to fill the Key Personnel position of Manager of Nuclear Safety Engineering. Dr. Tamosaitis' position was not a Key Personnel position under the contract.**

**Q8. At the hearing, DOE stated that it had requested a consolidated list of safety issues raised by Ms. Busche and Dr. Tamosaitis from the contractor, and that upon receiving the list DOE would make a technical evaluation of the merits of the issues.**

**Please provide the list and DOE's evaluation for each issue.**

- A8. The Department is not aware that Ms. Busche raised any issues within any contractor issues management systems. However, Ms. Busche did raise issues directly to DOE Headquarters. The Department has directed the Office of River Protection to review and address the technical and safety issues she raised.**

**The items contained in the 45-item list Dr. Tamosaitis presented to contractors in 2010 have been captured and are either closed or being tracked to closure. Please see enclosure.**

- Q9. What steps, if any, has DOE taken to determine whether the firing of Donna Busche has discouraged other employees from identifying safety or environmental issues?**

- A9. Safety culture, like any other culture, is shaped by a wide variety of factors including the actions and behaviors of management and employees and the opinions expressed by community leaders, the media and others on the status of the culture. At the Office of River Protection (ORP), the safety culture has been reviewed and discussed very publicly since 2010. While it is difficult to define the precise impact any one particular action or event has on an organization's culture, what we do know is that there is still much work to be done to improve the culture at ORP, and we are fully committed to taking the steps needed to build and sustain a robust safety culture. Over the past couple of years, the Department has taken several steps to improve the culture at ORP and across EM. For example, we have trained over 1,800 federal and contractor managers on the principles of and steps needed for ensuring a Safety Conscious Work Environment (SCWE). As a result, we have seen increased SCWE awareness and knowledge across our management**

**Research Technology Technical Item List  
Submitted 2010**

Test Number	Control System Number	Modification / Description	Event Date / Test Date	Item	Description	Owner	Closure or Technical Reference	Status	Notes/Comments	Current Status (4/29/14)
1	N/A	R&T	2010	Improved Efficiency ULP-32 P&M Array	Improve the efficiency of the ULP-32 P&M array thereby reducing Energy and lab costs while improving mixing robustness. This would provide cost savings and risk reduction.	Kyle Kilroy	CCN220450 documents M3 Closure and references associated Vessel Assessments.	Closed	Closed based on the M3 Vessel Assessments demonstrating reasonable assurance that the vessels would meet their mixing requirements. Additional optimization was not deemed necessary since it is believed that benefits from further optimization would most likely be offset by the costs of further delay in design and procurement of equipment.	Open  This suggestion to do further optimization of the design was not recommended following M3 Closure (ref. CCN 220454 and CCN 220450). Cut Sheet 2010-002 was raised in July 2010 to perform Large Scale Integrated Testing to resolve risk issues identified in the M3 closure documentation. Cut Sheet 2010-002 was merged with 2010-004 in June 2013. Cut Sheet 2010-004 continues to track this issue.  Forecast closure date 2010 based on FSVT of standard vessel design (Cut Sheet 2010-004) Tech Team.
2	N/A	R&T	2010	Improved Efficiency ULP-1 P&M Array	Improve the efficiency of the ULP-1 P&M array thereby reducing Energy and lab costs while improving mixing robustness. This would provide cost savings and risk reduction.	Kyle Kilroy	Closed with Test 1. CCN 220450 documents M3 Closure and references associated Vessel Assessments.	Closed		Open  This suggestion to do further optimization of the design was not recommended following M3 Closure (ref. CCN 220453 and CCN 220450). Cut Sheet 2010-002 was raised in July 2010 to perform Large Scale Integrated Testing to resolve risk issues identified in the M3 closure documentation. Cut Sheet 2010-002 was merged with 2010-004 in June 2013. Cut Sheet 2010-004 continues to track this issue.  Forecast closure date 2010 based on FSVT of standard vessel design (Cut Sheet 2010-004) Tech Team.
3	N/A	R&T	2010	Non-Newtonian Mixing test	Demonstrate adequate mixing and bottom clearing with settling solids in a non-Newtonian slurry. Especially needed under 6-16 Pa.	Kyle Kilroy	This is tracked under Cut Sheet # 2010-0006 (M3 Closure Package Volume 3). Cut Sheet was closed in September 2010.	Closed	Pending future LSIT Activity per Outcasts 2010-2 and 2010-4	Open  Non-Newtonian mixing demonstration was informally evaluated during the LSIT informational testing campaign (CCN 218385 shows successful results of mixing testing with a 6Pa slurry simulant with fast settling solids).  Cut Sheet 2010-004 was raised in September 2010 to resolve risk issues identified in the M3 closure documentation for non-Newtonian mixing. Cut Sheet 2010-004 continues to track this issue.  Forecast closure date 2010 based on FSVT of standard vessel design (Cut Sheet 2010-004) Tech Team.
4	N/A	R&T	2010	P&V Capacity Evaluation	Evaluate the adequacy of the P&V system to handle P&M exhaust. Need review of the complete air system.	Bob Voita	This is addressed in issued study 24350-WTP-ES-EMO-10-001. Assessment of M3 impacts to Pulse Jet Mixing Support Systems: Plant Service Air (PSA), Pulse Jet Ventilation (PJV) and Pretreatment Vessel Vent Systems (PVP/PVV). Further, this will be addressed in individual system descriptions.	Closed		Closed  If a standard vessel size is adopted for high solids vessels in Pretreatment, this study will need to be revised to address the impacts to the PVJ and PVP/PVV systems. However, this potential change is likely to reduce ventilation requirements not increase them. Any changes to the WTP design based on FSVT of the standard vessel design testing will be performed following WTP engineering procedures.
5	N/A	R&T	2010	P&M air use strategy and operating plan review	Need to review the P&M air use plan to ensure all tanks are sized adequately and consistently.	Bob Voita	Closure is being tracked with Test 4	Closed	PVP System calculations and P&MAs are scheduled for issue in March 2012.	Closed  See response to Test 4 above
6	N/A	R&T	2010	Air System Review for Accumulator capacity	Are more accumulators needed in the air system? Can the air system provide what is needed with the many changes that have been made?	Bob Voita	Closure is being tracked with Test 4	Closed	PSA System design has been updated and is awaiting completion of a safety evaluation by EAHB before approval and issue.	Closed  See response to Test 4 above
7	N/A	R&T	2010	Temp and Moisture Impacts on RF Rustin	Analyze RF test data for temperature impacts on RF rate and capacity. Recent test data as part of M3 process limits indicates a reduced operating range at higher temps and moisture.	Steve Barnes	Tests, as a part of M3 Phase 2, are currently in progress. Refer to CCN 193548 and 24350-WTP-PL-RT-07-0002, Row 0	Open	This test scope is defined in Test Plan 24350-CL-HC9-WA93-00001-02-00014, Row 06B (WTPSP-002, Row 2.0) and is currently in progress at PH04.	Open  Testing is complete, closure of this item is tracked in ATS-11-0703. Forecast closure date 12/31/14.
8	N/A	R&T	2010	PT M3 Process Limits Evaluation	Conduct M3 Process Limits review for PT process. PT process limits assessment was not done pending resolution of the Bowshock.	Steve Barnes	This work is already funded. Pre-planning work is in progress.	Open	This test scope is defined in Test Plan 24350-CL-HC9-WA93-00001-02-00014, Row 06B (WTPSP-002, Row 2.0) and is currently in progress at PH04.	Open  This item is tracked in ATS-14-0114. Forecast closure date 12/31/18
9	N/A	R&T	2010	Heat Pump out Demo	Demonstrate performance of heat pumpout system. Do it now vs startup and reduce SAU time and risk. Include test of bypass and controls.	Kyle Kilroy	Cut Sheet 2010-0002 has been generated for large scale testing that replaces key recommendations from the TSD closure packages for M3 feedstocks vessels.	Open	Pending future LSIT Activity per Outcasts 2010-2 and 2010-4	Open  Forecast closure date 2010 based on FSVT of standard vessel design. This is being tracked with cut sheet 2010-004. Tech Team
10	N/A	R&T	2010	Process Control and pipe hangers design review	Process Control and pipe hangers design review based on higher than 1.5 gpg pumped out of tanks initially. Due to marginal mixing, the tanks will have a skewed concentration gradient with much heavier concentrations at the bottom of the tanks. This will initially impact pumpout.	Mike Westink	The cut sheet covers M3 closure. The SpG requirements were evaluated in the M3 vessel assessments and recommended changes were identified. Pre-treatment CAR 1st, Action 670 on M3 have crosswalk, tracks implementation.	Open	Piping design calculations are being revised based on higher SpG limits. Scheduled completion date for revising all Pretreatment Systems is March 2012.	Open  SAC Planned response to the CH2 GH Staff concerns is detailed in CCN 241253. Closure of this issue is also tied to completion of FSVT. Forecast closure date 2018 based on FSVT of standard vessel design (Cut Sheet 2010-004) Tech Team
11	N/A	R&T	2010	Sampling, Process Data and Systems Operating Review	A systems review is needed of the WTP process to examine for the possibility of operations with all the process requirements.	Bob Voita	This issue is addressed in CCN 230782, which cites the Performance Measurement Baseline activity the exposing the issue.	Closed	A process control DQO effort is scheduled for early 2012 to establish process limits and sampling requirements.	Closed  24350-WTP-RPT-MQT-12-014 was issued in October 2012 to close this issue
12	N/A	R&T	2010	Process control and product quality review	Sampling and lab time could exceed allowable time. Can process be kept within limits with current controls?	Bob Voita	This issue is addressed in CCN 230782, which cites the Performance Measurement Baseline activity the exposing the issue.	Closed	Closure is being tracked with Test 11.	Closed  24350-WTP-RPT-MQT-13-014 was issued in October 2012 and 24350-WTP-PL-PR-04-0001 (ESARD) was issued in March 2013

staff. We have also completed self-assessments across the EM complex to build the capacity to self-identify and correct issues when they first appear.

At ORP we have an Organizational and Safety Culture Improvement Council (OSCIC). The OSCIC consists of managers and staff representing a diverse cross-section of federal and contractor employees and disciplines with the specific knowledge, skills, abilities, and desire to successfully implement, manage, and model positive safety culture attributes at Hanford. ORP also has a zero-threshold issues management system. This is designed to both encourage and facilitate employees at all levels reporting any and every issue that causes them some level of concern. DOE, EM and ORP leadership at all levels is committed to improving the organizational safety culture and will continue to take the steps needed to ensure federal and contractor employees feel free to raise issues without fear of retaliation.

#### Whistleblower Retaliation at the Hanford Nuclear Site

Q10. Why does DOE require approval before contractors at Hanford dismiss “key personnel” without cause?

A10. The WTP Key Personnel clause states that the contractor must notify the Contracting Officer “[p]rior to ... diverting any of the employees in [Key] Positions to other positions.” The clause thus does not speak to a situation where the contractor dismisses an employee rather than choosing to move the employee to a different position. DOE’s later-issued standard key personnel clause (DEAR 952.215-70), which is included in more recent Hanford contracts, is more explicit on this issue, providing that contractors may not remove a key person without notice to and approval from DOE, except where the contractor “deems immediate removal or suspension ... necessary to fulfill its

obligation to maintain satisfactory standards of employee competency, conduct, and integrity ...” Key personnel clauses generally are aimed at protecting the government against contractors bringing in less qualified leaders after the contract is awarded.

**Q11. At the hearing, DOE officials stated that if the Inspector General found that the contractor retaliated against Ms. Busche, DOE would “take action.”**

**What are the specific actions or steps that DOE could take?**

**A11. If the Inspector General found that the firing of Ms. Busche by her employer (a subcontractor) was retaliation against Ms. Busche as a consequence of whistleblower activities, DOE could take a variety of actions. At this time, it would be speculative to predict what the IG may find, what recommendations the IG might make to DOE, or what Departmental action would be appropriate. Although not an exhaustive list, DOE would expect the prime contractor to take appropriate action with its subcontractor in response to an IG finding. DOE could consider the retaliatory behavior in the context of any applicable provisions of the performance management plan in determining award fee payable to the contractor. DOE could review the allowability of costs, most notably any costs that were provisionally allowed, that were incurred to defend against any whistleblower allegations that are found to have merit. DOE could explore whether termination of the prime contract is appropriate. DOE could also take action in the form of documenting the matter in the contractor past performance database used by agencies to evaluate a contractor’s past performance for purposes of obtaining future government contracts and/or consider whether to propose for suspension or debarment individuals or contractors.**

**Q12. According to Ms. Busche, Shirley Olinger, the former DOE Manager for DOE's Office of River Protection, "censored" notecards she was allowed to receive from her staff during her October 2010 testimony before the Defense Nuclear Facilities Safety Board. According to Ms. Olinger, "[t]he specific questions about [Ms. Olinger's] involvement back when I was working for DOE were well worked with DOE-HQ's general counsel years ago. They have my answers documented..."**

**Please provide Ms. Olinger's account of why she supposedly "censored" Ms. Busche's notecards, as well as any actions DOE took in response.**

**A12. While DOE officials recall that the Department looked into what transpired at the October 2010 DNFSB hearings, the Department has not located information that would illuminate the specific event to which the Committee's question appears directed.**

**Q13. DOE states that one of the purposes of the employee concern program is to address concerns in a timely manner. Ms. Busche filed an employee concern letter in October of last year. DOE's response to most concerns was that it would not consider them because they were the subject of litigation. However, complaints made to the Department of Labor frequently sit for a year without resolution.**

**Q13a: Why won't DOE look into these problems at the same time as the courts or the Department of Labor?**

**A13a: The Department's Employee Concerns Program (ECP) provides DOE federal and contractor employees with a voluntary, independent avenue for the reporting of concerns related to issues such as the environment, safety, health, and management of DOE programs and facilities. The ECP is intended to supplement, not replace, existing processes designed to address concerns and resolve disputes.**

**A DOE contractor employee may choose to utilize the Department's ECP, the Department's 10 C.F.R. Part 708 contractor whistleblower protection program process, relevant Department of Labor processes, and/or litigation, among other avenues, to address his/her concerns. The choice of which process to utilize, if any, rests solely with**

the employee.

However, the Department's ECP generally will not process a concern when an employee has filed a complaint on the same or related matter(s) in another forum, such as with the Department of Labor. The primary reason for this is that the ECP was designed as an alternative mechanism, rather than as a concurrent process, for the resolution of concerns.

If the Department were to allow an employee to file a concern with the ECP when the employee was also seeking redress through a regulatory process or court, there is the potential for conflicting findings/conclusions based on different burdens of proof and criteria. In addition, such a system would result in inefficiencies in agency resource utilization as a result of duplication of efforts.

**Q13b:** Does DOE believe that it is timely addressing employee concerns by referring them to the courts?

**A13b:** An individual may voluntarily choose to bring a matter to court. However, the Department's Employee Concerns Program does not refer concerns to the courts.

**Q14.** Does DOE anticipate any further increases in the cost of the Waste Treatment Plant?

**A14.** Yes. The Department is moving forward with rebaselining the WTP project in phases. The Department has directed the contractor to develop a contract modification proposal



for completing the Low-Activity Waste, Balance of Facilities and the LAB facilities.

After the Department better understands the magnitude of the effort necessary to address the Pretreatment (PT) and High-Level Waste (HLW) Facilities technical challenges, the DOE will then direct the contractor to develop subsequent contract modification proposals for the HLW and PT Facilities. Corresponding contract modifications and rebaselining will be performed to ensure alignment between the baseline and the contract.

**Q15a.** The Secretary of Energy met with concerned individuals from Hanford last year.

Is DOE aware that it may have disclosed the names of those individuals to contractor management?

**A15a.** During his confirmation hearing before the United States Senate, Secretary of Energy Ernest Moniz committed to a number of immediate actions, including meeting with concerned individuals at the Hanford Site. Secretary Moniz made his first visit to Hanford shortly after his confirmation, and his agenda included meetings with concerned individuals. The Department met with these individuals off site without any request for confidentiality.

**Q15b.** Does DOE have any procedures for communicating or interacting with individuals who claim whistleblower status?

**A15b.** The Department established 10 CFR 708, and with its contractors, have established Employee Concerns, Differing Professional Opinion, Equal Employment Opportunity, and other programs, with approved procedures and processes that help facilitate discrete interactions with employees who raise safety and other concerns. The procedures associated with these programs allow contractor personnel to raise concerns through the DOE programs.

**Q15c. What is the current status of the plan DOE is required to submit by June under the 2014 National Defense Authorization Act regarding the Waste Treatment Plant?**

**A15c. DOE is finalizing the plan and will submit it when complete.**

**Q16. At the hearing, DOE officials refused my request for you to appear on the same panel as witnesses representing URS and Bechtel. Please explain why.**

**A16. Executive Branch officials are almost always afforded the opportunity to testify on panels that exclude non-governmental private sector witnesses.**

**This practice is an important reflection of comity between two co-equal branches of government that permits government agency officials to contribute to the hearing process while enabling them most efficiently to use the time their many duties demand.**

**Observance of this practice also recognizes the differing nature of functions and responsibilities between private business entities and federal agencies responsible for execution of the laws that affect such private sector entities. This is especially important where, as was the case here, the private sector contractors were subject to regulation by the Department in the underlying matters that were the focus of the subcommittee's hearing.**

## **QUESTIONS FROM SENATOR RON JOHNSON**

### **Whistleblower Retaliation at the Hanford Nuclear Site**

**Q1. Ms. Busche was listed as "Key Personnel" on Bechtel's contract for the Waste Treatment and Immobilization Plant (her direct employer was URS, a subcontractor). You stated that the Department of Energy (DOE) was not asked about, and did not approve, her termination. Under the terms of the contract, what are the requirements for Bechtel/URS to notify and/or consult DOE when changing Key Personnel? In practice, how is this typically handled? What are the contractor's obligations in a case like Ms. Busche's where the contractor decides to terminate Key Personnel for cause?**

**A1. The WTP Key Personnel clause does not include limits on a contractor's authority to terminate an employee for cause, nor does it require the Department's prior notification or consent for such a termination. The clause states that the contractor must notify the CO "[p]rior to ...diverting any of the employees in [Key] Positions to other positions." In this situation, the contractor did not divert a key person to an "other position" and, thus, the clause does not speak to this situation. Thus, BNI did not have a contractual obligation to notify DOE or seek its consent before URS terminated Ms. Busche for cause. More recent Hanford contracts contain a standard key personnel clause that contains a notification requirement, but no requirement to obtain DOE consent.**

**Q2. Please provide information sufficient to show that DOE has personnel in appropriate numbers and expertise to oversee the contractors' performance of nuclear remediation work on its behalf.**

**A2. Office of River Protection:**

**The Office of River Protection (ORP) has approximately 135 full-time equivalents (FTEs) on board. Within those 135 FTEs, approximately 40 work on the Waste Treatment and Immobilization Plant (WTP) project with approximately 30 of these FTEs in the Engineering, Project Controls, and Construction Oversight and Assurance Divisions in**

addition to the Federal Project Directors. Tank Farms has approximately 30 FTEs with approximately 10 FTEs working in the Operations Division, performing operational oversight. There are also approximately 35 FTEs providing technical and regulatory support to both the WTP and Tank Farms with approximately 20 of these FTEs providing nuclear safety, and safety and health oversight. From a Contracting Officer perspective, ORP currently has 7 Contracting Officers.

At Department of Energy Headquarters, there are approximately 17 FTEs dedicated full-time to oversight of ORP, including personnel from:

- The EM Office of Tank Waste & Nuclear Material
- The EM Office of Safety, Security and Quality Programs
- The EM Office of the Chief of Nuclear Safety
- The EM Office of Acquisition and Project Management
- The DOE Office of Acquisition and Project Management

Additionally, the Department's Office of Independent Assessment provides independent oversight assessments and enforcement using its technical staff based upon its analysis of site issues and conditions, project activities, and operational events.



## Department of Energy

Washington, DC 20585

July 8, 2014

The Honorable Mike Rogers  
Chairman  
Subcommittee on Strategic Forces  
Committee on Armed Services  
U. S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

On April 8, 2014, David G. Huizenga, Acting Assistant Secretary for Office of Environmental Management testified regarding Fiscal Year 2015 Budget Request for Atomic Energy Defense Activities and Nuclear Forces Programs.

Enclosed are the answers to three questions that were submitted by Representative Loretta Sanchez and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher E. Davis".

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosure

cc: The Honorable Jim Cooper, Ranking Member



## QUESTIONS FROM CHAIRMAN MIKE ROGERS

Q26. Please update us on the investigation into the fire and radiation release at the Waste Isolation Pilot Plant in New Mexico.

a. What has been found?

A26a. Following the February 5<sup>th</sup> salt haul vehicle fire and the February 14<sup>th</sup> radiological release events, DOE commissioned two Accident Investigation Boards (AIB). The vehicle fire AIB final report and initial radiological release AIB report have been issued and the Department is currently developing formal Corrective Action Plans for both. After the final radiological release AIB report is prepared and issued, a separate Corrective Action Plan will be prepared.

DOE continues to investigate the cause of the February 14<sup>th</sup> radiation release. In the underground, the focus has been on taking photographs and videos of the waste stacks, taking samples and swipes, and retrieving filter paper from the continuous air monitor. During the month of June, underground entries have been suspended while High Efficiency Particulate Air filters in the ventilation system are replaced. After this filter evolution is complete, underground entries will start again for further investigation, surveying, maintenance, decontamination and other activities. The information obtained during the investigation is being analyzed by some leading experts in various fields of expertise. All of this is being studied to try to determine the cause of the release. Based on recent entries into the WIPP underground, the AIB is evaluating the contents of a set of waste drums that came from Los Alamos National Laboratory (LANL) that are located in Panel 7. The AIB is looking at the

possibility that a chemical reaction may have occurred within a drum, causing a potential high-heat event and a subsequent release.

b. How long do you expect the shutdown to last?

A26b. The length of the time required to recover from the incident cannot be fully known until the cause of the event is understood and recovery planning is completed.

c. How is the shutdown at WIPP sending ripple effects across the DOE-EM complex?

A26c. We are carefully evaluating the impacts to other Department of Energy sites including impacts on commitments with regulators. Specific impacts being evaluated include the Department's ability to meet: the removal of all legacy transuranic (TRU) waste from the Idaho National Laboratory by December 31, 2018, and, certain milestones for the WIPP certification of contact-handled and remote-handled TRU located at the Oak Ridge Reservation beginning September 30, 2015.

## QUESTIONS FROM CHAIRMAN MIKE ROGERS

Q27. Is EM on track to meet its regulatory and compliance agreements for FY14? What about for FY15 and beyond?

A27. The Environmental Management (EM) program will make significant cleanup progress with the President's fiscal year (FY) 2015 budget request of \$5.6 billion. Assuming Congress appropriates the President's request, key progress will include continued efforts on radioactive tank waste stabilization, treatment, and disposal; special nuclear material consolidation, stabilization, and disposition; transuranic and mixed/low-level waste disposition; and excess facilities deactivation and decommissioning.

While significant cleanup progress has been achieved and will continue to be made in fiscal years 2014 and 2015, several challenges have impacted our progress on certain important projects. These challenges include the Balanced Budget and Emergency Deficit Control Act, which enacted sequestration, reduced EM funding by \$394 million in FY 2013, and the FY 2014 lapse in appropriations and partial-year Continuing Resolution delayed work. The culmination of these events is anticipated to delay some FY 2015 milestones that cannot be met even with additional funds.

To the extent milestones are anticipated to be delayed, DOE will follow the provisions of its cleanup agreements for working with regulators regarding milestone adjustments, as necessary.



## QUESTIONS FROM REPRESENTATIVE SANCHEZ

### NATO B61 Funding:

Q48. United States taxpayers are expected to cover much of the modernization of the B61s through a life extension program which is to cost around \$2.1 billion.

- a. The total program cost estimate of the B61-12 Life Extension Program as reported in the last Selected Acquisition Report dated 30 September 2013 is \$7,344M with an additional \$0.811M leveraged from NNSA stockpile services and campaigns. Are there any plans for NATO countries to contribute to the cost of the B61 life extension program of the B61? How much is NATO paying in FY14 for its share in terms of contribution to NATO nuclear sharing?

A48a. The B61-12 is a critical component of the U.S. commitment to NATO through extended deterrence. NATO allies participate in the security alliance through sharing arrangements involving the use of facilities, aircraft and personnel but not in the direct development or production of U.S. nuclear weapons. These arrangements and planned activities to assure aircraft compatibility with the B61-12 are best explained by the Department of Defense.

- b. Are there plans to re-evaluate the number of B61s that will undergo the life-extension program? And is nuclear sharing with NATO consistent with Article 1 of the Nuclear Non-Proliferation Treaty which says "nuclear states will not assist non-nuclear weapon states in acquiring nuclear weapons"?

A48b. During the testimony, Mr. Weber stated that the number of B61-12s is subject to change as our nuclear posture evolves and will be assessed annually. Yes, U.S. deployment of nuclear weapons on the territories of our NATO allies is consistent with Article I of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). This article of the treaty deals only with what is prohibited, not with what is permitted. Under Article I of the Treaty, "Each

nuclear-weapon State Party...undertakes not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices directly, or indirectly;...." No such transfer occurs under NATO nuclear defense planning. The issue of U.S. deployment of nuclear weapons on the territories of our NATO Allies was thoroughly considered during the negotiation of the NPT in the 1960s. This issue was of significant interest to NATO Allies and to the Senate during the NPT ratification hearings.



**Department of Energy**  
Washington, DC 20585

July 28, 2014

The Honorable Barbara Boxer  
Chairman  
Committee on Environment and Public Works  
United States Senate  
Washington, DC 20510

Dear Madam Chairman:

On December 11, 2013, Steven Chalk, Deputy Assistant Secretary for Renewable Power, Office of Energy Efficiency and Renewable Energy, testified regarding an "Oversight Hearing on Domestic Renewable Fuels."

Enclosed are the answers to eight questions that were submitted by Senators Thomas R. Carper, Benjamin L. Cardin, Deb Fischer, and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, which appears to read "Christopher E. Davis", is placed above the printed name.

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable David Vitter, Ranking Member



## QUESTION FROM SENATOR BOXER

**Q1. Can you please provide an explanation of DOE's E15 fuel testing and the testing results that supported the Environmental Protection Agency's approval of E15 for use in motor vehicles?**

**A1. The Department conducted robust testing of the potential effects of E15 and E20 on vehicles and engines. This work included an examination of emissions, catalyst and engine durability, drivability and operability, and materials compatibility, and covered both automobile engines as well as smaller engines. The catalyst durability study—which represented about half of the spending, included 86 vehicles driven more than six million miles, used more than 300,000 gallons of fuel, and included about 1,000 emissions tests. A subset of vehicle engines (18) were torn down after completion of the testing and no unusual fuel-related damage or accelerated wear was found in those engines operated on E15 or E20.**

The primary criterion for new fuel or fuel additive approval specified in the Clean Air Act is whether the candidate fuel damages the emissions control systems of vehicles over their full useful life (currently 120,000 miles). The Department's test program used the Standard Road Cycle, a test cycle specified in EPA regulations in the CFR for aging vehicles to full-useful life. Statistical analysis of the test fleet emissions results showed that aging vehicles with ethanol blends did not affect emissions changes over time differently than aging with E0. The Department also conducted studies of the immediate emissions effects, drivability of vehicles, fuel system materials compatibility, and operability and durability of engines.

## QUESTION FROM SENATOR CARPER

**Q1. Under EPA's analysis in the recent 2014 proposed rule, the EPA has determined there is not the available infrastructure to handle the increased levels of biofuels required under the Clean Air Act. If the EPA adjusts the RFS downward to meet the current infrastructure, what drives new investments in infrastructure to handle future volume requirements? Can you tell the Committee, how does this nation get past the blend wall under the current proposal? How can this country incentivize the increased investments in E85 pumps, E15 pumps, and vehicles that are optimized for future ethanol blends?**

**A1. The U.S. Department of Energy (DOE) recognizes that the blend wall is a critical issue for the biofuels industry. Under cost-shared partnerships with industry, DOE has made significant investments to catalyze the commercialization of advanced cellulosic ethanol technologies by demonstrating several pioneer commercial-scale biorefineries. As these plants come on line, investors will have the cost and technical data necessary to decide whether to build additional supply. New cost-competitive biofuel supply coming on line will impact future Renewable Fuel Standard adjustments by the U.S. Environmental Protection Agency and increase demand for biofuels. In turn, the market can respond to this increased demand by investing in refueling and distribution infrastructure. In the longer term, DOE's Bioenergy Technologies Office is collaborating with partners in industry and at universities and the national laboratories to invest in the research, development, and demonstration of biorefineries that will produce advanced hydrocarbon biofuels—produced from cellulosic biomass and algae. These fuels—bio-based gasoline, diesel, and jet fuel—often described as “drop-in” fuels, are largely compatible with existing petroleum-based distribution and vehicle infrastructure and not to be impeded by the “blend-wall.”**

## QUESTIONS FROM SENATOR CARDIN

**Q1. Would national deployment of separate pumps and storage tanks for E15 and other higher ethanol fuel blends provide better prevention against misfueling?**

**A1. The U.S. Environmental Protection Agency has promulgated regulations to help prevent misfueling with E-15 in vehicles older than 2001 model year and other engines and equipment. EPA has also established additional measures through the EPA-approved misfueling mitigation plans, which should further help prevent misfueling. More information is available online to the industry and others (see <http://www.epa.gov/otaq/regs/fuels/additive/e15/e15-mmp.htm>). It should be noted that there are currently misfueling events with widely-distributed fuels—including gasoline and diesel—and with sparsely distributed fuels, including E-85. E-85 nozzles and tanks are already separate from the tanks and nozzles that dispense E-10.**

**a. What are the cost estimates for making such upgrades to our fuel retail infrastructure?**

**A1a. The cost to install E15-compatible infrastructure today varies widely and depends on the specific situation and number of pumps installed. DOE does not have any costs estimates for installing E15-compatible infrastructure and is not able to validate any of the estimates provided by industry, but provides the following cost information from both the Petroleum Equipment Institute and the Renewable Fuels Association. The Petroleum Equipment Institute estimated the average cost of installing E15 equipment for multiple scenarios and found that a two-dispenser system would vary between about \$2,000 and \$166,000—depending on the specific existing station equipment, the extent of renovations required, and whether underground storage tanks were replaced/installed. Stations that are just replacing**

pumps can do so with modest investment: the Renewable Fuels Association reports that, “the stations that offer E15 today have spent an average of just \$10,000 per station to add the product—or slightly less than \$0.01 per gallon of gasoline sold.” As vehicles built before model year 2001 drop out of inventory and as more automobile manufacturers warrant their new vehicle models for E15 use, there will be less need to have separate pumps for E10 and E15. Similarly, as refueling infrastructure ages and is due for replacement, existing infrastructure can be replaced with E15-capable equipment.

Sources:

<http://www.pei.org/portals/0/resources/documents/USDA-letter-e15.pdf>

<http://www.ethanolrfa.org/news/entry/pei-report-shows-actual-cost-of-installing-e15-is-much-lower-than-claimed/>

**b. Who should bear the costs of such infrastructure improvements?**

A1b. For widespread adoption, fuel marketers will initially pay for any new infrastructure, and over time they would expect to recover this investment from fuel buyers through the sale of the fuel.

**c. Is DOE aware of what sort of investment and financial support the ethanol production industry has provided fuel retailers to install these types of infrastructure improvements?**

**i. If so, how much?**

A1c. The U.S. Department of Energy (DOE) is not aware of any subsidy provided by the ethanol industry for installation of E15 storage tanks or fuel pumps. However, a number of states provide incentives. DOE maintains a searchable database of these incentives through its Alternative Fuel Data Center.

**d. Should U.S. taxpayers?**

**A1d.** Historically, private investment has built out large-scale infrastructure; this investment is returned through fuel sales. The U.S. Department of Energy (DOE) is not involved in determining the distribution of costs associated with infrastructure upgrades at retail stations. However, DOE has worked with dispenser manufacturers and Underwriters Laboratory (UL) to develop retrofit kits that enable popular dispensers designed for use with E10 to be adapted for use with E15 without compromising UL listing of the equipment. These kits are available from the two major dispenser manufacturers at an installed cost of a few thousand dollars.

**Q2.** **If Butamax technology were deployed onto all of the corn ethanol refineries that it could be retrofit onto, could corn starch-derived fuels make up all of the RFS's volume mandates (aside from the specific volumes for biodiesel and cellulosic biofuels)?**

**A2.** Conversion of corn starch to biobutanol (using Butamax or similar technology) could potentially satisfy a significant fraction of the total renewable fuel volume mandated by the Renewable Fuel Standard. This assumes current yields and factors in an energy equivalence difference between ethanol and biobutanol.

The level of market penetration of this technology would be sensitive to the cost of production for biobutanol and other factors including approval of additional biobutanol fuel pathways (advanced or conventional), blending allowances in gasoline and other such factors.. The focus of the U.S. Department of Energy's research and development activities has been on the conversion of lignocellulosic feedstocks such as corn stover into ethanol and hydrocarbon-based fuels. Our assessment is that the conversion of lignocellulosic-derived feedstocks into biobutanol remains expensive and would likely



not be cost competitive without subsidies in today's fuel market. However, since biobutanol can also be used as an intermediate chemical for the production of higher value co-products, these fuels have the potential to become more economically viable.

- a. If corn starch-derived biobutanol were to become the dominant advanced biofuel by 2022, and biobutanol in combination with conventional ethanol, comprised all of the statutory volume requirements under the RFS, and assuming that the existing acres dedicated to corn only increased by 20%, what percentage of our nation's corn supply would be converted into fuel products?**

**A2a.** Our calculations indicate that under these assumptions there would be insufficient volumes of fuel to meet the RFS requirements. This assessment assumes currently observed yields of biobutanol from corn. If substantial improvements in butanol yield could be achieved through research and development, then butanol could supply a larger portion of the RFS. There is also significant scope for improved yields of butanol from lignocellulosic feedstocks.

- Q3. Based on the analysis of the RFS requirement being 36 billion gallons in 2022, what percentage of ethanol would need to be added to gasoline in order to meet the statutory volume requirements by that date?**

**A3.** It is difficult to calculate an exact percentage of ethanol that would have to be blended with gasoline in order to meet the statutory volume requirement of the RFS by 2022. The Energy Information Administration forecasts mid-term energy market consumption and demand trends. These projections are regularly updated and changed due to market influences (e.g. changes in projected petroleum consumption due to the level of economic growth and promulgation of vehicle efficiency standards that result in reduced projected gasoline consumption). The exact percentage of ethanol required to satisfy the RFS in any given date would depend on these factors.

**Q4. What is the Department of Energy current program funding to assist in the startup of the advanced biofuels industry?**

**A4. The U.S. Department of Energy's (DOE's) Bioenergy Technologies Office's FY 2014 enacted funding is \$232.3 million, and the Office has requested \$253.2 million for FY 2015.**

**With successful completion of research and development of cellulosic ethanol, DOE's cellulosic ethanol activities are now focused on demonstrating this technology in pioneer commercial-scale biorefineries, with industry providing significant cost share.**

**Our bioenergy research and development is now entirely focused on "drop-in" biofuels (gasoline, diesel, and jet fuel) that can be competitive with petroleum-based fuels in the market.**

**With this current focus on drop-in hydrocarbon fuels, the Office is pursuing multiple pathways, including thermochemical-, catalytic-, biochemical-, and hybrid conversion routes for lignocellulosic and algal feedstocks—with the goal of achieving \$3.00/gasoline gallon equivalent by 2022 with at least 50% greenhouse gas reduction on a lifecycle basis. Some pathways, such as pyrolysis, are expected to demonstrate their ability to be cost-competitive as early as 2017. Several pilot demonstrations of "drop-in" hydrocarbon fuels—including algae based fuels—are underway within the program as well.**

**a. Has DOE spent hundreds of millions for biorefining and algae?**

**A4a.** In FY 2014, the U.S. Department of Energy (DOE) Bioenergy Technologies Office's enacted funding is \$232.2 million with 66.7% in research and development (R&D) and 33.3% in demonstration activities that include integrated biorefinery facilities at various scales. The majority of the funding is dedicated to R&D in order to increase knowledge in technologies to convert renewable biomass to "drop-in" hydrocarbon fuels and chemicals at reduced cost. After successfully meeting R&D targets for pathways to convert cellulosic feedstocks to ethanol, DOE is completing support for the demonstration of these pathways and similar technologies at scale to reduce technical risk associated with new technology and validate the projected costs.

Over the last decade, DOE has awarded approximately \$1 billion in 29 integrated biorefinery projects at three different scales: pilot, demonstration, and commercial.

- 13 plants at pilot scale, roughly processing 1-10 tons of feedstock per day and < 1 million gallons per year to validate laboratory technologies and processes in an integrated but sub-scale demo
- 10 plants at the demonstration scale, approximately 50 tons per day, and 1-5 million gallons per year
- 6 plants at pioneer scale, which refers to first-of-a-kind, commercial-scale demonstration.

DOE's role in demonstration is to help overcome the significant risks with new technologies that the private sector would not be willing to financially bear alone. However, once validated at pioneer scale, industry and the investment community have the necessary technical and economic data to utilize when making further investment decisions.

In 2013, the United States' first pioneer cellulosic ethanol plant at commercial scale, supported by DOE, began production and commercial sale of product. This plant has an annual cellulosic ethanol production capacity of 8 million gallons per year (mmgy). Two additional commercial-scale biorefineries are expected to complete construction and commissioning by the end of 2014. These facilities will add a production capacity of more than 50 mmgy of domestic cellulosic ethanol.

Existing projects in DOE's demonstration portfolio are in final phases; thus, DOE's Bioenergy Technologies Office, which oversees the management and funding of these biorefinery facilities, has requested \$105 million in the FY 2015 Congressional Budget Request for demonstration activities. Approximately \$35 million will be used to initiate new pilot- and demonstration-scale projects for promising technologies to produce advanced hydrocarbon biofuels. In addition, \$60 million of that total is requested to support the intent of the memorandum of understanding signed by DOE, the U.S. Department of Agriculture, and the U.S. Department of Navy through the Defense Production Act activity to fund commercial-scale biorefineries that produce military specification fuels including jet fuel. The remaining \$10 million is requested to support understanding of fuel, engines, and infrastructure optimization for mid-level cellulosic ethanol content fuels and hydrocarbon drop-in fuels in collaboration with the Vehicles Technology Office.

DOE's Algae and Advanced Feedstocks subprogram has a multi-year implementation strategy that includes a diverse portfolio of developing algae cultures, improving productivity and yield, improving quantitative and techno-economic analysis of

technology options, and strategically investigating opportunities to accelerate progress towards achieving sustainable algal biomass production and logistics systems. After the 2009 Recovery Act investment of \$150 million in algal biofuel technologies (this includes the funding of the research consortium initiative and algae integrated biorefineries), since FY2010 the Algae Program has invested an additional \$130 million in new algal biofuel activities (this figure includes the program's recent FY 2014 appropriation of \$30 million).

The Algae subprogram and algae-based biofuel projects have continuously produced technology and innovation breakthroughs to help the advanced biofuels industry advance towards commercialization.

**b. Does EPA's proposed rule help or hurt the companies you are investing in?**

A4b. The U.S. Environmental Protection Agency's (EPA's) proposal seeks to put the Renewable Fuel Standard (RFS) on a steady path forward—ensuring the continued long-term growth of the renewable fuels industry while seeking input on different approaches to address the “E-10 blend wall.” The U.S. Department of Energy supports the goals of the RFS to increase biofuel production and use because biofuels have an important role to play in increasing our energy security, providing consumers with greater choices, fostering rural economic development, and reducing greenhouse gas emissions from the transportation sector. Through its research, development, and demonstration activities, DOE works in partnership with industry to bring next-generation biofuels on line and aims to transform renewable biomass resources into commercially-viable, high-performance fuels.

Thanks in part to the RFS, the United States produced approximately 13 billion gallons of conventional ethanol in 2012, which directly supported tens of thousands of jobs across the U.S. economy. According to EPA's analysis from the 2010 RFS rulemaking, achieving the goals of the RFS will displace about 14 billion gallons of petroleum fuels in 2030 and reduce greenhouse gas emissions by the equivalent of taking close to 30 million vehicles off the road.

Meeting the targets for cellulosic biofuels has been challenging, but unprecedented progress is now underway, and maintaining the RFS is critical for keeping the 2022 volumetric targets within reach. Availability of feedstocks—such as agricultural waste, municipal solid waste, wood chips, energy crops, and other types of biomass—and developing technologies will help scale up production. Since an advanced cellulosic biofuels industry is now emerging, the RFS provides an important function in guaranteeing a market for these new fuels.

## QUESTIONS FROM SENATOR FISCHER

**Q1. DOE has partnered heavily with companies like Novozymes to develop the technology to convert cellulosic biomass to renewable sugars that can be used for advanced biofuels. Indeed, both the Department of Agriculture and the Department of Energy have invested significantly in the biorefinery space. Given that the EPA proposed rule would cut the volumes of renewable fuel in the marketplace, significantly constricting opportunities, where do you anticipate the biorefineries making cellulosic and advanced biofuels coming online will sell their product? Do you anticipate DOE's investment in this area will be affected by EPA's proposed rule?**

**A1. The U.S. Environmental Protection Agency's (EPA's) 2014 proposal discusses a variety of approaches for setting the 2014 standards and includes volume ranges for each biofuel category given the level of certainty in developing projections for biofuel use. The 2014 proposal also seeks input on what additional actions could be taken by government and industry to help overcome the blend-wall market challenge and to minimize the need for adjustments in the statutory renewable fuel volume requirements in the future. The proposal seeks to put the Renewable Fuel Standard on a steady path forward and supports the long-term growth and sustainability of the renewable fuel industry.**

In fact, EPA's proposed rule would actually increase targeted volumes for cellulosic ethanol, from 6 million gallons in 2013, to 17 million gallons in 2014. Four out of five of the biorefineries that EPA expects to produce cellulosic ethanol in 2014 have been supported by technologies emerging from DOE-funded research and development. These facilities have established off-take agreements for the fuel that they will be producing in the first few years of operation. The investment in these facilities is anticipated to demonstrate the commercial viability of these technologies—reducing the risk for future investments.

RFS is more than an incentive for just ethanol; it includes a wide range of advanced biofuels options that include drop-in replacement fuels, such as renewable diesel. DOE is investing in

research, development, and demonstration for advanced biomass-based hydrocarbon fuel that would be fully compatible with the existing infrastructure, and therefore, avoid challenges associated with the blend wall. Technical breakthroughs and operational best practices—developed through DOE’s work in support of cellulosic ethanol—are already being leveraged in the production of these advanced hydrocarbon biofuels, which will also contribute to meeting the goals of the RFS, and enable a broader expansion of the domestic market for biofuels.

In order to continue moving viable technologies from the laboratory to commercialization, DOE’s Bioenergy Technologies Office, which oversees the management and funding of the biorefinery facilities, has requested \$105 million in the FY2015 Congressional Budget Request in order to initiate new pilot- and demonstration-scale projects for promising technologies to produce advanced hydrocarbon biofuels, as well as to support the intent of the memorandum of understanding signed by DOE, the U.S. Department of Agriculture, and the U.S. Department of Defense through the Defense Production Act activity to fund commercial-scale biorefineries that produce military-specification fuels including jet fuel. Funding would also support understanding of fuel, engine, and infrastructure optimization for mid-level cellulosic ethanol content fuels and hydrocarbon drop-in fuels in collaboration with the Vehicles Technology Office.

- Q2. Can you explain the in-depth testing that DOE conducted of E15 in support of EPA’s approval of the fuel? For example, I understand that your testing was peer reviewed, and included standardized testing of 86 cars that represented all major vehicle models, which were each operated up to 120,000 miles – or more that 6 million miles in total – to ensure that E15 would not harm a vehicle.**



A2. The Department conducted robust testing of the potential effects of E15 and E20 on vehicles and engines. This work included an examination of emissions, catalyst and engine durability, drivability and operability, and materials compatibility and covered both automobile engines as well as smaller engines. The catalyst durability study, which represented about half of the spending, included 86 vehicles driven more than six million miles, used more than 300,000 gallons of fuel, and included about 1,000 emissions tests. A subset of automotive engines (18) was torn down after completion of the testing and no unusual fuel-related damage or accelerated wear was found in those engines operated on E15 or E20.

The primary criterion for new fuel or fuel additive approval specified in the Clean Air Act is whether the candidate fuel damages the emissions control systems of vehicles over their full useful life (currently 120,000 miles). The Department's efforts primarily focused on emissions control durability. DOE's test program used the Standard Road Cycle, a test cycle specified in EPA regulations in the CFR for aging vehicles to full-useful life. Statistical analysis of the test fleet emissions results showed that aging vehicles with ethanol blends did not affect emissions changes over time differently than aging with E0. The Department also conducted studies of the immediate emissions effects, drivability of vehicles, fuel system materials compatibility, and operability and durability of engines.