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Requested date:	04-August-2013
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Source of document:	TVA FOIA Officer 400 West Summit Hill Dr. WT 7D Knoxville, TN 37902-1499 Fax: 865-632-6901

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902-1401

September 25, 2013

This responds to your letter to the TVA Office of the Inspector General (OIG) dated August 4, 2013, requesting information under the Freedom of Information Act (FOIA) 5 U.S.C. § 552 (2012). You requested documents and any other response provided to the Bicameral Task Force on Climate Change in response to their February 25, 2013, letter to the TVA OIG.

Enclosed is a disk with the records responsive to your request. Included on the disk is a list of the responsive documents. Some of the documents are available on the TVA website and links to those documents are included in the list for your use.

For non-commercial requests, TVA's FOIA regulations (18 C.F.R. § 1301) provide that fees for the first two hours of search time and the first 100 pages of copying are waived. Since this response was made within those guidelines, there is no charge for processing your request.

If you have questions about this response, you may contact me at (865) 632-6945 or by e-mail to foia@tva.gov.

Sincerely,

Denise Smith
TVA FOIA Officer

Enclosure

Letter – March 29, 2013 (attached)

Letter – April 11, 2013 (attached)

Appendix A: TVA OIG Gap Analysis (attached)

Addendum to Appendix A: (attached)

Appendix B: Climate Change Adaptation Plan 2012
http://www.tva.com/environment/sustainability/index.htm

Appendix C: TVA Statement on Climate Change Adaptation
http://www.tva.com/environment/sustainability/index.htm

Appendix D: Integrated Resource Plan http://www.tva.gov/environment/reports/irp/

Appendix E: TVA Natural Resource Plan http://www.tva.gov/environment/reports/nrp/

Appendix F: TVA Environmental Policy http://www.tva.com/environment/sustainability/index.htm

Appendix G: TVA Strategic Plan http://www.tva.com/environment/sustainability/index.htm

Appendix H: TVA Procedures for Compliance with the National
http://www.tva.com/environment/reports/pdf/tvanepa_procedures.pdf

Appendix I: TVA Shoreline Management Initiative EIS
http://www.tva.gov/river/landandshore/landuse_shore.htm#feis

Appendix J: 2012 Strategic Sustainability Performance Plan
http://www.tva.com/environment/sustainability/index.htm

Appendix K: OMB Scorecard 2012 http://www.tva.com/environment/sustainability/index.htm

Appendix L: TVA Sustainability Plan Summary 2012
http://www.tva.com/environment/sustainability/index.htm

Appendix M: TVA Clean Air Agreement http://www.tva.gov/news/keytopics/cleanairagreement.htm
http://www.tva.gov/news/releases/aprjun11/pdf/clean_air_act_agreements_fact_sheet.pdf

Appendix N: TVA Annual Report on Energy Management FY2012 (attached)

Appendix O: TVA Excluded Facility Inventory FY2012 (attached)

Appendix P: TVA Reporting Units and Conversion Factors for Federal Energy Management Reporting (attached)

Appendix Q: Fleet Management Strategy (attached)

Appendix R: GHG Inventory Qualitative Statement FY2012 (attached)

Appendix S: TVA FEMP GHG Sustainability Data Report FY2008 (attached)

Appendix T: TVA Annual GHG Sustainability Data Report FY2012 (attached)

Appendix U: TVA Inventory Management Plan for the Comprehensive GHG (attached)

Office of the Inspector General
Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902-1401

March 29, 2013

The Honorable Benjamin L. Cardin, Co-Chair
The Honorable Edward J. Markey, Co-Chair
The Honorable Henry A. Waxman, Co-Chair
The Honorable Sheldon Whitehouse, Co-Chair
Bicameral Task Force on Climate Change
Hart Senate Office Building, Room 530
Washington, DC 20510

Dear Sirs:

This responds to your February 25, 2013, request to Richard W. Moore regarding climate change requirements, performance, and authorities at the Tennessee Valley Authority (TVA).

To address the first part of your request, we have identified the existing requirements and directives in legislation, regulation, executive order, and other directives that apply to TVA to include the following:

- National Energy Conservation Policy Act of 1978;
- Energy Independence and Security Act;
- Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance;
- Better Buildings Challenge;
- Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation;
- Energy Policy Act 2005;
- National Environmental Policy Act;
- Resource Conservation and Recovery Act;
- The Clean Air Act.

To determine whether TVA is meeting applicable requirements as listed in the legislation, regulation, executive order, and other directives specified above, we obtained TVA's Climate Change Adaptation Action Plan and TVA's Strategic Sustainability Performance Plan (SSPP) both of which were issued June 29, 2012. We compared planned and current action items in the two plans to the requirements and identified potential gaps. Our gap analysis is included in Appendix A. We determined TVA has addressed 77 percent of the climate change goals characterized in Appendix A. Specifically, we determined TVA has appropriate actions and/or plans in place for 24 of the 31 goals. We could not determine compliance with the 7 remaining goals because TVA did not supply documentation to demonstrate compliance. In the event we receive additional documentation, we will include this in our response to the second request. We have included the Climate Change Adaptation Action Plan and the SSPP along with supporting documentation in Appendices B through L. Appendix M contains TVA's plans for compliance with the Clean Air Act.

TVA will provide the Office of Management and Budget an updated SSPP by the end of June 2013 to describe progress made in meeting sustainability goals. After the Office of Management and Budget acceptance, we will provide you that update. We also plan to provide the remainder of your request by April 12, 2013.

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This letter is for your review and information. Information contained in this letter may be subject to public disclosure. If you have any questions or wish to discuss the information we provided, please contact me at (865) 633-7300 or Robert E. Martin, Assistant Inspector General, Audits and Evaluations, at (865) 633-7450.

Sincerely,

Richard W. Moore
Inspector General
Tennessee Valley Authority

SMN:DBS
Enclosures
cc (Enclosures):
OIG File No. 2013-15041

Office of the Inspector General
Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902-1401

Richard W. Moore
Inspector General

April 11, 2013

The Honorable Benjamin L. Cardin, Co-Chair
The Honorable Edward J. Markey, Co-Chair
The Honorable Henry A. Waxman, Co-Chair
The Honorable Sheldon Whitehouse, Co-Chair
Bicameral Task Force on Climate Change
Hart Senate Office Building, Room 530
Washington, DC 20510

Gentlemen:

This is our second response to your February 25, 2013, request to Richard W. Moore regarding climate change requirements, performance, and authorities at the Tennessee Valley Authority (TVA). In our first response, dated March 29, 2013, we identified the relevant requirements and directives and provided supporting documentation of TVA plans and policies that address climate change in Appendices A through M.

To address the second part of your request on the authorities to reduce emissions and make the nation more resilient to the effects of climate change, TVA has sufficient authority to address potential impacts in the Southeast and especially to the Tennessee Valley river system. TVA was established by Congress in 1933 to address a wide range of environmental, economic, and energy issues in the region; and throughout its history, TVA has been able to manage its generation mix within the authorities Congress granted. With TVA's vision for 2020 described in Appendix G and other supporting documents included with our first response, greater focus is being placed on cleaner energy sources, reducing reliance on coal generation, and improving energy efficiency in facilities and with customers. These and other efforts planned by TVA under the authorities granted by the TVA Act will continue to reduce emissions and contribute to regional resilience from the effects of climate change. More specifically, the TVA Act granted broad authorities for TVA to manage real and personal property necessary for business; construct dams, reservoirs, power structures, new plants, and transmission lines necessary to unify the power system; produce and sell electric power; and develop and regulate the Tennessee River system in order to control flooding, improve navigation, and promote interstate commerce, among other goals.

We are providing an Appendix A Addendum to the TVA-OIG Gap Analysis provided with our first response to document how TVA is addressing the identified potential gaps. As identified in this appendix, TVA has demonstrated that appropriate actions and plans are in place to address all the requirements and directives we previously identified. We are also providing supporting documentation in Appendices N through U to include TVA's Annual Energy Management Report for fiscal year 2012 and seven accompanying enclosures. TVA submitted these eight documents to the Department of Energy's Federal Energy Management Program on January 31, 2013, to meet National Energy Policy Act and Executive Order 13514 reporting requirements.

With respect to your question regarding the most effective additional steps to be taken, TVA incorporates plans, such as the Integrated Resource Plan, into ongoing business planning processes. TVA is implementing those plans and taking the steps to effectively meet the vision of a more balanced generation portfolio. These efforts will reduce TVA's carbon footprint in the Southeast and increase sustainability practices over time. As we previously stated, after acceptance by the Office of Management and Budget, we will provide you TVA's updated Strategic Sustainability Performance Plan, which is due in June 2013 and describes planned yearly actions to be taken to meet sustainability goals.

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This letter is for your review and information. Information contained in this letter may be subject to public disclosure. If you have any questions or wish to discuss the information we provided, please contact me at (865) 633-7300 or Robert E. Martin, Assistant Inspector General, Audits and Evaluations, at (865) 633-7450.

Very truly yours,

Richard W. Moore

Richard W. Moore

Enclosures
cc (Enclosures):
OIG File No. 2013-15041

Tennessee Valley Authority
Office of the Inspector General
Gap Analysis

Goal / Target	Executive Order (E.O.) 13514	E.O. 13423	Existing Statute	Actions Referenced in TVA's Strategic Sustainability Performance Plan (SSPP), Supporting Documentation, and Discussion with TVA Policy and Oversight Personnel	Link to TVA's Strategic Sustainability Performance Plan (SSPP) and Climate Change Adaptation Plan (CCAP)	Gaps Resulting from Comparison of TVA Actions to Requirements and Directives
Greenhouse Gas (GHG) Baseline	Prepare baseline of GHG emissions for scope 1 and 2 emissions for fiscal year (FY) 2008 by January 3, 2010; for scope 3 GHG emissions by June 2, 2010 [§7((b)(i)].			TVA developed baselines for scopes 1, 2, and 3 emissions for FY2008. [See table at bottom of p. 17 for baseline values.]	TVA SSPP pp.16-17	No Gap Identified.
GHG Emission Reductions	Establish agency-wide GHG emission percentage reduction targets by FY 2020 (baseline FY 2008) for: • Scope 1 and scope 2 GHG emissions by FY 2020 (due January 4, 2010). • Scope 3 GHG emissions (due June 2, 2010). [§2[a] and (b)]	Reduce GHG emissions through reduction of energy intensity by (1) 3% annually through FY 2015 or (2) 30% by FY 2015 (baseline 2003). [§2(a)]		TVA established GHG reduction targets for scopes 1, 2, and 3 emissions. Reduction target for scopes 1 and 2 is 17 percent by FY2020. Reduction target for scope 3 is 20.7 percent by FY2020. TVA is using almost half the energy of the federal average for goal-subject buildings. TVA is on track for 30 percent reduction by FY2015.	TVA SSPP pp.6, 16, 21, 37	No Gap Identified.
GHG Emission Reporting	Report comprehensive GHG emission inventory for FY 2010 by January 5, 2011, and annually thereafter by the end of January. [§2(c)]		[EISA §527]: Each Federal agency must issue an annual report that describes the status of initiatives to improve energy efficiency, reduce energy costs, and reduce GHG emissions. [EPA MGGRR]: Facilities and suppliers of fossil fuels or industrial GHGs that emit more than 25,000 metric tons of CO_2-emissions per year must report their emissions by March 31, 2011, for 2010 emissions. Reports submitted annually thereafter.	TVA will report Scopes 1, 2, and 3 GHG emissions in baseline year and annually thereafter. The scopes 1, 2, and 3 inventory was developed in accordance with Federal GHG Accounting and Reporting Guidance. Various initiatives will be taken in FY2013 to improve GHG accounting capability including improvements to data quality, inventory comprehensiveness, and integration of GHG accounting systems with existing EMS. TVA will communicate to internal and external stakeholders the objectives outlined in this SSPP as well as the measures that will be taken to meet those objectives. This communication will take place in a transparent, easy-to-understand format on the TVA Web site and in published annual reports. TVA also will communicate anticipated impacts of TVA actions on stakeholders and will include opportunities for stakeholders to participate in programs that improve sustainable performance.	TVA SSPP pp.16, 18, 19, 24	TVA personnel did not supply documentation showing compliance with [EPA MGGRR] which states "Facilities and suppliers of fossil fuels or industrial GHGs that emit more than 25,000 metric tons of CO_2 emissions per year must report their emissions by March 31, 2011, for 2010 emissions. Reports submitted annually thereafter." In reference to the gap, TVA personnel indicated the EPA MGGRR has more to do with the power system and is outside the scope of the executive order.
Building Energy	Reduce energy intensity in buildings to achieve GHG reductions. [§2(a)(i)]	Reduce building energy intensity 3% annually through FY 2015, or 30% total reduction by FY 2015 (baseline FY 2003). [§2(a)]	[EISA §431]: Reduce building energy intensity 3% annually through 2015, or 30% total reduction by 2015 (baseline 2003).	TVA is using almost half the energy of the federal average for goal-subject buildings. TVA is on track for 30 percent reduction by 2015.	TVA SSPP pp. 21, 37	No Gap Identified.
Renewable Energy Consumption	Increase use of renewable energy. [§2(a)(ii)]	Ensure that 50% of statutorily required renewables comes from "new" (as of 1999) sources. [§2(b)]	[EPAct 2005 §203]: Defines renewable energy." [EPAct 2005 §203]: Increase renewables 3% in FY2007-2009; increasing to 5% in FY 2010-2012; and increasing to 7.5% in FY 2013 and beyond. [EISA §523]: 30% of hot water demand in new Federal buildings and major renovations must be met with solar hot water if life-cycle cost effective.	TVA created the Green Power Providers program to contribute to TVA's renewable portfolio and encourage continued development of distributed renewable generation across the region. TVA status shows 4.5 percent new renewable in FY2010 and 90 percent in FY2011. TVA ended FY2011 with an agency renewable energy percentage of 8.4 percent, which exceeds the FY2011 goal of 5 percent and the FY2013 goal of 7.5 percent. According to TVA personnel, TVA has already met the 7.5 percent goal through purchases of renewable energy credits for many of its buildings and the use of hydromodernization, which is generated and used on-site.	TVA SSPP pp. 3, 32, 68	TVA personnel did not supply documentation showing compliance with [EISA §523] which states "30 percent of hot water demand in new federal buildings and major renovations must be met with solar hot water if life-cycle cost effective."
Fleet Petroleum Use	Reduce fleet consumption of petroleum products 2% annually through end of FY 2020 (baseline FY 2005). [§2(a)(iii)(C)] Use low-GHG-emitting vehicles. [§2(a)(iii)(A)] Optimize number of vehicles in fleet. [§2(a)(iii)(B)]	Reduce vehicle petroleum consumption 2% annually through FY 2015, (baseline FY2005). [§2(g)] Achieve 10% increase in non-petroleum fuel consumption annually (baseline FY2005). [§2(g)] Use plug-in hybrids (PIH) when commercially available at a life-cycle cost reasonably comparable to non-PIH vehicles. [§2(g)]	[EISA §142]: Reduce vehicle petroleum reduction 20% by FY 2015 (baseline FY2005). [EISA §142]: Achieve 10% increase in non-petroleum fuel use annually by 2015 (baseline 2005). [EISA §246]: Install at least one renewable fuel pump at each Federal fleet fueling center by 2010. [EISA §141]: Federal agencies are prohibited from acquiring any light-duty motor vehicle or medium-duty passenger vehicle that is not a "low greenhouse gas-emitting vehicle." Alternatively, an agency may demonstrate that it has adopted cost-effective policies to reduce petroleum consumption to achieve a comparable reduction in GHGs. [EPAct 2005 §701]: Dual-fueled vehicles to be operated on alternative fuel unless waivered.	TVA's vehicle fleet has been historically excluded from past requirements due to the nature of its make-up and use and its connection to the operation and maintenance of the TVA power system. TVA will continue to strive to reduce petroleum use and increase alternative fuel use in fleet vehicles. TVA will also strive to optimize use of vehicles and right-size its fleet. TVA is working with DOE to establish baseline date for applicable AFV vehicles and fleet optimization. Progress is expected to continue, subject to budget approval and constraints. TVA Fleet Manager will develop a coordinated plan to decrease the light-duty fleet size by FY2015. TVA, in the January 2012 OMB Scorecard on Sustainability/Energy, is in "Red" status stating "reduction in fleet petroleum use compared to 2005: 8.1% increase and not on track." A "Red" status indicates TVA "did not achieve at least 10 percent reduction in petroleum use in its entire vehicle fleet since 2005." In addition, commentary states "TVA's vehicle fleet has been historically excluded from past requirements due to the nature of its make-up, use, and its connection to "the operation and maintenance of the TVA power system." Going forward, TVA has agreed to apply the petroleum reduction goal and alternative fuel requirements to its light duty vehicles. TVA is beginning data adjustments to establish an official baseline toward facilitating a fleet strategy to meet the goals. The petroleum use reduction (percent reduction from FY2005 base year) TVA indicates that it is not on track and "TVA and GSA are beginning data adjustments in FAST to establish an official FY 2005 TVA baseline." TVA states that transition from petroleum to electricity can reduce transportation costs and may reduce GHG emissions, and make more efficient use of a variety of energy sources. TVA is on track for the number of executive fleet vehicles larger than a mid-size sedan or that do not comply with alternative fuel vehicle requirements. In addition, there is a decrease in the total number of TVA conventional vehicles. The alternative fuel use in the fleet has been increasing by more than 5 percent each year. Alternative fuel use in fleet (percent increase from FY2005 base year) ACTUAL. In addition, TVA has 471 alternative fuel vehicles. TVA lists a challenge as budget constraints: Acquiring hybrid electric vehicles through GSA at an affordable cost. The document does not contain analysis of the life cycle cost for a plug in hybrid to a regular commercial vehicle. According to TVA personnel, TVA vehicles are used primarily outside metropolitan statistical areas as described in EPAct92/05. Also, TVA has no central fueling facilities in metropolitan statistical areas. Further, as coordinated with DOE and OMB, TVA medium and heavy duty vehicles used in maintaining the reliable operation of the power system are within the intent of exemptions in EPAct92/05, such as emergency or off-road vehicles. Based on these facts, EPAct92/05 has significant application only to TVA's purchase of light-duty fleet vehicles. In addition, TVA personnel stated TVA's petroleum consumption, miles driven, and fleet size are trending downward. Also, the purchase of alternative fueled vehicles is on track, and the use of E85 has significantly increased.	TVA SSPP pp. 21-22, 24, 44-47, 69	No Gap Identified.
Renewable Energy Generation	Implement renewable energy generation projects on agency property. [§2(a)(ii)]	Implement new renewable energy generation projects on agency property for agency use. [§2(b)]	[EPAct 2005 §203]: Double count renewable energy produced on Federal or Indian lands and used on-site at Federal facilities.	TVA created the Green Power Providers program to contribute to TVA's renewable portfolio and encourage continued development of distributed renewable generation across the region.	TVA SSPP p. 68	TVA personnel did not supply documentation showing compliance with [EPAct 2005 §203] which states "Double count renewable energy produced on federal or Indian lands and used on-site at federal facilities."
Supply Chain GHG Emissions	Pursue opportunities with vendors and contractors to reduce GHG emissions. [§2(b)(i)]	[Indirect] In agency acquisition of goods and services, use of sustainable environmental practices, including energy-efficient products, is encouraged. [§2(d)]	[EISA §526]: Federal agencies are prohibited from procuring synfuel unless its life-cycle GHG emissions are less than those for conventional petroleum sources.	TVA launched the Sustainable Acquisition Working Subcommittee (SAWS) in FY2011 to support achieving TVA's sustainable acquisition goals by providing leadership, awareness, training, and communications. All TVA employees involved in purchasing are required to take green procurement training. TVA adopted the Electric Utility Industry Sustainable Supply Chain Alliance's (EUISSCA) best practices, standards, and metrics as part of TVA's Integrated Supply Chain Sustainability Strategy. TVA's on-going monitoring, analysis, and reporting led to establishment of appropriate targets to focused improvement efforts. TVA's involvement with Green Supplier Network (GSN), EUISSCA, and other initiatives enables TVA to better improve its environmental performance and sustainable business practices.	TVA SSPP pp. 59, 62	TVA personnel did not supply documentation showing compliance with [EISA §526] which states "Federal agencies are prohibited from procuring synfuel unless its life-cycle GHG emissions are less than those for conventional petroleum sources."
Scope 3 Emissions	Implement transit, travel, training, and conferencing strategies to support low-carbon commuting and travel. [§2(b)(ii)] Implement innovative policies to address scope 3 emissions unique to agency operations. [§2(b)(iv)]			In FY2011, TVA began upgrading its video and audio conferencing capabilities to reduce travel. Since 2001, employees and contractors have been reimbursed $65 monthly for participating in carpools. TVA implemented a car-sharing program at three corporate locations. TVA is providing leadership in the TVA Signature Technology area of electric vehicles and the infrastructure that supports them. TVA is working with EPRI, Oak Ridge National Laboratory, local power distributors, and regional stakeholders to develop fast, efficient stations where drivers can recharge their cars. TVA is involved in a multi-partner initiative — the EV Project — which is paving the way for the successful rollout of electric transportation across America. The transition from petroleum to electricity can reduce transportation costs and may reduce GHG emissions and make more efficient use of a variety of energy sources.	TVA SSPP pp. 25, 47, 69	No Gap Identified.
Potable Water Consumption	Reduce 2% annually potable water consumption intensity through FY2020 or 26% by the end of FY2020 (baseline FY 2007 water consumption). [§2(d)(i)]	Reduce water consumption intensity 2% annually through FY 2015 or 16% total reduction by the end of FY 2015 (baseline FY 2007). [§2(c)]		TVA set baseline potable water use in 2007. FY2010 reduction was 4.6 percent from baseline, and FY2011 reduction was 12 percent from baseline. TVA engineering managers are tasked with supporting water reuse projects. To date, TVA has identified projects, from covered facilities surveyed, with a potential water savings of 15.97 million gallons.	TVA SSPP pp. 48-52	No Gap Identified.

Tennessee Valley Authority
Office of the Inspector General
Gap Analysis

Goal / Target	Executive Order (E.O.) 13514	E.O. 13423	Existing Statute	Actions Referenced in TVA's Strategic Sustainability Performance Plan (SSPP), Supporting Documentation, and Discussion with TVA Policy and Oversight Personnel	Link to TVA's Strategic Sustainability Performance Plan (SSPP) and Climate Change Adaptation Plan (CCAP)	Gaps Resulting from Comparison of TVA Actions to Requirements and Directives
Industrial, Landscaping, and Agricultural Water Consumption	Reduce industrial, landscaping, and agricultural water consumption by 2% annually or 20% by the end of FY 2020 (baseline FY 2010 industrial, landscaping, and agricultural consumption). [§2(d)(ii)]	Reduce water consumption intensity 2% annually through FY 2015 or 16% total reduction by the end of FY 2015 (baseline FY 2007). [§2(c)]		TVA set baseline Industrial, Landscaping, and Agricultural Water consumption in 2010. FY2011 reduction was .8 percent from baseline. FY2011 goal was not met due to a project deferral; however TVA is planning to switch from wet-ash to dry-ash handling and, as a result, water savings will exceed goal. TVA on track to exceed overall goal. TVA engineering managers are tasked with supporting water reuse projects.	TVA SSPP pp. 48-52	No Gap Identified.
Water Reuse	Identify, promote, and implement water reuse strategies that reduce potable water consumption. [§2(d)(iii)]			TVA engineering managers are tasked with supporting water reuse projects. To date, TVA has identified projects, from covered facilities surveyed, with a potential water savings of 15.97 million gallons.	TVA SSPP pp. 48-52	No Gap Identified.
Stormwater Management	Achieve EPA's stormwater management objectives. [§2(d)(iv)]		[EISA §438]: Maintain or restore, for Federal properties over 5,000 square feet, the property's pre-development hydrology as to temperature, rate, volume, and duration of flow.	TVA currently meets federal, state, and local requirements for use of Best Management Practices in stormwater design and construction. TVA also incorporates National Environmental Policy Act (NEPA) compliance review in development of properties and maintains National Pollutant Discharge Elimination System (NPDES) permits for many sites.	TVA SSPP pp. 48, 51	No Gap Identified.
Pollution Prevention	Minimize generation of waste and pollutants through source reduction. [§2(e)(i)]	Maintain cost effective waste prevention and recycling programs. [§2(e)]		Currently, TVA plans to allocate one FTE to overseeing the planning and implementation of projects and programs to achieve Pollution Prevention and Waste Reduction targets. The FTE will utilize cross-organizational support and collaboration to achieve targets outlined in this plan and TVA's Sustainability Goals. However existing staff resources have limited availability due to priority workloads. TVA will need to consider future implementation strategies to achieve and maintain target diversion rates as well as the implementation of supporting projects. TVA will continue to minimize the generation of waste and pollutants through source reduction. Nearly 5 percent of TVA offices had a recycling program in FY2011 with plans to reach 50 percent by FY2015.	TVA SSPP pp. 53-54	No Gap Identified.
Solid Waste Diversion	Divert 50% of non-hazardous solid waste from disposal by the end of FY 2015. [§2(e)(ii)] Does not include diversion to waste-to-energy plants. [§7] Divert 50% of construction and demolition materials and debris from disposal by the end of FY 2015. [§2(e)(iii)]	Increase diversion of solid waste as appropriate. [§2(e)]	[Sites: Check state and local laws and regulations related to solid waste diversion.]	TVA has set FY2013 target to divert 16 percent of nonhazardous solid waste and 10 percent of construction and demolition waste in working toward the 50-percent diversion rate for FY2015. [See targets and actuals on p. 54 of the SSPP.]	TVA SSPP pp. 53-54	No Gap Identified.
Paper	Acquire uncoated printing and writing paper containing at least 30% postconsumer fiber. Reduce printing paper use. [§2(e)(iv)]	Use paper containing at least 30% postconsumer fiber content. [§2(d)]		TVA estimates 91-100 percent of paper purchased is at least 30 percent postconsumer fiber. TVA is also exploring the feasibility of implementing an agency-wide Paper Reduction Program to supplement TVA's "diet and exercise focus" by driving efficiencies and reducing waste and cost through four strategies: Reduce, Recycle, Rethink, and Reuse.	TVA SSPP pp. 55, 62	No Gap Identified.
Toxic Materials and Chemicals	Reduce and minimize the quantity of toxic and hazardous chemicals and materials acquired, used, and disposed by FY2015. [§2(e)(v)]	Reduce acquisition, use, and disposal of toxic materials and chemicals. [§2(e)]		TVA will work to integrate pest management and landscape practices to reduce and eliminate use of toxic and hazardous chemicals. TVA will continue reporting in accordance with the requirements of sections 303 through 313 of Emergency Planning and Community Right-to-Know Act (EPCRA) (42 U.S.C. 11001 et seq.). TVA has a non-public policy to address management of toxic/hazardous chemicals.	TVA SSPP pp. 53, 55	No Gap Identified.
Compostable and Organic Material	Increase diversion of compostable and organic material from waste streams. [§2(e)(vi)]			TVA will work to increase the diversion of compostable and organic materials from its waste stream. According to TVA personnel, TVA is currently evaluating source reduction opportunities for wood pallets, which will reduce organic material from the waste stream. Additionally, where feasible, wood pallets and scrap lumber are being recycled as a short-term resolution.	TVA SSPP p. 53	No Gap Identified.
Landscaping Management	Implement pest management and other landscaping management practices. [§2(e)(viii)]			TVA will work to integrate pest management and landscape practices to reduce and eliminate use of toxic and hazardous chemicals. TVA is in the planning phase for a policy related to CEQ Guidance on Sustainable Practices for Designed Landscapes. TVA reports pest management practices are not tracked. TVA has a non-public policy to address management of toxic/hazardous chemicals.	TVA SSPP pp. 53, 55	No Gap Identified.
Chemical Use	Increase use of acceptable alternative chemicals and processes. [2(e)(viii)] Decrease chemical use to assist in achieving GHG reduction targets. [§2(e)(ix)]	Reduce acquisition, use, and disposal of toxic materials and chemicals. [§2(e)]		TVA has a non-public policy to address management of toxic/hazardous chemicals. TVA will work to implement integrated pest management and landscape management practices to reduce and eliminate the use of toxic and hazardous chemicals and materials.	TVA SSPP pp. 53, 55	TVA personnel did not supply documentation showing compliance with E.O. 13514 [2(e)(viii)] which states "Increase use of acceptable alternative chemicals and processes."
Sustainable Communities	Participate in regional transportation planning and recognize existing community transportation infrastructure. [§2(f)(i)] Align Federal policies to increase the effectiveness of local planning for energy choices such as locally-generated renewable energy. [§2(f)(ii)] Ensure planning for new facilities/leases considers pedestrian-friendly sites near existing employment centers and accessible to public transit. [§2(f)(iii)] Identify and analyze impacts from energy use and alternative energy sources in EAs and EISs for new or expanded facilities. [§2(f)(iv)] Coordinate with regional programs for Federal, tribal, state, and local ecosystem, watershed, and environmental management. [§2(f)(v)]			To fully support the current leveraged resources, an additional 0.4 positions are needed to expand existing review of transportation plans prepared by municipal or rural planning organizations in TVA-served states other than Tennessee and North Carolina. TVA created the Green Power Providers program to contribute to TVA's renewable portfolio and encourage continued development of distributed renewable generation across the region. TVA does not build very many new buildings but has started preliminary design on some where TVA is working with the A/E firms to incorporate the Sustainable Guiding Principles (SGPs) and work towards the most efficient design. TVA's policies and guidance are in alignment with the regional and local planning goals. Additionally under NEPA, TVA coordinates and/or consults with federal, state, and local agencies and tribes for actions that potentially affect their trust resources. Agencies frequently involved in these efforts include State Historic Preservation Officers, U.S. Fish and Wildlife Service, state environmental regulators, local development districts, and Native American tribes. The Tennessee Healthy Watershed Initiative (THWI) is a collaboration of federal, state, and nonprofit organizations committed to maintain and improve water resources in Tennessee watersheds. THWI provides a forum for communication, collaboration, and thoughtful planning among a broad partnership of agencies and interests and is coordinating implementation of protection and improvement efforts for Tennessee's waters. TVA's active engagement in THWI also serves as a pilot to determine its potential as a platform for the Aquatic Ecology Management Program in TVA's Natural Resource Plan (NRP). Also, TVA's Climate Change Sentinel Monitoring is an NRP program whose focus is on understanding the potential climate change effects on Tennessee Valley streams and their unique biodiversity. Coordination across federal, state, tribal, or other partners is appropriate and critical to advance this action. Planning is occurring during FY2012 and monitoring will begin in FY2013 in the five predominant ecoregions, with ten sites a year. The Strategic Planning Partnership focuses on building strong partnerships with state and other federal agencies and with regional nongovernmental organizations to address stewardship issues of mutual importance and drive measurable improvement of health of the region's waters. The Water Resource Outreach Program focuses on increasing public awareness and involvement through the promotion of water resource protection and improvement best practices.	TVA SSPP pp. 31-32, 41-43, 68 TVA CCAP pp. 14-15	No Gap Identified.
Energy Efficiency in New Construction and Major Renovations	Achieve by 2030 zero-net-energy in buildings entering the planning process after 2020. [§2(g)(i)]		[EPAct 2005 §109]: Achieve energy performance 30% beyond ASHRAE 90.1-2004. [EISA §433]: New Federal buildings and Federal buildings undergoing major renovations shall reduce their fossil fuel-generated energy consumption (baseline 2003) by 55% (2010), 65% (2015), 80% (2020), 90% (2025), and 100% (2030).	TVA does not build very many new buildings but has started preliminary design on some, where TVA is working with the A/E firms to incorporate the SGPs and work towards the most efficient design. TVA will continue to review all new building designs and major renovations for incorporation of the SGPs and work toward retrofitting the SGPs into 15% of its greater than 5,000 square feet buildings by FY 2015. TVA has continued to apply the Sustainable Guiding Principles to its two largest office buildings; the Knoxville Office Complex (KOC) and the Chattanooga Office Complex (COC). Together these two buildings represent 21% of TVA goal subject buildings (as defined by EPAct05) using square footage accounting. To date, 46% of the Sustainable Guiding Principle requirements have been completed in the COC and 61% have been completed in the COC. If TVA could receive partial credit for this work the agency would be at 8.1% towards the 15% by FY 2015 requirement, taking into account that these two buildings represent 21% of total building square footage subject to this E.O. requirement, but to date there has been no avenue to obtain partial credit through FRPP reporting. TVA has turned its attention to retrofitting multiple smaller buildings with the SGPs due to the OMB rule change that emphasized numbers of building reporting verses square footage reporting. This change has "reduced" TVA's progress toward the associated goal due to its previous focus on the largest office buildings. According to TVA personnel, 3 have been completed and 6 more are planned to be completed by 6/30/2013.	TVA SSPP pp. 4, 31, 36, 41	TVA personnel did not supply documentation showing compliance with [EPAct 2005 §109] which states "Achieve energy performance 30 percent beyond ASHRAE 90.1-2004."

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Goal / Target	Executive Order (E.O.) 13514	E.O. 13423	Existing Statute	Actions Referenced in TVA's Strategic Sustainability Performance Plan (SSPP), Supporting Documentation, and Discussion with TVA Policy and Oversight Personnel	Link to TVA's Strategic Sustainability Performance Plan (SSPP) and Climate Change Adaptation Plan (CCAP)	Gaps Resulting from Comparison of TVA Actions to Requirements and Directives
High Performance Sustainable Buildings	Ensure all new construction, major renovation, or repair and alteration complies with the Guiding Principles. [§2(g)(ii)] Ensure 15% of existing facilities and building leases (above 5,000 gross square feet) meet the Guiding Principles by FY2015. [§2(g)(iii)] Make annual progress towards 100% conformance with the Guiding Principles. [§2(g)(iii)]	Ensure all new agency construction and renovation complies with the Guiding Principles. [§2-f)] Ensure 15% of existing Federal building inventory incorporate the Guiding Principles by 2015. [§2(f")]	[EISA §433]: Requires sustainable design principles be applied to the siting, design, and construction of buildings subject to the standards. [EISA §434]: Ensure major replacements of installed equipment, renovation, or expansion of existing space employ the most energy-efficient designs, systems, equipment, and controls life-cycle cost effective. [EISA §435]: As of December 19, 2010, Federal agencies are prohibited from leasing buildings that have not earned the ENERGY STAR® label (some exemptions apply). [EPAct 2005 §109]: Includes application of sustainable design principles for new buildings.	TVA does not build very many new buildings but has started preliminary design on some where TVA is working with the A/E firms to incorporate the SGPs and work towards the most efficient design. TVA will continue to review all new building designs and major renovations for incorporation of the SGPs and work toward retrofitting the SGPs into 15 percent of its greater than 5,000-square-feet buildings by FY2015. The majority of the new buildings that are built are to support operations at its power plant sites, removing from consideration siting decisions based on regional/local planning, existing public transportation, home locations of employees, etc. However, such buildings are being designed to incorporate the Sustainable Guiding Principles. TVA has completed SGP evaluations on 36 smaller buildings. According to TVA personnel, they have also completed construction modifications on 12 of them.	TVA SSPP pp. 31, 40-41	TVA self-identifies this as a problem area, and the targets are not being met at this point for the 15-percent goal for all existing facilities by FY2015. TVA personnel did not supply documentation showing compliance with [EISA §435] which states "As of December 19, 2010, federal agencies are prohibited from leasing buildings that have not earned the ENERGY STAR® label (some exemptions apply)."
Advanced Metering and Measurement			[EPAct 2005 §103]: Federal buildings must be metered by October 1, 2012, with data provided at least daily and electricity consumption measured hourly. [EISA §432]: Identify "covered facilities" constituting at least 75% of the agency's facility energy use. Each covered facility must have an energy manager designated and meet additional requirements. Energy and water evaluations must be completed every 4 years for each facility. Facility energy managers are also responsible for commissioning equipment and establishing O&M plans for measuring, verifying, and reporting energy and water savings. [EISA §434(b)]: By October 16, 2016, each agency shall provide for equivalent metering of natural gas and steam.	TVA recognizes one of the challenges as metering and nuclear plant sites and elaborates by stating "Six of the remaining smart meters TVA has plans to install are on buildings located at TVA nuclear plant sites. Trying to obtain outages to install these has been difficult since an outage impacts nuclear plant operations." TVA indicates 95.5 percent of appropriate buildings were metered for electricity. TVA successfully benchmarked its metered buildings where possible. TVA's covered facility list includes 54 buildings, of which 14 of the buildings are metered. Of the 14 buildings, only 8 buildings were benchmarked due to 2 buildings having incomplete smart meter data and 4 buildings not having correct space types available to properly benchmark the buildings. The remaining 40 buildings that are not metered are located at plant sites where it is not possible to separate the energy used to generate, transmit, and control electricity from the building energy usage. As of FY2011, 100 percent of facilities had an energy manager designated. TVA continues to evaluate facilities to identify potential ECMs as required by EPAct05 and EISA 2007. During FY2011, TVA surveyed 9 covered facilities accounting for 4,434,600 square feet. In FY 011, TVA implemented $7.9M worth of energy improvements resulting in $515,900 in annual savings and 10,260 MWh in energy consumption savings at both covered and non-covered facilities." TVA plans to demonstrate use of cost-effective and innovative building strategies to minimize energy, water, and materials consumption is in planning. According to TVA personnel, of 40 planned meters, 38 have been completed to date bringing TVA standard and advanced metering to 98.7 percent. TVA personnel also stated they are completing energy and water evaluations and that EISA §434(b) does not apply to TVA.	TVA SSPP pp. 33, 36-37, 41	No Gaps Identified.
Green Roofs	Minimize consumption of energy, water, and materials through cost-effective, innovative strategies, such as highly reflective and vegetated roofs. [§2(g)(iv)]			TVA's SSPP states that cost-effective, innovative building strategies to minimize energy, water, and material consumption are in planning.	TVA SSPP p. 41	No Gaps Identified.
Building Portfolio Management	Manage existing building systems to reduce consumption of energy, water, and materials. [§2(g)(v)] Identify alternatives to renovation that reduce existing asset deferred maintenance costs. [§2(g)(v)] Identify opportunities to consolidate and dispose of existing assets, optimize real property portfolio performance, and reduce environmental impacts. [§2(g)(vi)]			In 2001, TVA developed and implemented the TVA SFP as a result of an increased portfolio of vacant space. The plan was presented and approved by the TVA Board of Directors in 2001 and received an achievement award in the "Asset Management" category for "Real Property Innovation" in 2003 from the General Services Administration. Results of the plan include a reduction from 3.5 million square feet to the current level of 2.5 million square feet, removal of approximately 100 buildings from the TVA corporate portfolio, a cumulative savings of over $64M over 10 years, and a greater alignment with the TVA business plan and corporate strategic plan. An on-going integral component of the SFP is to determine "core" versus "non-core" buildings in order to eliminate nonessential spending on buildings that are no longer necessary for TVA to achieve its mission or demand an exceptional investment in order to remain operational. If a building is determined to be core, operational and capital dollars are allotted for maintenance and improvements. In addition, a core building is considered for the FAP Program, which allocates dollars for capital improvements to building envelopes and systems for core properties. The existing TVA Facilities Asset Preservation (FAP) Program addresses deferred maintenance needs across TVA. The FAP Program goal is to have all important facility assets in good or better condition and included in a routine preventive maintenance program with minimum backlog. The FAP Program achieves this goal using an approach that focuses available resources first on facility assets with the greatest need for repair and importance to the TVA Mission. Additionally, this approach focuses resources first on maintenance items in Failed Concition, then on those in Poor Condition, and those in Fair Condition, with the potential of extending their economic life. Through the FAP program, TVA continues to reduce its deferred maintenance backlog. The program was started in the early 2000s.	TVA SSPP pp. 13-14, 31, 37	No Gaps Identified.
Historic Buildings	Promote long-term viability of agency-owned historic buildings by ensuring that rehabilitation utilizes best practices and technologies in retrofitting. [§2(g)(vii)]			TVA is developing a database of historic properties that should be completed by mid FY2013 at the latest. Staffing a preservation planner, historic architect, or architectural historian at 1 to 1.5 FTEs would likely be helpful in meeting the requirements that TVA has from the National Historic Preservation Act (NHPA) (specifically, Section 110) – or at least offer more of an opportunity for awareness during planning.	TVA SSPP p. 42	No Gaps Identified.
Sustainable Acquisition	Ensure 95% of new contract actions for products and services are: • Energy efficient • Water efficient • Biobased-content • Environmentally preferable • Non-ozone depleting • Recycled- content • Non-toxic or less-toxic than alternatives [§2[h][i)]	Purchase products that are: • Recycled • Biopreferred • ENERGY STAR • FEMP designated • EPEAT • WaterSense (and other water-efficient) [§2(d)]	[EPAct 2005 §104]: Requires Federal agencies to incorporate energy efficiency criteria consistent with ENERGY STAR and FEMP designated products for all procurements involving energy-consuming products and services. [EISA §525]: Requires procurement to focus on ENERGY STAR and FEMP designated products. [EISA §524]: Encourages agencies to minimize standby energy use in purchases of energy-using equipment. NOTE: Preferences in RCRA 6002, FSRIA 9002, and EPCRA not included.	Although E.O. 13514 and 13423 are limited to procurements funded with appropriated funds and TVA's acquisitions are made with non-appropriated funds, TVA intends to implement the sustainable acquisition provisions to the extent TVA deems practicable. TVA launched the SAWS in FY2011 to provide support in achieving TVA's sustainable acquisition goals by providing leadership, awareness, training, and communications. All TVA employees and suppliers are fully engaged to support the success of this goal. Sustainable Acquisition is not merely a "Supply Chain Issue." All TVA employees and Key Suppliers have a role in supporting the successful implementation of TVA's Sustainable Acquisition mission. TVA customized the Green Products List of required green products to better serve as a more user-friendly resource for employees and contractors. As a result of the correction plan, TVA achieved 95 percent compliance for FY2011 Q4. TVA adopted the Electric Utility Industry Sustainable Supply Chain Alliance's (EUISSCA) best practices, standards, and metrics as part of TVA's Integrated Supply Chain Sustainability Strategy. TVA's on-going monitoring, analysis, and reporting led to establishment of appropriate targets to focused improvement efforts, TVA's involvement with Green Supplier Network (GSN), EUISSCA, and other initiatives enables TVA to better improve its environmental performance and sustainable business practices. As a corporate sponsor for GSN, TVA is working to sponsor suppliers annually to participate in GSN's on-site Lean and Clean Reviews designed to help suppliers improve environmental performance and sustainable business practices while supporting TVA's prioritie s of improving efficiency, performance, and reducing costs.	TVA SSPP pp. 59, 62	No Gaps Identified.

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Goal / Target	Executive Order (E.O.) 13514	E.O. 13423	Existing Statute	Actions Referenced in TVA's Strategic Sustainability Performance Plan (SSPP), Supporting Documentation, and Discussion with TVA Policy and Oversight Personnel	Link to TVA's Strategic Sustainability Performance Plan (SSPP) and Climate Change Adaptation Plan (CCAP)	Gaps Resulting from Comparison of TVA Actions to Requirements and Directives
Electronics Stewardship	Ensure procurement preference for EPEAT-registered electronic products. [§2(i)(i)] Enable power management, duplex printing, and other energy-efficient or environmentally preferable features on all eligible DOE electronic products. [§2(i)(ii)] Employ environmentally sound disposition of excess or surplus electronic products. [§2(i)(iii)] Ensure procurement of ENERGY STAR and FEMP designated electronic equipment. [§2(i)(iv)] Implement best management practices in energy efficient management of servers and Federal data centers. [§2(i)(v)]	Ensure that 95% of agency electronic product acquisitions are EPEAT registered. [§2(h)] Enable the ENERGY STAR feature on agency computers and monitors. (§2(h)) Establish and implement policies to extend the useful life of agency electronic equipment. (§2(h)) Use environmentally sound disposal practices for electronics. (§2(h))	[EISA §431]: Reduce building energy intensity 3% annually through 2015, or 30% total reduction by 2015 (baseline 2003).	Many of the electronics stewardship efforts, as well as data center improvements, are long-standing TVA initiatives and use leveraged resources. TVA is using almost half the energy of the federal average for goal-subject buildings. TVA is on track for 30 percent reduction by 2015. In FY2011, TVA achieved a 99.7 percent EPEAT Purchase Rate. In 2004, TVA was an Early Adopter of Automated Enterprise Monitor Power Management. TVA collected and properly disposed of over 27 pallets of unused TVA-owned technology assets from employees and staff. In FY2011, 99 percent of electronic acquisitions were FEMP-designated and Energy Star qualified. In FY2011, 60 percent of PCs, laptops, etc., had power management actively implemented. In FY2011, 100 percent of printing products had duplex features in use. According to TVA, -- TVA and EPRI are partnering in the National Energy Efficiency Demonstration, a field demonstration of six categories of "hyper-efficient" technologies to fundamentally change energy usage in U.S. buildings and homes. The six categories include: Variable Refrigerant Flow Air Conditioning, Efficient Data Centers, LED Street and Area lighting, Heat Pump Water Heaters, Ductless Residential Heat Pumps and Air Conditioners, and Hyper-Efficient Residential Appliances. The technologies are being demonstrated with several utilities in different climate regions to assess their performance when deployed in diverse environments. TVA implements server technology that reduces the quantity of servers required, and the energy needs for the servers that are required. TVA uses server virtualization to operate 1204 virtual servers on 175 physical hosts, a net reduction/avoidance of 1028 servers. In virtualization, a single physical server is partitioned into multiple logical constructs that operate as independent servers while sharing the resources of the partitioned server. When a physical server is required, the TVA standard server is based on a blade server architecture where blade enclosure and rack space is available (otherwise low/power DL360s are used). This blade server architecture requires less power and generates less heat than traditional server architectures. Blades are standard for Windows and Linux servers. New physical arrangements of the blades in the data center have resulted in a total load reduction of more than 333kW in the Chattanooga Data Center.	TVA SSPP pp. 21, 37, 64-66	No Gaps Identified.
Environmental Management Systems	Continue implementation of EMSs; ensure they are maintained to achieve the goals of the E.O. [§2(j)]	Implement EMSs to support goals of E.O. [§3(b)] [See also CEQ Instructions 3/28/2007]		TVA will use its redeployed EMS to identify high priority environmental sustainability projects and in conjunction with its business planning process to consider environmental sustainability in all projects implemented at TVA. TVA plans to establish environmental program objectives and targets for each of the E.O. 13514 goals as a part of the TVA EMS planning process. Progress toward achieving the objectives and targets will be tracked using the EMS and performance monitoring and reporting processes and will be communicated using existing internal reports.	TVA SSPP pp. 7, 10	No Gaps Identified.
Better Buildings Challenge				TVA, as a provider of utility-based Energy Savings Performance Contracts, will continue to finance its own upgrades. Over the next 24-month period, TVA plans on investing $17M in energy, water, and sustainable projects through its own implementation process identified in the "ESPC Plan" dated January 31, 2012. TVA, as a provider of utility-based Energy Savings Performance Contracts (ESPC), is self-funding the work. Over the 24-month period ending on December 31, 2013, TVA plans on investing $17M in energy, water, and sustainable projects through its own implementation process. TVA is currently tracking its progress towards meeting the $17M Energy Savings Performance Contract (ESPC) Challenge in two ways. The first way TVA is tracking its progress in meeting the ESPC Challenge is through the OMB Max Web site. Each month on the 15th of each month, TVA is required to update its progress in meeting the Energy Savings Performance Contract (ESPC) Challenge on the OMB Max Web site. (To access the Web site, you must register on the OMB Max Web site). On the OMB Max Web site, the investment amounts are represented on the budget level for energy, water, and sustainable projects. TVA funds these projects through two funding sources, which are Energy Efficiency and Demand Response (EEDR) in Policy and Oversight (PO) and Facilities Management (FM) in Property and Natural Resources (P&NR). TVA is currently on track to meet its set milestones for the remaining $7.8M that is to be awarded for projects in FY2013. The second way TVA is tracking its progress in meeting the ESPC Challenge is through the FEMP created EISA 432 Compliance Tracking System (CTS), which tracks completed project information in addition to other required reporting. TVA currently has 38 energy, water, and sustainable projects for FY2012 totaling $10,768,491 dollars listed in CTS that applies towards the ESPC goal. This amount exceeds the $9.2M goal for FY2012.	TVA SSPP p. 39	No Gaps Identified.

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This Addendum addresses the gaps previously identified in Appendix A TVA-OIG Gap Analysis submitted on March 29, 2013.

Goal / Target	Executive Order (E.O.) 13514	E.O. 13423	Existing Statute	Actions Referenced in TVA's Strategic Sustainability Performance Plan (SSPP), Supporting Documentation, and Discussion with TVA Policy and Oversight Personnel	Link to TVA's Strategic Sustainability Performance Plan (SSPP) and Climate Change Adaptation Plan (CCAP)	TVA Comments, Actions, and Plans to Address Potential Gaps in Meeting Requirements and Directives
GHG Emission Reporting	Report comprehensive GHG emission inventory for FY 2010 by January 5, 2011, and annually thereafter by the end of January. [§2(c)]		[EISA §527]: Each federal agency must issue an annual report that describes the status of initiatives to improve energy efficiency, reduce energy costs, and reduce GHG emissions. [EPA MGGRR]: Facilities and suppliers of fossil fuels or industrial GHGs that emit more than 25,000 metric tons of CO_2e emissions per year must report their emissions by March 31, 2011, for 2010 emissions. Reports submitted annually thereafter.	TVA will report Scopes 1, 2, and 3 GHG emissions in baseline year and annually thereafter. The scopes 1, 2, and 3 inventory was developed in accordance with federal GHG Accounting and Reporting Guidance. Various initiatives will be taken in FY2013 to improve GHG accounting capability including improvements to data quality, inventory comprehensiveness, and integration of GHG accounting systems with existing EMS. TVA will communicate to internal and external stakeholders the objectives outlined in this SSPP as well as the measures that will be taken to meet those objectives. This communication will take place in a transparent, easy-to-understand format on the TVA Web site and in published annual reports. TVA also will communicate anticipated impacts of TVA actions on stakeholders and will include opportunities for stakeholders to participate in programs that improve sustainable performance.	TVA SSPP pp.16, 18, 19, 24	With regard to [EPA MGGRR], TVA has complied with reporting all its GHG emissions in the required inventory, both targeted and nontargeted (TVA Power System – which is excluded by EO 13514). TVA's Annual Energy Management Data Report lists both. The power system emissions are the same as reported to EPA and include all sources emitting more than 25,000 metric tons of CO2 per year. In the GHG Inventory reported with the Annual Energy Management Report (provided as Appendix T - TVA Annual GHG Sustainability Data Report), this power system amount is reported in a footnote on tab "3.2 SCOPE 1 FEMP GS & GE Energy." It is purposely not listed in a cell, so it does not automatically get rolled up with the rest of the federal accounting. It is outside the scope of EO 13514 which states: "Where appropriate, the target shall exclude direct emissions from excluded vehicles and equipment and from electric power produced and sold commercially to other parties in the course of regular business."
Renewable Energy Consumption	Increase use of renewable energy. [§2(a)(ii)]	Ensure that 50% of statutorily required renewables comes from "new" (as of 1999) sources. [§2(b)]	[EPAct 2005 §203]: Defines renewable energy." [EPAct 2005 §203]: Increase renewables 3% in FY2007-2009; increasing to 5% in FY 2010-2012; and increasing to 7.5% in FY 2013 and beyond. [EISA §523]: 30% of hot water demand in new federal buildings and major renovations must be met with solar hot water if life-cycle cost effective.	TVA created the Green Power Providers program to contribute to TVA's renewable portfolio and to encourage continued development of distributed renewable generation across the region. TVA status shows 46 percent new renewable in FY2010 and 90 percent in FY2011. TVA ended FY2011 with an agency renewable energy percentage of 8.4 percent, which exceeds the FY2011 goal of 5 percent and the FY2013 goal of 7.5 percent. According to TVA personnel, TVA has already met the 7.5 percent goal through purchases of renewable energy credits for many of its buildings and the use of hydromodernization, which is generated and used on-site.	TVA SSPP pp. 3, 32, 68	With regard to [EISA §523], TVA reviews solar hot water systems as part of its EISA Energy/Water surveys and Sustainable Guiding Principle building evaluations. To date, TVA has not found any solar hot water recommendations that have been life-cycle cost effective. Supporting survey and evaluation reports were provided for internal review.
Renewable Energy Generation	Implement renewable energy generation projects on agency property. [§2(a)(ii)]	Implement new renewable energy generation projects on agency property for agency use. [§2(b)]	[EPAct 2005 §203]: Double count renewable energy produced on federal or Indian lands and used on-site at Federal facilities.	TVA created the Green Power Providers program to contribute to TVA's renewable portfolio and to encourage continued development of distributed renewable generation across the region.	TVA SSPP p. 68	With regard to [EPAct 2005 §203], TVA's GHG Inventory (provided as Appendix T), tab 2.2, Renewable Energy Data, column H, identifies whether the project is on or adjacent to federal or Indian land, which impacts transmission losses, qualification for the EPAct bonus, and whether a green power purchase counts toward an agency's energy intensity goal.
Supply Chain GHG Emissions	Pursue opportunities with vendors and contractors to reduce GHG emissions. [§2(b)(i)]	[Indirect] In agency acquisition of goods and services, use of sustainable environmental practices, including energy-efficient products, is encouraged. [§2(d)]	[EISA §526]: Federal agencies are prohibited from procuring an alternative or synthetic fuel for any mobility-related use, unless the contract specifies that its life-cycle GHG emissions must be, on an ongoing basis, less than or equal to such emissions from the fuel produced from conventional petroleum sources.	TVA launched the Sustainable Acquisition Working Subcommittee (SAWS) in FY2011 to support achieving TVA's sustainable acquisition goals by providing leadership, awareness, training, and communications. All TVA employees involved in purchasing are required to take green procurement training. TVA adopted the Electric Utility Industry Sustainable Supply Chain Alliance's (EUISSCA) best practices, standards, and metrics as part of TVA's Integrated Supply Chain Sustainability Strategy. TVA's on-going monitoring, analysis, and reporting led to establishment of appropriate targets to focused improvement efforts. TVA's involvement with Green Supplier Network (GSN), EUISSCA, and other initiatives enables TVA to better improve its environmental performance and sustainable business practices.	TVA SSPP pp. 59, 62	With regard to [EISA §526], TVA does not purchase alternative fuels for transportation via contract; therefore, this provision is not applicable. TVA alternative fuel purchases, such as E85, are made at the pump by individual drivers, thus not under a bulk purchase contract.
Chemical Use	Increase use of acceptable alternative chemicals and processes. [2(e)(viii)] Decrease chemical use to assist in achieving GHG reduction targets. [§2(e)(ix)]	Reduce acquisition, use, and disposal of toxic materials and chemicals. [§2(e)]		TVA has a non-public policy to address management of toxic/hazardous chemicals. TVA will work to implement integrated pest management and landscape management practices to reduce and eliminate the use of toxic and hazardous chemicals and materials.	TVA SSPP pp. 53, 55	With regard to E.O. 13514 [2(e)(viii)], TVA has Environmental Management Procedures in place for Hazardous Materials Management (Shipping, Chemical Traffic Control, and SARA Tier II Reporting). The TVA Nuclear Power Group also follows NPG-SPP-05.4, Chemical Traffic Control, which establishes the requirements to control chemicals, expendable products, and hazardous materials used at nuclear power plants. Additionally, the TVA Sustainable Acquisition Procedure (TVA SPP 05.22) establishes TVA-wide requirements to increase the use of acceptable alternative chemicals and processes (non-toxic or less toxic alternatives), where such products and services meet agency performance requirements and are life-cycle cost effective and available.
Energy Efficiency in New Construction and Major Renovations	Achieve by 2030 zero-net-energy in buildings entering the planning process after 2020. [§2(g)(i)]		[EPAct 2005 §109]: Achieve energy performance 30% beyond ASHRAE 90.1-2004. [EISA §433]: New Federal buildings and Federal buildings undergoing major renovations shall reduce their fossil fuel-generated energy consumption (baseline 2003) by 55% (2010), 65% (2015), 80% (2020), 90% (2025), and 100% (2030).	TVA does not build very many new buildings but has started preliminary design on some, where TVA is working with the A/E firms to incorporate the SGPs and work towards the most efficient design. TVA will continue to review all new building designs and major renovations for incorporation of the SGPs and work toward retrofitting the SGPs into 15% of its greater than 5,000 square feet buildings by FY 2015. TVA has continued to apply the Sustainable Guiding Principles to its two largest office buildings; the Knoxville Office Complex (KOC) and the Chattanooga Office Complex (COC). Together these two buildings represent 21% of TVA goal subject buildings (as defined by EPAct05) using square footage accounting. To date, 46% of the Sustainable Guiding Principle requirements have been completed in the KOC and 61% have been completed in the COC. If TVA could receive partial credit for this work the agency would be at 8.1% towards the 15% by FY 2015 requirement, taking into account that these two buildings represent 21% of total building square footage subject to this E.O. requirement, but to date there has been no avenue to obtain partial credit through FRPP reporting. TVA has turned its attention to retrofitting multiple smaller buildings with the SGPs due to the OMB rule change that emphasized numbers of building reporting verses square footage reporting. This change has "reduced" TVA's progress toward the associated goal due to its previous focus on the largest office buildings. According to TVA personnel, 3 have been completed and 6 more are planned to be completed by 6/30/2013.	TVA SSPP pp. 4, 31, 36, 41	With regard to [EPAct 2005 §109], TVA's GHG Inventory (provided as Appendix T), tab 4.2, New Building Designs, identifies the new building designs started since FY2007 and their energy efficiency compared to ASHRAE 90.1 standards. In addition, the Annual Energy Management Report provided as Appendix N, sections D and E (pages 31 through 34), discusses TVA's strategies to achieve energy efficient buildings and the ASHRAE 90.1 requirements for new building designs.

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Appendix A Addendum to the TVA-OIG Gap Analysis

Goal / Target	Executive Order (E.O.) 13514	E.O. 13423	Existing Statute	Actions Referenced in TVA's Strategic Sustainability Performance Plan (SSPP), Supporting Documentation, and Discussion with TVA Policy and Oversight Personnel	Link to TVA's Strategic Sustainability Performance Plan (SSPP) and Climate Change Adaptation Plan (CCAP)	TVA Comments, Actions, and Plans to Address Potential Gaps in Meeting Requirements and Directives
High Performance Sustainable Buildings	Ensure all new construction, major renovation, or repair and alteration complies with the Guiding Principles. [§2(g)(ii)] Ensure 15% of existing facilities and building leases (above 5,000 gross square feet) meet the Guiding Principles by FY2015. [§2(g)(iii)] Make annual progress towards 100% conformance with the Guiding Principles. [§2(g)(iii)]	Ensure all new agency construction and renovation complies with the Guiding Principles. [§2(f)] Ensure 15% of existing federal building inventory incorporate the Guiding Principles by 2015. [§2(f)]	[EISA §433]: Requires sustainable design principles be applied to the siting, design, and construction of buildings subject to the standards. [EISA §434]: Ensure major replacements of installed equipment, renovation, or expansion of existing space employ the most energy-efficient designs, systems, equipment, and controls life-cycle cost effective. [EISA §435]: As of December 19, 2010, federal agencies are prohibited from leasing buildings that have not earned the ENERGY STAR® label (some exemptions apply). [EPAct 2005 §109]: Includes application of sustainable design principles for new buildings.	TVA does not build very many new buildings but has started preliminary design on some where TVA is working with the A/E firms to incorporate the SGPs and work towards the most efficient design. TVA will continue to review all new building designs and major renovations for incorporation of the SGPs and work toward retrofitting the SGPs into 15 percent of its greater than 5,000-square-feet buildings by FY2015. The majority of the new buildings that are built are to support operations at its power plant sites, removing from consideration siting decisions based on regional/local planning, existing public transportation, home locations of employees, etc. However, such buildings are being designed to incorporate the Sustainable Guiding Principles. TVA has completed SGP evaluations on 36 smaller buildings. According to TVA personnel, they have also completed construction modifications on 12 of them.	TVA SSPP pp. 31, 40-41	TVA self-identifies this as a problem area, and the targets are not being met at this point for the 15-percent goal for all existing facilities by FY2015. As described in Appendix N on page 33, completion-to-date of SGF requirements in TVA's two largest office buildings represents 9.3 percent of the 15-percent goal. The report also identifies 31 design evaluations on smaller buildings and the 12 buildings with completed modifications. With regard to [EISA §435], the annual report in Appendix N, pages 22 and 24, discusses TVA's work in sustainable buildings and energy efficiency/ sustainable design in lease provisions.

Appendix B:
Climate Change Adaptation Plan 2012

As of December, 2013 available here:
http://www.tva.com/environment/sustainability/index.htm

Appendix C:
TVA Statement on Climate Change Adaptation

As of December, 2013 available here:
http://www.tva.com/environment/sustainability/index.htm

Appendix D:
Integrated Resource Plan

As of December, 2013 available here:
http://www.tva.gov/environment/reports/irp/

Appendix E:
TVA Natural Resource Plan

As of December, 2013 available here:
http://www.tva.gov/environment/reports/nrp/

Appendix F:
TVA Environmental Policy

As of December, 2013 available here:
http://www.tva.com/environment/sustainability/index.htm

Appendix G:
TVA Strategic Plan

As of December, 2013 available here:
http://www.tva.com/environment/sustainability/index.htm

Appendix H:
TVA Procedures for Compliance with the National Environmental Policy Act

As of December, 2013 available here:
http://www.tva.com/environment/reports/pdf/tvanepa_procedures.pdf

Appendix I:
TVA Shoreline Management Initiative
Environmental Impact Statement

As of December, 2013 available here:
http://www.tva.gov/river/landandshore/landuse_shore.htm%23feis

Appendix J:
2012 Strategic Sustainability Performance Plan

As of December, 2013 available here:
http://www.tva.com/environment/sustainability/index.htm

Appendix K:
Office of Management and Budget (OMB) Scorecard 2012

As of December, 2013 available here:
http://www.tva.com/environment/sustainability/index.htm

Appendix L:
TVA Sustainability Plan Summary 2012

As of December, 2013 available here:
http://www.tva.com/environment/sustainability/index.htm

Appendix M:
TVA Clean Air Agreement

As of December, 2013 available here:
http://www.tva.gov/news/keytopics/cleanairagreement.htm

http://www.tva.gov/news/releases/aprjun11/pdf/clean_air_act_agreements_fact_sheet.pdf

Tennessee Valley Authority
Annual Report on Energy Management
FY 2012

(Including Department of Energy
Reporting Guidance and Outline)

1-31-13
Dr. Joseph J. Hoagland, TVA Senior Sustainability Officer (SSO)
John Myers, Director Environmental Policy & Regulatory Affairs (jwmyers@tva.gov)
David R. Zimmerman, Manager, Sustainable Design (drzimmerman@tva.gov)
Including the TVA Internal Energy Management Program (IEMP)

OUTLINE AND INSTRUCTIONS FOR THE ANNUAL REPORT

I. Management and Administration. This section will describe (1) the agency's establishment of an energy management infrastructure and (2) the agency's use of management tools to implement Executive Order 13423:

A. Energy Management Infrastructure

1. **Senior Agency Official**. Identify the agency's Senior Official designated to the E.O. 13423 Steering Committee and describe the official's role and responsibilities, particularly as they pertain to energy and water management:

   Dr. Joseph J. Hoagland is the Senior Sustainability Officer (SSO) and Senior Vice President of Policy & Oversight.

   John Myers, Environmental Policy & Regulatory Affairs under Policy & Oversight servers as TVA's Deputy Senior Sustainability Officer providing support and backup to the SSO.

   David R. Zimmerman is the Chief Energy Manager and Manager of Sustainable Design in TVA's Internal Energy Management Program (IEMP) in the Energy Efficiency and Demand Response organization under Policy & Oversight.

   Carl E. Seigenthaler, Senior Manager of Program Management, is the senior manager over the TVA Internal Energy Management Program (IEMP) in the Energy Efficiency & Demand Response organization.

   The Internal Energy Management Program is part of the Energy Efficiency & Demand Response organization led by Robert M. Balzar, Vice President (who reports to TVA's SSO).

2. **Agency Energy Team**. Identify the members of the team and describe the team's responsibilities and interactions with cross-functional teams designated to expedite the implementation of E.O. 13423:

   The Energy and Environmental Sustainability Committee (EESC) facilitate compliance with applicable federal statutes, Executive Orders, federal regulations, TVA energy and related environmental management objectives, and obligations under the Environmental Protection Agency's (EPA) Green Lights Program (GL), EPA's ENERGY STAR® Buildings Program (ESB) and EPA's ENERGY STAR® Program (ESP). The EESC serves as the agency energy team. This committee is comprised of representatives from each TVA organization responsible for energy management and associated environmental considerations in facility and general operations inside the agency. The EESC provides an avenue for sharing lessons learned and replicating success. EESC Committee members for FY 2012 are listed below:

   Robert M. Balzar, Energy Efficiency/Demand Response
   Annemarie Smith Cooper, Government Relations
   William Cronin, Fossil
   Ella Clark, Procurement
   Rick Eason, Facilities
   Marie Gillman, Nuclear
   David Halicks, Fossil
   Karen Henry, Facilities
   Sandra Koss, Nuclear
   Gregory McDonald, River Operations
   David Zimmerman, Environment & Technology
   Steven Payne, Fossil
   James Linder, Energy Efficiency & Demand Response

Rachael Welch, Information Technology
Sherri Collins, Office of the General Counsel

B. Management Tools

1. **Awards (Employee Incentive Programs).** Describe the agency's use of employee incentive programs to reward exceptional performance in implementing the energy and water requirements in EISA 2007, E.O. 13423 & E.O. 13514:

   TVA utilizes a "Winning Performance" process as a method to reward employees' efforts toward meeting agency performance goals. One of the benefits to TVA's agency goals is savings attributed to the implementation of cost effective energy, sustainable and related environmental projects. TVA also has in place other policies and procedures which provide avenues for employees to be recognized for their outstanding efforts.

2. **Performance Evaluations.** Describe agency efforts to include successful implementation of the energy and water provisions of EISA 2007, E.O. 13423 & E.O. 13514 in the position descriptions and performance evaluations of senior energy officials, members of the agency energy team, heads of field offices, and facility/energy managers:

   To the extent to which employees are responsible for activities that are related to the objectives of E.O. 13423, E.O. 13514, and the Energy Independence and Security Act of 2007, their job descriptions contain reflective line items, and their individual performance is evaluated in terms of the level to which they accomplish such goals.

3. **Training and Education.** Describe activities undertaken to ensure that all appropriate personnel receive training for energy management requirements:

   TVA uses various methods of employee training to accomplish the objectives of the IEMP. The TVA Intranet and employee awareness programs are used as tools to educate employees on how they impact energy efficiency and use, both at work and at home.

   Energy management and associated environmental training is provided to managers and employees as needed. Energy efficiency and information updates on current federal requirements and regulations are tracked by a dedicated staff and are provided to employees, managers, and TVA customers as part of TVA's policy and planning processes. TVA also educates staff on energy and environmental related topics through the TVA Leadership Development and Training Organization. In FY 2012 TVA provided energy-environmental training to 1264 employees at an estimated cost of $75,840.

4. **Use of Energy and Water Efficiency measures in Facilities Covered under EISA Section 432.** Briefly summarize agency efforts under 42 U.S.C 8253(f) in evaluating facilities to identify potential ECMs, implement and follow up on projects, and benchmarked metered buildings. (Detailed data is collected in the EISA 432 Compliance Tracking System, see http://www1.eere.energy.gov/femp/regulations/facility_cts.html:

   TVA continues to evaluate facilities to identify potential ECMs as required by EPAct05 and EISA 2007. During FY 2012, TVA surveyed 22 covered facilities accounting for 3,984,000 square feet. TVA's covered facilities are mostly excluded buildings under EPAct05 and TVA has continued to survey and make energy/water improvements at goal subject buildings.

   In FY 2012, TVA implemented $8.9M dollars worth of improvements resulting in $890,900 dollars in annual savings, 10,480 MWh in energy consumption savings and 16,300,000 gallons in water consumption savings at both covered and non-covered facilities.

TVA successfully benchmarked its metered buildings where possible. TVA's covered facility list includes 53 buildings, of which 14 of the buildings are metered. Of the 14 buildings only 8 buildings were benchmarked due to 2 buildings having incomplete smart meter data and 4 buildings not having correct space types available to properly benchmark the buildings. The remaining 39 buildings that are not metered are located at plant sites where it is not possible to separate the energy used to generate, transmit and control electricity from the building energy usage.

5. **Showcase Facilities.** Highlight exemplary new or existing facilities that the agency has designated Showcase Facilities:

TVA's Chattanooga Office Complex (COC), a 1.2-million-square-foot office facility completed in 1986, integrates the use of passive energy strategies, energy management practices, environmental programs and activities, and aggressive energy reduction operation and maintenance efforts resulting in the complex remaining a model facility in TVA. It makes up approximately 13 percent of the total standard building square feet for TVA and was recognized in FY 2010 for its energy and related environmental performance by receiving an ENERGY STAR® Building Label from the EPA.

6. **Other Energy and Related Environmental Initiatives:** Highlight new or existing energy and related environmental initiatives that the agency has accomplished in FY 2012. Provide a brief description of these initiatives:

SUSTAINABLE ACQUISITIONS

TVA reduces environmental impacts at the COC and other facilities through sustainable acquisition (affirmative procurement) of materials with recycled content. TVA's sustainable acquisition program (Affirmative Procurement Plan) has been enhanced or advanced to include an updated Green Procurement Plan, an integrated strategy for greening the supply chain, training, communications, improved business processes, cross-functional sustainable acquisition team, supplier engagement, and collaborations with federal agency workgroups, utility industry peers, and key stakeholders. In FY 2012, TVA spent approximately $20.9 million on materials and services that were coded green, including commercial sanitary tissue products, non-paper office products, construction products (concrete), landscaping products, park and recreation products, transportation products (traffic barricades), vehicular products (re-refined oil) and miscellaneous products (signage). According to supplier partners' FY12 reports, TVA invested approximately $6.4 million on recycled materials meeting the guidelines established under the Resource Conservation and Recovery Act (RCRA). TVA is committed to advancing sustainability of the entire supply chain through its membership, collaborations, and partnerships with the Green Supplier Network (GSN), Electric Utility Industry Sustainability Supply Chain Alliance, and federal agency working groups.

TVA recognizes Supply Chain sustainability as a key opportunity to leverage TVA's purchasing power in support of TVA's mission and corporate responsibility and align with TVA's renewed vision. This integrated approach has resulted in the following key accomplishments:

- **During FY12, TVA reported an average quarterly sustainable acquisitions (SA) rating of 96%, against OMB's required 95% target.**
- **As a Green Suppliers Network (GSN) Corporate Champion, TVA completed its first GSN-sponsored Lean and Clean Technical Review resulting in labor and fuels savings for TVA's waste management supplier.**
- **Approximately 60% of TVA's Tier 1 Strategic Suppliers participated in the 2012 Center for Advance Procurement and Supply (CAPS) Research and Electric Utility Industry Sustainability Supply Chain Alliance (EUISSCA) annual survey to measure suppliers' commitment to environmental sustainability.**
- **As a corporate member, TVA increased involvement, participation and support of EUISSCA's survey initiative and meetings.**

- **Leveraged relationship with TVA's office supply vendor to default all standard paper orders to a 30% recycled content which improved TVA's recycled paper purchase from 38% in FY11 to 89% in FY12.**
- **Implemented actions to achieve new biobased purchasing compliance requirements by targeting relevant bio-based acquisitions in TVA's electronic product catalog during FY 13.**
- **Established reduction in fleet petroleum baseline/goals**
- **Benchmarked utility industry, federal agencies and leading companies to advance supply chain sustainability.**

WASTE MINIMIZATION AND RECYCLING PROGRAMS

TVA is a Federal Charter Partner in the EPA "WasteWise Program." Through this program, TVA has made a commitment to achieve results in three areas:

1) **Waste prevention**
2) **Collection of recyclables**
3) **Use of recycled materials**

This aligns with TVA's mission of stimulating economic growth by protecting the Tennessee Valley's natural resources and building partnerships for the public good. TVA has established the Solid Waste Leverage Team and a Solid & Hazardous Waste Regulatory Policy Team to support the "WasteWise Program."

During FY 2012, TVA generated 22,520 tons of municipal solid waste in facilities including the COC. TVA sent 1,152 tons of office type recyclables, includes mixed paper, plastics, aluminum, cardboard and glass, to recyclers for a recycle total of 5.12%. TVA partners with a nonprofit organization which trains and develops work skills in mentally and physically challenged clients. These clients, in conjunction with their respective organizations, collect, sort and market the recycled material from the COC. In addition to the typical office waste recycling, TVA continues its efforts in recycling fluorescent light tubes, oil, scrap metals, building materials, wood waste, and ballasts. TVA also utilizes a redeployment program which collects and redeploys used equipment and materials.

Sustainable carpet is used throughout the COC and other TVA locations. This carpet uses high performance backing made from one hundred percent recycled content. The carpet is installed as tiles facilitating removal and replacement of worn or damaged sections of carpet in the COC or as identified for new areas throughout the TVA region. TVA has an agreement with the carpet manufacturer to recycle carpet removed from TVA properties (owned or leased), keeping used TVA facility carpet out of landfills in addition to saving an equivalent amount in raw materials.

In FY 2012, out of the funds spent on general office supplies and toner, 17% of those purchases were spent on recycled products. During FY 2012 TVA continued its aggressive pursuit of green purchases and reporting. TVA has asked its product providers to add any recycled content, environmentally preferred, low standby power, bio-based, and Energy Star products to their report data for TVA.

ENERGY EFFICIENCY AND DEMAND RESPONSE (EEDR) PROGRAM

Reducing Tennessee Valley consumers' energy consumption and TVA's peak loads through the Energy Efficiency and Demand Response (EEDR) program is a fundamental element of how TVA will continue to serve the Valley in the 21st century. TVA's EEDR program is beneficial towards delivering low rates, high reliability and cleaner air. TVA also contributes to local economies through its EEDR programs by creating jobs and working with local suppliers.

TVA is currently participating in more than 30 EEDR programs, which are delivered in partnership with Local Power Companies and include TVA's Energy Right Solutions, Smart Grid Pilot and Energy Management programs. In 2012, these programs reduced electric power consumption by 560 gigawatt hours. EEDR is the lowest cost resource available to TVA and is

part of TVA's commitment to a sustainable future by helping consumers in the Valley to make informed decisions about when and how to use electricity in a way that keeps their power bills affordable.

COMMERCIAL AND INDUSTRIAL (C&I) INITIATIVES

TVA, in cooperation with the Local Power Companies of the Tennessee Valley, continues to provide solutions to commercial and industrial customers for their energy-related problems, to encourage energy efficient operations, and slow power demand growth in the Valley. Presently, TVA offers programs that target industrial and large commercial customers: the Tailored Solutions for Industry, Custom Commercial and Industrial, Commercial and Industrial Standard Rebate, and Small Business Direct Install.

Tailored Solutions for Industry is a holistic approach that identifies plant energy efficiency opportunities for industrial customers, both Local Power Company and direct served by TVA, who has a contract demand greater than 5 MW. This program leverages Department of Energy (DOE) funded Save Energy Now (SEN) assessments, which are offered at no cost to large manufacturers who meet DOE program qualifications and is supplemented as needed with onsite assessments performed by independent private sector professional engineers funded by TVA. In addition to advice, this program provides monetary incentives for customers who implement assessment recommendations. Tailored Solutions for Industry is available Valley-wide to qualifying industrial customers and achieved 9.7 MW demand and 80 GWh reductions during FY 2012.

Energy Right Solutions for Business and Energy Right Solutions for Industry programs were available to all commercial customers and industrial customers with a contract demand of 5 MW or less. These two programs were offered to all 155 TVA Local Power Companies; and in FY 2012, 155 Local Power Companies have contracted with TVA to participate. Both programs offer three levels of advice: the Initial Energy Assessment, the Onsite Energy Review, and the Detailed Energy Study. In addition, monetary incentives were offered to those customers that implement energy saving lighting, HVAC, and any other measures that reduced electric energy consumption. The incentives were offered either through a Prescriptive or a Custom incentive approach. The program also provided pre and post installation validation of school energy efficiency projects to support the State of Tennessee Energy Efficient Schools Initiative. The energy right solutions for Business and energy right solutions for Industry Programs, plus related special projects, achieved 1.99 MW through Custom and 29.72 MW Prescriptive and 13.07 GWh through Custom and 185.81 GWh through Prescriptive, resulting in a total of 31.71 MW of demand reduction and 198.88 GWh of energy savings during FY 2012.

RESIDENTIAL INITIATIVES

New Homes Plan is a turnkey option offered to residential new home builders in the Tennessee Valley that promotes energy-efficient construction by offering incentives to exceed minimum construction standards. The incentives reduce the risk of incorporating new technologies in their product line. The 2 tiers available for this program; a certified home level (ENERGY STAR and/or RESNET Certification) and a prescriptive standard level provide flexibility to builders and allow them to create product differentiation in the marketplace. Additionally, incentives are paid for advanced water heaters installed in new homes with savings of 10.68 GWh and 2.51 MW. (FY 2012 total installations: 3,092; energy right – 769 units; EnergyRight® Platinum Certified – 2,323 units)

Self-Audit is an online and paper-based Home e-Valuation that offers a do-it-yourself tool allowing residential customers to play an active role in saving energy in the comfort of their home. The personalized report provided after the audit details the home's annual and monthly energy usage by appliance. Customers are given a number of energy recommendations to help them save money while becoming more energy efficient.

**Customers can start saving money immediately by installing the various items included in an energy- savings kit sent to them as a thank you for completing the audit.
Savings of 9.29 GWh and 2.55 MW. (FY 2012 audits – 12,842)**

Volume Heat Pump Program for Manufactured Homes promotes the installation of high efficiency 13 SEER heat pumps in manufactured homes built within the last 10 years and sited in TVA's service area. TVA is also conducting an ENERGY STAR® Pilot Program for Manufactured Homes with Systems Building Research Alliance (SBRA) to promote ENERGY STAR® homes in the Valley with savings of 14.5 GWh and 0.25 MW. (FY 2012 installations – 1,140 units, plus 481 ENERGY STAR® units)

Heat Pump Plan promotes the installation of high-efficiency heat pumps in homes and small businesses by offering Market Value Payments (MVPs) to power companies for installations meeting the EnergyRight® standards. Installation, performance, and weatherization standards have been established to ensure the comfort of the customer, the appropriate sizing of equipment, and the proper operation of the system. TVA fosters a Quality Contractor Network (QCN) to maintain high installation standards. Through a third-party lender, TVA provides financing for residential heat pumps with repayment term of up to 10 years. Savings of 20.6 GWh and 9.4 MW (FY 2012 installations – 11,457)

In-Home Energy Evaluation is a basic walk through energy audit (or evaluation) for residential customers. After the evaluation, the customer receives a detailed report including energy efficiency recommendations based on cost and payback. There may be an initial fee for the evaluation; however, that amount is refunded if the customer spends at least $150 on recommended reimbursable improvements. A turnkey financing option was developed and is now available to interested Local Power Companies. The pilot's success is attributed to the increase in the number of participants, awareness of the program, advertising, publicity, and Quality Contractor Network referrals. A direct install promotion was incorporated into the In-Home Energy Evaluation Pilot Program for turnkey program participants. For added customer value, compact fluorescent bulbs (CFLs), low flow showerheads and faucet aerators are installed in each participant's home during the initial evaluation. Savings of 25.68 GWh and 7.32 MW (FY 2012 evaluations – 17,861)

Tennessee Weatherization Assistance Program (WAP) is a partnership with TVA and the State of Tennessee to share data collected during low-income audits under the DOE's Weatherization Assistance Program. This program enables low income families to permanently reduce their energy bills by making their homes more energy efficient. Funds are provided by DOE to make home improvements using the industry standard protocols for the measurement of energy use and the installation of energy improvements. The energy conservation resulting from these efforts helps our country reduce its dependence on foreign oil and decrease the cost of energy for families in need while improving the health and safety of their homes. Savings of 41.88 GWh and 4.07 MW (FY 2012 audits – 13,837)

Retail Lighting is an effort to increase the usage of compact fluorescent lamps (CFLs) in the Tennessee Valley marketplace by offering 4-pack of CFLs to customers at local home improvement stores. In FY 2012, TVA performed market testing of Retail Lighting promotions in an effort to collect data and information to help shape future lighting programs. Savings of 6.33 GWh and 0.21 MW (FY 2012 CFLs 4-packs disbursed through this program – 66,631)

DEMAND RESPONSE

Commercial & Industrial Direct Load Control is a demand response program implemented through a third party vendor. The program had a nomination of 253 MW at the end of FY12 derived from 108 participating Local Power Companies and 1,019 end-use commercial and industrial customers. This program is one of the valued resources within the Virtual Power Plant of the Power Supply Plan that can be called up to 40 hours per calendar year.

Dispatchable Voltage Regulation (DVR) utilized voltage regulation to the end-of-line on

primarily commercial and industrial-loaded feeders. Day-ahead notification is provided to Local Power Companies to reduce load via voltage reduction. Five DVR participants became active in FY12: Chattanooga EPB (30.6 MW), Fort Loudon EC (6.0 MW), Morristown US (6.005 MW), Nashville ES (40.0 MW), and North East Mississippi EPA (1.3 MW) providing an additional 83.905 MW to the demand response portfolio. The remaining seven pilot participants will be qualified by the end of FY13. This product is the principal component of a Smart Grid pilot with 16 participating Local Power Companies nominating some 168 MW.

Residential & Small Commercial Direct Load Control is a Smart Grid Pilot program with 12 Local Power Companies controlling air conditioning and water heating load. Currently, Pennyrile RECC is the sole qualified participant providing 1.88 MW of curtailable load. When fully subscribed, the Smart Grid Direct Load Control program will provide 53.3 MW of electric load.

GREEN POWER SWITCH® (GPS)

See II. (Energy Efficiency Performance), section B. (Renewable Energy).

GENERATION PARTNERS

In 2003, TVA launched the Generation Partners (GP) pilot program that supports homeowners and businesses that want to install small-scale renewable generating systems up to 50 kilowatts in size. The program also supplies TVA's Green Power Switch® program with renewable power, making more green power available to consumers and creating a market for green power generation.

In November 2011, the TVA Board approved the transition of the GP pilot program to a long-term sustainable program called Green Power Providers. The program design details were the result of collaboration between TVA, the Tennessee Valley Public Power Association's Energy Services Committee and various power distributors. Other external stakeholders also provided input towards the development process. The Green Power Providers program replaced the Generation Partners pilot program on October 1, 2012. Green Power Providers, implements industry best practices to continue helping add sustainable solar, wind, biomass and micro-hydro energy in the Tennessee Valley.

Over the last several years, Generation Partners experienced tremendous growth. At its expiration on September 30, 2012, GP had 1186 partner installations totaling over 67 MW of renewable generation. To put this fact into perspective, in 2009, GP had 77 installations with an operating capacity of 454 kW largely made up of solar and a small amount of wind.

TECHNOLOGY INNOVATIONS (TI)

TVA TI provides scientific and technological solutions to problems in the areas of generation, transmission and energy utilization, and evaluates emerging technologies that could benefit TVA and its customers in the future. Signature technologies for TI include Small Modular Reactors, Smart Grid, and Electric Transportation. TVA also works with partners in industry and academia as well as with the Electric Power Research Institute (EPRI) and the Oak Ridge National Lab (ORNL) to help bring technologies to the marketplace for the benefit of TVA's operations and its customers. Efforts in these areas are included in this report.

TVA TI promotes sustainability by partnering with TVA Facilities Management to test and showcase sustainable technologies.

TVA TI fulfills its commitment to provide competitively-priced and reliable power, while promoting environmental stewardship and economic development. TVA TI works to help develop, demonstrate, and deploy new energy-related technologies for a better tomorrow.

TI RECENT HIGHLIGHTS AND ACCOMPLISHMENTS

- **Evaluating and demonstrating Energy Efficiency and Demand Response technologies to prepare for future changes in the energy market place. Demonstrations underway include:**

    - **Near Zero Energy House research - TVA is continuing to work with ORNL and EPRI in testing three lab houses representing a standard base case Builder house Home Energy Rating Score (HERS) Index 101); a high-efficiency Retrofit House (HERS Index 68); and a near-Zero Energy House (nZEH) (HERS Index 34). The three houses are being operated with simulated occupancy which includes controlling lighting, clothes washer, dryer, dish washer, refrigerator and freezer doors, plug loads, etc. The houses have approximately 100 sensors each which monitor temperatures, humidity, and branch circuit loads to evaluate the different envelope and equipment performance. The houses were completed to TVA/ORNL specifications in early 2009, and simulated occupancy started in June 1, 2009. The net energy usage for the three houses from October 2011 through September 2012 was 19,883 kWh for the Builder house, 11,987 kWh for the Retrofit house, and 6,772 kWh for the nZEH. This represents an energy savings of 40% for the Retrofit house and 66% for the nZEH over the Builder house. Modifications for the third year testing included updating the HVAC system on the Retrofit house to a variable capacity air-source heat pump, and changing the conventional heat pump water heater to one that uses CO2 as a refrigerant.**
    - **Four other lab houses are being evaluated by the Zero Energy Building Research Alliance (ZEBRAlliance) with ORNL in Oak Ridge, Tennessee. TVA TI is one of the partners funding this effort that will measure the performance of four different envelope designs. The envelope designs are structurally insulated panels (SIPS), advanced framing using 2x6 on 24 inch centers, double wall with phase change material mixed onto the insulation of one of the walls; and conventional framing with exterior insulation and finish system (EIFS). Two of the four houses are testing geothermal ground heat exchangers that utilize the foundation excavations and rainwater gardens. The third house uses a conventional vertical geothermal ground-heat exchanger and the last house uses a high-efficiency air-source heat pump. Simulated occupancy testing started on the four homes in fall 2010 and will conclude in early 2013.**

    - **TVA-GENERAL ELECTRIC-GLASGOW SMART APPLIANCE DEMONSTRATION PROJECT**
      TVA, General Electric, and the Glasgow Electric Plant Board (Glasgow EPB) worked together to provide 20 Glasgow EPB customers with a suite of Energy Star grid enabled appliances, home energy management (HEM) systems, and other smart devices as part of a pilot study to understand the effectiveness of smart appliances and (HEM) systems at reducing energy use and electricity peak load consumption.

      The pilot will help assess how effective HEM technologies, robust broadband networks, and various price incentives are in helping customers shift energy usage patterns. As utilities look to manage "peak demand" – periods of high energy use that often occur only a few hours per day – many are considering pricing structures and new technologies that incent and reward customers for using electricity during "off-peak" hours. The pilot will be testing new products and various pricing structures to encourage energy efficiency and "off-peak" energy usage. Specifically, the 24-month pilot will assess and measure:

        - **Energy savings associated with new Energy Star vs. old existing appliances.**
        - **Customer response to financial incentives that encourage off-peak energy use.**

- **Changes in residential load profiles feasible with HEM systems and customer interaction.**

- **LONG TERM PERFORMANCE OF GEOTHERMAL HEAT PUMPS STUDY TVA and Southern Company collaborated through EPRI to do a study of the long term performance of commercial geothermal heat pump systems that have been operating for at least ten years. The results are being disseminated through a series of articles in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Journal to help engineers design more efficient geothermal heat pump systems.**

- **EPRI National Energy Efficiency Demo – TVA and EPRI are partnering in the National Energy Efficiency Demonstration, a field demonstration of six categories of "hyper-efficient" technologies to fundamentally change energy usage in U.S. buildings and homes. The six categories include: Variable Refrigerant Flow Air Conditioning, Efficient Data Centers, LED Street and Area Lighting, Heat Pump Water Heaters, Ductless Residential Heat Pumps and Air Conditioners, and Hyper-Efficient Residential Appliances. The technologies are being demonstrated with several utilities in different climate regions to assess their performance when deployed in diverse environments.**

  EPRI concluded the formal demonstration in March 2012 and is making an executive summary public. TI will continue the demonstration through December 2012 to evaluate the energy savings potential and collect data for planning TVA energy efficiency initiatives. TVA has demonstration sites located in Chattanooga, Knoxville, Cookeville, Camden, Centerville, and Bristol, TN as well as Glasgow, KY.

- **Electric Transportation Activities Include:**

  - **The TVA SMART Station Design and Deployment - The Smart Modular Area Recharge Terminal or TVA SMART Station is a novel Electric Vehicle charging system that integrates solar generation, stationary battery storage, electric vehicle supply equipment (EVSE) and smart controls to effectively link plug-in electric vehicle and the power grid. Onsite solar generation helps offsets electrical energy consumption from charging EVs while the stationary storage system and smart controls can eliminate local peak demands from charging multiple vehicles simultaneously. TVA in collaboration with Local Power Companies, EPRI, ORNL, and Nissan North America has used the TVA SMART station design to deploy 125 charging spaces across Tennessee. The engineering design of the system is free to the public in hopes that the best practices and lessons learned from TVA's deployment will spur others to support electric transportation with similar systems around the country.**

- **Smart Grid Activities include:**

  - **Substation Energy Efficiency Pilot- Working with EPRI, four TVA Substations were identified to support an energy efficiency evaluation and demonstration pilot project. The selection of the four substations focused on Substation ages, locations, and voltage classes. The substations are audited, and then implemented with mitigation technologies and methodologies to support in the reduction of energy usage within the substation. These mitigation technologies and methodologies will be further audited. The resulting findings will be evaluated and compared to the initial audit results to determine the effectiveness of the mitigation technologies.**

- **Small Modular Reactors (SMRs) activity summary:**

    - **The mPower/TVA team was selected for the Financial Opportunity Announcement from DOE for a 50-50 cost sharing for design and licensing of a SMR at the Clinch River site. SMRs could provide an important option for clean, base load electricity generation capacity for TVA and the USA. Relative to large reactors, SMRs offer potential improvements in safety and security, reduced construction times, and more affordable increments of generation capacity which could significantly improve financing costs. Currently, TVA is preparing a license application to the Nuclear Regulatory Commission to license up to four B&W mPower SMRs at its Clinch River Site in Oak Ridge, Tennessee.**

COMPUTER UPGRADES AND EFFICIENCY

TVA replaces older personal computers with the most energy efficient models available. TVA invests in PCs that are based on the newest Third Generation Intel Core i5/i7 processors. These systems exceed Energy Star and EPEAT standards by using less energy while in fully active modes. TVA is implementing advanced power management technology to significantly reduce total PC power consumption. TVA implements server technology that reduces the quantity of servers required, and the energy needs for the servers that are required.

- **PC Advanced Power Management - Advanced Power Management is scheduled to be completed May 31, 2013. An expanded complement of 35 new shared TVA-IT servers are now in service at key sites. When fully implemented during the first half of CY 2013, the enterprise-wide project will ensure that TVA PCs are automatically turned off when not in use. IT deployed 2,675 PC's in FY2012 that were Energy Star and EPEAT compliant.**

- **Server Virtualization - TVA uses server virtualization to operate 1204 virtual servers on 176 physical hosts, a net reduction/avoidance of 1028 servers. In virtualization, a single physical server is partitioned into multiple logical constructs that operate as independent servers while sharing the resources of the partitioned server.**

- **Blade Server Technology Standard – When a physical server is required, the TVA standard server is based on a blade server architecture where blade enclosure and rack space is available (otherwise low/power DL360s are used). This blade server architecture requires less power and generates less heat than traditional server architectures. Blades are standard for Windows and Linux servers. New physical arrangements of the blades in the data center have resulted in a total load reduction of more than 333kW in the Chattanooga Data Center.**

- **Monitor Efficiency - TVA maintains standardized monitor management processes that automatically suspend inactive displays. All standard monitor purchases are Energy Star and EPEAT compliant LCD displays.**

II. Energy Efficiency Performance. This section will highlight progress toward the performance metrics compiled and calculated in the Annual Energy Management Data Report.

A. Energy Intensity Reduction Performance

TVA's facility inventory and the type of activities for which these facilities are used continue to evolve as the agency faces new challenges. Facility information is updated through the EESC. The EESC remains the focal point for disseminating energy and related environmental information to TVA organizations and employees. To benchmark success, the EESC utilizes tools such as an internal database, the OMB Scorecards and the agency Strategic Sustainability Performance Plan. The EESC allows representatives to voice problems in meeting regulations and goals and share success stories which can then be applied throughout TVA. To benchmark success, the EESC uses many tools including databases and portfolio management software.

TVA NEW BUILDING DESIGN

TVA incorporates sustainable practices and energy efficiency standards into new building designs. These designs made use of technologies such as day lighting, energy efficient lighting/HVAC, efficient lighting/HVAC controls, passive solar heating, premium efficiency motors, demand reduction, and non-toxic, recycle-content building materials along with reusable/recyclable building materials.

TVA FACILITY IMPROVEMENTS

TVA implements various energy efficiency and water reduction improvements in its facilities. Some typical improvements are as follows:

Lighting and Energy Efficiency:

- **New lighting systems using T-8 lamps, electronic ballasts, and motion sensors have been installed in many existing buildings.**
- **New lighting systems using T-5 lamps, electronic ballasts, and various types of control systems have been installed in existing buildings.**
- **New dimming systems to take advantage of areas that can benefit from daylighting.**
- **Incandescent lights have been replaced with compact fluorescents in many facilities.**
- **Occupancy sensors are being installed to control lighting and equipment in individual spaces, open offices, and personal work stations.**
- **Old mercury vapor lighting and incandescent lighting was upgraded to metal halide and high pressure sodium lighting at various fossil sites and switch yards.**

HVAC Improvements:

- **Energy Management Control Systems have been added and/or upgraded to control heating and cooling systems, lighting systems, motors, exhaust fans, pumps, and other energy using equipment at TVA facilities.**
- **Variable Frequency Drives have been added to building heating, ventilating, and air-conditioning units.**
- **New high-efficiency heat pump systems have been installed to replace old window units and out of date package units at hydro, nuclear and fossil plants.**
- **Existing air handlers have been rebuilt to improve efficiency.**
- **Existing chillers have been replaced and/or rebuilt to improve efficiency.**
- **Installation of energy efficient elevator equipment including more operational optimization.**
- **Installation of hot isle/cold isle data center HVAC configurations to reduce energy**
- **Installation of data center HVAC units and controls to optimize cooling to the servers/racks.**
- **Upgrade laboratory ventilation system to energy efficient and provide a safer working environment.**
- **Installed smaller boilers in buildings to eliminate use of an older centralize inefficient boiler and distribution system.**

Data Center Improvements:

- **Chattanooga Data Center and Knoxville Data Center – TVA has implemented improvements in cooling for both the Chattanooga Data Center (CDC) and Knoxville Data Center (KDC).**
- **An HVAC operation communication system allows air units inside the Data Center to work as one system vs. working independently.**
- **Sensors located inside cabinets allow systems to cool as needed.**
- **VFD drives in certain air units save energy by letting air unit drives spin as needed vs. always operating at 100%. TVA is seeing a 40% fan savings with VFD drives.**
- **Utilization of an upgraded direct air floor grate system.**
- **New floor tiles are designed to push cold air into Data Center racks, providing a 93% better air flow hitting the face of the equipment.**
- **These tiles also have dampers so we can adjust cooling needed rack by rack inside Data Centers.**
- **Elimination of bypass air saves operating expenses and increase air units efficiencies.**
- **Open area can deliver up to 2,600 CFM.**

Water Reduction:

- **Replaced COC restroom fixtures with low flow fixtures and lower volume flush valves**
- **Changed out the toilets in the KOC and replaced faucet aerators for water savings.**
- **Implemented water saving devices at various locations.**

OPERATION AND MAINTENANCE ACTIVITIES FOR BUILDINGS

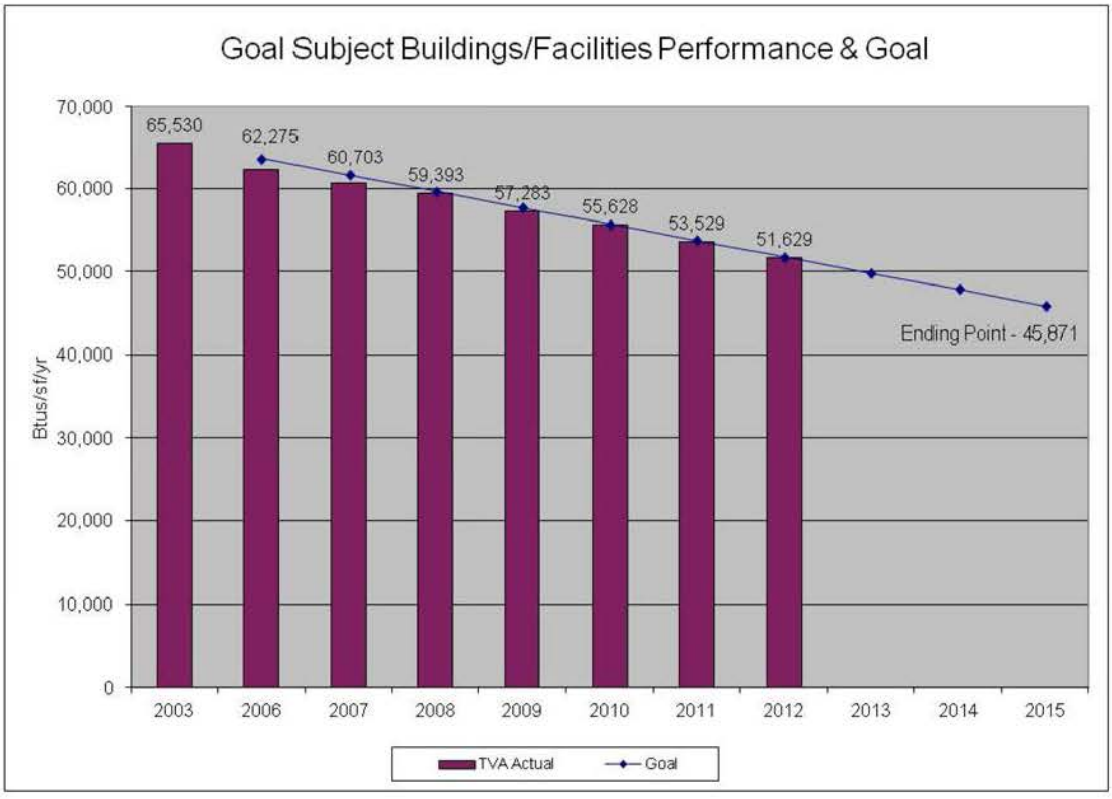
TVA continues to improve its energy efficiency and environmental stewardship through operation and maintenance activities. The following is a list of operation and maintenance practices and activities for FY 2012:

- **Recycle scrap metals, used oil, substation and communication station service batteries, and storm damaged or deteriorating steel structures**
- **Recycle expired fluorescent lamps**
- **Recycle or reuse waste material when feasible**
- **Educate employees on energy efficiency**
- **Encourage employees to implement energy-efficient ideas and practices**
- **Turn off equipment when not needed**
- **Have custodians turn off building equipment after cleaning**
- **Clean lamps, fixtures, and diffusers**
- **Use the most efficient lamps available (i.e., screw-in fluorescent, screw-in halogen, screw-in high pressure sodium, energy efficient fluorescent lamps, etc.)**
- **Reduce lighting levels where light output exceeds requirements for the space**
- **Install motion sensors to control lighting in rooms where economical (offices, restrooms, conference rooms, etc.)**
- **Install light switches or motion sensors in areas not currently controlled**
- **Disconnect unnecessary lamps and ballasts**
- **Disconnect unnecessary transformers**
- **Install energy-efficient electronic ballasts**
- **Perform group re-lamping**
- **Install photocell control on outdoor lighting**
- **Rewire lamps to permit shutoff of unneeded lights**
- **Minimize the number of ballasts installed (use a four-lamp ballast for two adjacent two-lamp fixtures)**
- **Revise building operating procedures for efficiency and cost**
- **Install programmable thermostats and use the night and weekend setback features to reduce energy use during unoccupied periods**
- **Set thermostats in mechanical rooms and unoccupied areas so the least amount of energy will be used without causing the equipment to deteriorate**
- **Verify and calibrate all controls periodically, including time clocks**
- **Keep all outside doors and windows closed when heating or cooling, using vestibules properly**
- **Keep garage and warehouse doors closed as much as possible while heating or cooling**
- **Replace broken windows**
- **Replace missing insulation**
- **Add caulking where necessary**
- **Replace worn weather-stripping on windows and doors**
- **Reduce the amount of infiltration air where possible but meet fresh air requirements**
- **Eliminate ventilation during unoccupied hours**
- **Operate exhaust fans only when required**
- **Verify that all outside air dampers are operating properly**
- **Operate HVAC in economizer mode when conditions are favorable**
- **Eliminate ductwork leaks**
- **Reduce ductwork and piping resistance where possible**
- **Avoid heating and cooling at the same time**
- **Change filters as recommended**
- **Clean HVAC coils**
- **Test and balance HVAC systems (re-commissioning)**

- **Optimize chiller operation**
- **Recycle waste heat when feasible**
- **Lower domestic hot water temperature**
- **Repair hot, chilled, or domestic water leaks**
- **Cut off nonessential gas to buildings during the summer**
- **Replace motors, use properly sized energy efficient motors**
- **Balance three-phase loads**
- **Use cog-type belts for higher efficiency**
- **Eliminate steam trap leaks**
- **Repair water leaks**
- **Install low-flow faucets and shower heads**
- **Install automatic flush valves**
- **Properly insulate hot water and steam lines to reduce energy loss**

1. **Goal Subject Buildings.** Discuss any extenuating factors that may be skewing the agency performance toward the energy intensity reductions reported in FY2012. (Note: The energy intensity reductions will be calculated and reported in the performance summary spreadsheet located in the GHG and Sustainability Data Report): Report energy use for buildings in units of Btu-per-gross-square-foot (Btu/GSF) for FY 2012:

   TVA continues to reduce energy use in its facilities through the coordination of energy management efforts and implementation of energy efficiency improvements. TVA ended FY 2012 with a Btu/GSF/Yr of 51,629 (including the use of renewable energy generated and used on site); this is a 21.2 percent reduction from the FY 2003 base.



2. **Excluded Facilities.** Refer to Section IV (B) of this guidance—a list of excluded facilities and an explanation of why they were excluded:

   TVA has a long history of demonstrating stewardship toward energy reduction and will continue to work toward reducing energy use in its generation, transmission and related energy-intensive

buildings. Energy reduction in these buildings has become increasingly more difficult given the majority of the energy consumption in these buildings is largely attributed to process energy (generation and transmission of electricity). In recognition of the above and the fact that only so much can be done to make these buildings to make them more efficient in a cost effective manner, TVA, in discussion with DOE, has decided to exclude these buildings. Attachment 2 contains a list of TVA's excluded facilities for FY 2012. The TVA Internal Energy Management Program is surveying many of these facilities to identify energy reduction opportunities and meet the covered facilities survey requirements under EISA 2007. In FY 2012, 3,984,000 sq. ft. of excluded facilities was surveyed meeting the 100 percent goal. Energy Conservation Measures (ECM's) meeting the Life Cycle and Simple Payback (SPB) criteria were identified. These ECMs included lighting improvements, controls, water improvements, insulation and window replacement. The following is a list of projects developed in FY 2012 that meet the payback criteria related to energy/water efficiency and sustainability:

Agency Facility Number	Facility Name	Gross Square Footage	Estimated Implementation Cost of Measure(s) *$*	Annual Data				
				Estimated *Annual* Energy Savings For this Reporting Year Only ***Million BTU***	Est. Annual Energy Cost Savings *$*	Est. *Annual* Water Savings ***Thousand Gallons***	Est. Annual Water Cost Savings *$*	Est. Other Annual Ancillary Cost Savings *$*
1042	BFN TURBINE BUILDING	468,000	$ 44,991	292.4	$ 4,285	0	$ -	$ 847
641	ALF POWERHOUSE	429,000	$ 1,287,789	10,912.5	$ 159,963	856	$ 1,138	$ 11,190
1041	BFN REACTOR BUILDING	362,000	$ 1,705,776	6,095.1	$ 89,315	0	$ -	$ -
1056	SQN TURBINE BLDG.	326,000	$ 329,316	4,047.1	$ 59,303	0	$ -	$ 10,346
3067	RAC RPS POWERPLANT CHAMBER AND TUNNELS	244,000	$ 346,064	2,993.7	$ 43,481	133	$ 532	$ 5,157
1049	SQN AUX BLDG	218,000	$ 1,475,080	9,708.8	$ 153,123	0	$ -	$ 24,227
2999	WBN AUXILLARY BUILDING AUX	218,000	$ 284,533	3,449.6	$ 50,548	0	$ -	$ 6,078
810	MSL PSS PSC 127 SHOP 1 MATERIAL DISTRIBUTION	209,000	$ 630,644	0.0	$ 103,656	0	$ -	$ 3,200
314	MSL NATL FERTILIZER AND ENV. RESEARCH CENTER	186,000	$ 253,529	3,323.2	$ 81,749	125	$ 213	$ 18,240
1109	SQN OFFICE	125,000	$ 879,176	6,422.3	$ 94,110	149	$ 172	$ 17,503
758	SHF AFBC BOILER BLDG	120,000	$ 254,171	3,002.8	$ 44,002	0	$ -	$ -
1116	SQN TRAINING CENTER	119,000	$ 454,806	1,209.7	$ 17,727	157	$ 182	$ 11,721
677	FNH POWERHOUSE/DAM	118,000	$ 205,370	1,721.1	$ 27,743	103	$ 1,107	$ 1,201
3001	WBN TURBINE BUILDING TB	113,000	$ 1,573,507	9,448.7	$ 138,458	203	$ 1,501	$ 6,261
3088	CUF ABSORBER BUILDING	108,000	$ 797,777	5,165.9	$ 75,697	53	$ 584	$ 14,719
754	CHH POWERHOUSE/DAM	102,000	$ 223,058	1,541.1	$ 22,584	135	$ 196	$ 3,766
1078	BFN TRAINING	101,000	$ 87,941	365.1	$ 5,351	202	$ 577	$ -
1067	BFN MATERIALS	98,000	$ 242,555	2,494.3	$ 36,545	304	$ 871	$ 549
811	MSL PSS PSC 127 SHOP 2	94,000	$ 117,748	890.3	$ 22,529	48	$ 82	$ 506
2995	WBN TRAINING CENTER	94,000	$ 213,397	2,161.4	$ 31,527	322	$ 2,381	$ 3,034
276	MSL CHEMICAL ENGINEERING BUILDING	48,000	$ 18,685	834.4	$ 14,499	0	$ -	$ -
7329	BFN NEW ADMIN BUILDING	84,000	$ 31,355	684.2	$ 10,026	517	$ 1,478	$ -
TOTALS		3,984,000	$ 11,457,268	76,763.7	$1,286,221	3305	$ 11,014	$ 138,545

POWER SYSTEM OPERATION EFFICIENCY

TVA's staff considers energy efficiency and environmental impacts for each project and activity. The following are examples of these activities.

Customer Commitment Activities:
TVA responds to the needs of its distributors and direct-served customers through many activities including the placement of new customer delivery points in-service.

Economic Development Activities:
TVA continued to support economic development efforts in FY 2012 as the TVA service area continues to attract new industry. Some of the economic development activities included delivery point expansions, construction of transmission lines, construction of switching stations, and construction of substations.

Infrastructure Development Activities:
Many infrastructure projects have been completed which include additional transformer banks, miles of transmission line extensions, the addition of substations, replacement of overstressed circuit

breakers with newer more efficient ones, replacement of problematic telecommunications equipment essential to controlling TVA's transmission system, replacement of problematic relays and switches at numerous locations and future projects including the addition of a second 500-161-kV transformer at the Union, Mississippi substation.

Support of Generation Activities:
TVA is in the process of constructing new generation so that our system has the capacity required to reliably meet the demand. Energy Delivery (ED) supports these projects which include Watts Bar Unit 2 and others. ED activities which support the generation projects include switchyard and transmission line modifications necessary to support the new generation.

Response to Emergent Issues:
In order to maintain system integrity and reliability for TVA customers, ED responded to several storm, flood, fire and other events that occurred throughout FY 2012.

Transmission Planning:
In parallel with the above projects and activities, TVA's Transmission Reliability Engineering and Controls organization is developing and implementing transmission studies to ensure that as older coal plants are withdrawn from service, adequate transmission resources are in place to ensure continued reliable operation of supply.

HYDRO EFFICIENCY

The table below accounts for both completed and on-going projects at TVA hydro plants in FY2012. These projects are aimed at increasing overall hydro efficiency by reducing energy consumption, maintaining plant availability, lowering maintenance costs and increasing megawatt capacity. They also support environmental stewardship in that environmental impacts are included as part of the project development process. In addition, by maximizing hydro efficiency, TVA is able to burn less fossil fuel thereby reducing the amount of carbon released into the atmosphere.

TVA has engaged in modernizing its hydroelectric facilities to increase capacity and efficiency while maintaining the long-term reliability of its units. Since 1992, projects at 54 conventional hydro units have been completed at a total cost of $443 million. The projects have yielded capacity gains of 420 megawatts and an average efficiency gain of 5.1 percent. The next project is set to begin at Watts Bar Dam's Unit 4 in February 2012. Future projects will be funded as equipment conditions dictate the need for unit rehabilitation. There are 36 units remaining to be rehabilitated that have potential for capacity increases.

HYDRO ENERGY PROJECTS COMPLETED IN FY 2012

Plant Name	Project Name	Cost ($000's)
Hydro System	Modernization Program	15,537
Hydro System	Asset Preservation/Recovery Projects	37,372
Hydro System	Regulatory/Commitment Projects	13,975
Hydro System	Safety/Fire Protection Projects	7,805
	Total All Projects	74,689

NUCLEAR EFFICIENCY

TVA Nuclear considers energy efficiency and environmental impacts for each project and activity. The following is a list of energy management and sustainability projects completed in FY 2012, and a list of energy management and sustainability projects in progress, or planned for future implementation at TVA Nuclear plants.

NUCLEAR ENERGY PROJECTS COMPLETED IN FY 2012

Plant Name	Project Name	Cost ($000's)
Browns Ferry	Purchase critical pump motor spares. Improves motor efficiency.	6,321
Browns Ferry	Unit 1. Unit 2, & Unit 3 circulating cooling water motor replacement. Improves motor efficiency.	2,100
Brown Ferry	Replace portions of the U2 condenser tube cleaning system. Improves steam cycle efficiency (Heat Rate).	4,104
Browns Ferry	Replace all PCB containing electrical devices. Environmental impact.	3,471
Sequoyah	Spare auxiliary feedwater pump motor replacement. Improves motor efficiency.	420
Watts Bar	Replace 4 ice condenser glycol chillers. Environmental impact. Replacement of non-ozone depleting refrigerants.	3,657
	Total All Projects	20,073

NUCLEAR ENERGY PROJECTS IN PROGRESS IN FY 2012, OR PLANNED FOR FUTURE IMPLEMENTATION

Plant Name	Project Name	Cost ($000's)
Bellefonte	Complete and startup Bellefonte U1 (1200 MWe). Provides additional capacity.	4,900,000
Browns Ferry	Increase Unit 2 and 3 electrical output 110 MWe per unit. This project is on hold.	306,284
Browns Ferry	Increase Unit 1 electrical output by 110 MWe. This project is on hold.	33,200
Browns Ferry	Replace Unit 3 control bay chillers. Removes ozone depleting refrigerant.	13,119
Browns Ferry	Off-gas chiller replacement. Removes ozone depleting refrigerant.	4,378
Browns Ferry	2A low pressure turbine rotor modification & blade replacement. Improves turbine efficiency.	14,131
Browns Ferry	3A low pressure turbine rotor modification & blade replacement. Improves turbine efficiency.	11,392
Browns Ferry	3B low pressure turbine rotor modification & blade replacement. Improves turbine efficiency.	10,500
Browns Ferry	Residual heat removal motor replacement. Improves motor efficiency.	8,236
Browns Ferry	Residual heat removal service water motor replacement. Improves motor efficiency.	2,676
Browns Ferry	Raw cooling water motor replacement. Improves motor efficiency.	3,022
Browns Ferry	Control Rod Drive Motor Replacement. Improves motor efficiency.	903

Plant Name	Project Name	Cost ($000's)
Browns Ferry	Containment spray motor replacement. Improves motor efficiency.	5,098
Browns Ferry	Cooling tower lift pumps. Improves Efficiency.	4,200
Browns Ferry	Cooling tower lift pump motors. Improves motor efficiency.	2,400
Browns Ferry	Replace Cooling Tower #3. Improves the heat removal and thermal efficiency.	17,916
Browns Ferry	Replace Cooling Tower #5. Improves the heat removal and thermal efficiency	22,289
Sequoyah	Cooling tower lift pump & motor replacement. Improves motor efficiency.	1,200
Sequoyah	Main generator rewind. Improves generator efficiency. Not in NPG portfolio.	4,231
Sequoyah	U1 main generator voltage regulator upgrade. Improves generator efficiency.	5,011
Sequoyah	U2 main generator voltage regulator upgrade. Improves generator efficiency.	3,145
Sequoyah	Main generator bushing replacement. Improves generator efficiency.	550
Sequoyah	Spare "A" low pressure turbine rotor modification & blade replacement. Improves turbine efficiency.	3,820
Sequoyah	Improve Unit 2 heat rate by replacing the steam generators to start in Oct. 2012. Expected completion Jan 2013.	296,432
Sequoyah	PCB transformer replacement/ retrofill. Environmental impact.	16,131
Sequoyah	Rebuild 6 essential raw cooling water pumps. Improves pump efficiency.	5,040
Sequoyah	Replace 480V board room chiller. Removes ozone depleting refrigerant.	3,655
Sequoyah	Replacement of glycol chillers. Removes ozone depleting refrigerant.	9,571
Watts Bar	Replace safety related chillers. Removes ozone depleting refrigerant. Project in-progress, project is 30% completed.	29,030
Watts Bar	Convert non-safety related Aux Bldg. General Vent Chillers to non-ozone depleting refrigerants. In progress and project is 40% complete. Refrigerant has been removed from the AB GV Chiller Train "A". 60% completed.	2,387
Watts Bar	Complete and startup Watts Bar Unit 2 (1200 MWe). Provides additional capacity. This project has been pushed out to 2015.	4,500,000
Watts Bar	Replace WBN Station Air Compressors A, B, & C and controllers. Improves system efficiency by air consumption reduction by utilizing an energy management air-dryer.	1,820
Watts Bar	WBN CRDM Room A/C Unit replacement. Replacement of non-ozone depleting refrigerants.	1,200
Watts Bar	WBN re-design of CO2 system for the U1 Aux Instrument Room. Replacement of non-ozone depleting refrigerants.	800

Plant Name	Project Name	Cost ($000's)
Watts Bar	480V chiller upgrade. Replacement of non-ozone depleting refrigerants.	975
Watts Bar	WBN In Core Instrument Room Chiller Replacement.	800
Watts Bar	Raw cooling water pump motor upgrades. Improves motor efficiency.	1,715
Watts Bar	Aux control air-dryer and compressor replacement and adding 3rd compressor. Improves system efficiency by air consumption reduction by utilizing an energy management air-dryer.	6,125
Watts Bar	Replacement of nitrogen skid. Efficiency gain.	515
	Total All Projects	10,253,897

TVA has made a commitment towards obtaining United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) certification for new permanent buildings constructed on site plus obtaining LEED certification for many of the existing buildings that will be renovated. Other items being considered to create a more sustainable site are:

- Use of low emission construction materials, CCPs (Coal combustion products), and photovoltaic electric vehicle recharging stations
- Energy efficiency - lighting, HVAC along with efficiency improvements to other building systems
- Open spaces - avoid or minimize development of the undisturbed portions of the site
- Provide the necessary facilities and equipment for an efficient site recycling program

In FY 2012, the Energy Efficiency & Demand Response group worked with NPG internal stakeholders to develop and identify energy efficiency measures within the nuclear sites. All projects were evaluated by the EEDR group for the best projects based on project value, confidence of project completion, confidence of energy savings, and documentation. The completed and projected projects are included elsewhere in this report.

COAL AND GAS EFFICIENCY

Fossil Power Group (FPG) considers energy efficiency and environmental impacts in the evaluation of each project. FPG continues to focus on reducing the number of forced outages and load reductions at its coal-fired power plants, combined cycle plants and combustion turbine sites. Improving system-wide performance means fewer generating unit startups which improves unit operational efficiency and helps reduce the overall delivered cost of power.

TVA has a long record of improving air quality and is continuing to invest in cleaner energy. Air quality across the TVA region, including the Smoky Mountains, is the best it has been in more than 30 years, according to the Environmental Protection Agency, and is getting better.

In August 2010, the TVA Board of Directors adopted a new vision for TVA to be one of the nation's leading providers of low-cost and cleaner energy by 2020. To achieve that vision, TVA will focus on increased nuclear generation, cleaner air and greater energy efficiency.

In 2012, about 50 percent of TVA's energy came from clean or carbon-free sources – nuclear, hydro and renewable power. To meet the vision for 2020, TVA will be focusing on a more balanced portfolio in the future, with more reliance on nuclear and gas generation, less reliance on coal-fired generation and expansion of renewable and energy efficiency programs.

TVA has already invested more than $5.4 billion since 1977 to reduce coal-fired power plant emissions. These investments have resulted in reductions of sulfur dioxide (SO_2) emissions by 94 percent since 1977 and nitrogen oxides (NOx) emissions by 89 percent since 1995.

TVA now anticipates spending approximately $ 2.3 billion through 2018 to add controls to its coal-fired units, which is less than the previous projection of $3.4 billion. This results from increasing reliance on cleaner energy resources and the idling/retirement of more coal-fired units which otherwise would have had to have been controlled.

TVA will further reduce air emissions from its coal fleet by converting to biomass, idling or retiring about 2,800 megawatts of coal-fired capacity, or 21 of its 59 coal units, by the end of 2017. This includes one unit at Shawnee, four at John Sevier, ten at Johnsonville and six at Widows Creek fossil plants. Units were chosen based on age, efficiency, performance, operating costs and cost to bring them into compliance with anticipated environmental regulations.

Currently, TVA has approximately 9,200 megawatts of gas capacity with the completion of the 880 megawatt John Sevier Combined Cycle Plant. Gas burns with almost no emissions and is an economical way to provide a cleaner, more flexible source of energy to the Valley.

Many energy management and related environmental projects were completed at TVA Fossil plants during FY 2012. These projects included heat rate improvements, maintaining plant availability, reducing energy consumption, lowering maintenance costs, environmental stewardship, and increasing overall efficiency.

FOSSIL PROJECTS COMPLETED IN FY 2012

Plant Name	Project Name	Cost ($000's)
Allen Fossil Plant	FPG CAP ALF TS Dust Collector & Supply System.	2,962
Allen Fossil Plant	FPG ALF CAP Tier 1 Cl Yard DCS.	110
Allen Fossil Plant	FPG CAP ALF U3 replace HMI	690
Allen Fossil Plant	FPG CAP ALF U1 replace HMI ALF294.	695
Allen Fossil Plant	FPG CAP ALF U1 Vestibule.	5,802
Allen Fossil Plant	FPG CAP ALF U1 SLG Tank Vent System.	788
Allen Fossil Plant	FPG CAP ALF RPL MRNG Cell 12.	801
Allen Fossil Plant	FPG CAP ALF Replace Crusher Motor B.	395
Allen Fossil Plant	FPG ALF CAP U2 Replace HMI.	2,279
Allen Fossil Plant	FPG CAP ALF U3 SCR CAT Layer.	1492
Bull Run Fossil Plant	FPG CAP BRF B BFPT Diaph. & Carr.	2059
Bull Run Fossil Plant	FPG BRF CAP pulverizer upgrade.	951
Bull Run Fossil Plant	FPG BRF CAP replace SS air compressor.	2151
Colbert Fossil Plant	FPG CAP COF U4 SH/RH DESPRHTRS.	1519
Colbert Fossil Plant	FPG CAP COF U4 TURB Valve Replacement.	511
Colbert Fossil Plant	FPG CAP COF U1 Refurbish HP Rotor.	3361
Colbert Fossil Plant	FPG CAP COF Barge Unloader #1.	8370
Colbert Fossil Plant	FPG CAP COF--2A Pulverizer Rebuild.	429
Colbert Fossil Plant	FPG CAP COF--1B Pulverizer Rebuild.	382
Colbert Fossil Plant	FPG CAP COF U1 1A Boiler Feedpump.	450
Colbert Fossil Plant	FPG CAP COF Barge Unloader #2.	258

Plant Name	Project Name	Cost ($000's)
Cumberland Fossil Plant	FPG CUF CAP U1 Replace Bottom ASH.	17267
Cumberland Fossil Plant	FPG CUF CAP U1 Replace APH Basket.	8684
Cumberland Fossil Plant t	FPG CUF CAP U1 Replace FGD Wet/Dry.	5279
Cumberland Fossil Plant	FPG CUF CAP U1 Replace FGD Guillo.	811
Cumberland Fossil Plant	FPG CUF CAP U1 Scrub FRP Spray.	7859
Cumberland Fossil Plant	FPG CUF CAP U1 Replace Precip Ctrl.	2384
Cumberland Fossil Plant	FPG CAP CUF U1 Decontic In DCS.	4490
Cumberland Fossil Plant	FPG CAP CUF U1 SEC SH Inlet EL.	37467
Cumberland Fossil Plant	FPG CAP CUF U1 CNTRL/STP VAL R.	2275
Cumberland Fossil Plant	FPG CAP CUF U1 Refurb FDT 1B.	1666
Cumberland Fossil Plant	FPG CAP CUF U1 Lagging Insul.	10668
Cumberland Fossil Plant	FPG CUF CAP TS RP TSFR C Chute.	790
Cumberland Fossil Plant	FPG CAP CUF Chute Replacement.	747
Cumberland Fossil Plant	FPG CAP CUF Replace Trans. D Chutes	579
Cumberland Fossil Plant	FPG O&M PROJ CUF U1 SCR CAT.	4073
Gallatin Fossil Plant	FPG CAP GAF U3 Gen. Rot. Rewind.	3600
Gallatin Fossil Plant	FPG CAP GAF U3 Low NOX Brnrs.	480
Gallatin Fossil Plant	FPG CAP GAF U3 Rewind Gen. Stator.	6812
Gallatin Fossil Plant	FPG CAP GAF U3 Retube Main Condenser.	2193
Gallatin Fossil Plant	FPG CAP GAF-U3 Replace APH basket.	328
Gallatin Fossil Plant	FPG CAP GAF-U3 Boiler Cleaning System.	1128
Gallatin Fossil Plant	FPG GAF CAP TIER A U3 LP Heater C.	517
Gallatin Fossil Plant	FPG CAP GAF U1 Replace voltage regulator.	368
Gallatin Fossil Plant	FPG CAP GAF 25 MVA USST.	862
Johnsonville Fossil Plant	FPG CAP JOF Mooring Cell 1.	264
Kingston Fossil Plant	FPG CAP KIF U2 Replace condenser tubes.	1378
Kingston Fossil Plant	FPG CAP KIF TIER 1 U4 Cond-001.	130
Kingston Fossil Plant	FPG KIF CAP-Instl. Blanking Plt.	2864
Kingston Fossil Plant	FPG CAP KIF-Intgted. Draft Cntr.	650
Kingston Fossil Plant	FPG CAP KIF U2-ESP Field #4.	801
Kingston Fossil Plant	FPG CAP KIF U4-ESP Field #4.	658
Kingston Fossil Plant	FPG CAP KIF U9 DCS Standard.	3913
Kingston Fossil Plant	FPG CAP KIF U7 Replace RH Roof TBE.	1331

Plant Name	Project Name	Cost ($000's)
Kingston Fossil Plant	FPG CAP KIF U7 Replace SH Roof TUB.	1322
Kingston Fossil Plant	FPG CAP KIF Raw Water BRD #2.	1659
Kingston Fossil Plant	FPG CAP KIF U9 Coal Burner replacement.	600
Kingston Fossil Plant	FPG CAP KIF Tier 1 Chemical Lab-001.	275
Kingston Fossil Plant	FPG CAP KIF 20MVA USST.	1125
Paradise Fossil Plant	FPG CAP PAF U1 Replace AH CSB1-4.	3778
Paradise Fossil Plant	FPG CAP PAF U1 Replace SCR controls.	4080
Paradise Fossil Plant	FPG CAP PAF U1 Replace SCR Agtr.	952
Paradise Fossil Plant	FPG CAP PAF U1 Air HTR/EXP Joint.	7122
Paradise Fossil Plant	FPG CAP PAF U2 Cold Side Bays.	5577
Paradise Fossil Plant	FPG CAP PAF U2 Replace Boiler Sidewall.	4617
Paradise Fossil Plant	FPG CAP PAF U2 SCRB Agtr Side Mt.	839
Paradise Fossil Plant	FPG CAP PAF U3 IK HND Monorail.	1444
Paradise Fossil Plant	FPG CAP PAF Main Transformer.	4145
Paradise Fossil Plant	FPG O&M PROJ PAF U1 Cat. Regen.	1447
Shawnee Fossil Plant	FPG CAP SHF U3 Baghouse.	847
Shawnee Fossil Plant	FPG CAP SHF Replace 4KV Feed.	1180
Shawnee Fossil Plant	FPG CAP SHF 7B Pulverizer Rebuild.	328
Shawnee Fossil Plant	FPG CAP SHF 20 MVA USST.	696
Widows Creek Fossil Plant	FPG CAP WCF U8 SCR Reheat IK Replacement.	315
Widows Creek Fossil Plant	FPG CAP WCF Tier 1 Condens-001.	93
Widows Creek Fossil Plant	FPG WCF CAP TIER A U7 RPL -001 (HP Htr Drain Reg).	70
Widows Creek Fossil Plant	FPG CAP WCF U7 7C ID Fan Rotor.	579
Widows Creek Fossil Plant	FPG WCF CAP AGC.	423
Various Fossil Plants	FPG CAP AGC-Fossil Project.	6681
Caledonia Combined Cycle Plant	FPG CAP CCC U3 Compresor Upgrade.	7946
Caledonia Combined Cycle Plant	FPG CAP CCC U3 S17 Blade Replacement.	898
	Total All Projects	228,809

FOSSIL PROJECTS ONGOING

Plant Name	Project Name	Cost ($000's)
Allen Fossil Plant	FPG ALF CAP Inst. EDTA Blr. Clng.	5912
Allen Fossil Plant	FPG ALF CAP Tier A U2 #8 HP HT.	542
Allen Fossil Plant	FPG ALF CAP Replace 11TH Flr MCC.	1085
Allen Fossil Plant	FPG ALF U2 SCR CAT Layr. Bottom.	240
Bull Run Fossil Plant	FPG BRF CAP Replace Precipitator Wires.	2897
Bull Run Fossil Plant	FPG BRF CAP Rewind 1H Generator Stator.	3178

Plant Name	Project Name	Cost ($000's)
Bull Run Fossil Plant	FPG CAP BRF Auxiliary Boiler Improvement.	1373
Colbert Fossil Plant	FPG COF CAP Tier A U4 Replacement -001.	1826
Colbert Fossil Plant	FPG COF CAP U3 Gravimetric Coal Feeders.	247
Colbert Fossil Plant	FG COF CAP5F1 Pulverizer Rebuild.	187
Cumberland Fossil Plant	FPG CAP CUF U1 Control/STP VAL R.	15672
Cumberland Fossil Plant	FPG CAP CUF U2 SEC SH Elements.	16207
Cumberland Fossil Plant	FPG CUF CAP U2 Replace Scrubber FRP HED 103084.	161
Cumberland Fossil Plant	FPG CUF CAP U2 Replace FGD Wet/Dry – 103086.	5871
Cumberland Fossil Plant	FPG CAP CUF U2 DCS Migration.	4302
Cumberland Fossil Plant	FPG CAP CUF U2 UPGRADE IDF LCI	121
Cumberland Fossil Plant	FPG CAP CUF U2 Replace Main Transformer.	6064
Cumberland Fossil Plant	FPG CAP CUF U1 DCS Migration.	316
Cumberland Fossil Plant	FPG CAP CUF U2 Lagging Insulation.	6491
Cumberland Fossil Plant	FPG CAP CUF Spare IP Turbine.	5781
Cumberland Fossil Plant	FPG CAP CUF U1 Replace SCR Pump.	1181
Cumberland Fossil Plant	FPG CAP CUF U2 Replace SCR Pump.	1240
Cumberland Fossil Plant	FPG CAP CUF U2 CAT Layr. Bottom.	3675
Cumberland Fossil Plant	FPG CUF U1 SCR CAT Layr. Middle.	1652
Kingston Fossil Plant	GEN COG CAP KIF U1 Condenser Retubes.	558
Kingston Fossil Plant	GEN COG CAP KIF U3 Condenser Retubes.	423
Kingston Fossil Plant	FPG CAP KIF USST.	192
Paradise Fossil Plant	FPG CAP PAF U3 SCR Catalyst.	2614
Paradise Fossil Plant	FPG PAF CAP U3 Replace HP Heaters.	3039
Paradise Fossil Plant	FPG CAP PAF U3 Voltage Reg.	64
Paradise Fossil Plant	FPG CAP PAF U1 Replace Boiler Sidewall.	302
Paradise Fossil Plant	FPG O&M PROJ PAF U1 SCR Bottom.	675
Shawnee Fossil Plant	FPG CAP SHF Weld/Rewind Rotor.	1329
Shawnee Fossil Plant	FPG SHF CAP 250V DC STA Ctrl B.	462
Widows Creek Fossil Plant	FPG CAP WCF U7 Rewind 7L Generator Stator.	3874
Widows Creek Fossil Plant	FPG CAP WCF U8 Sonic Horns.	335
Widows Creek Fossil Plant	FPG CAP WCF U7-8 Ins. Simulator.	3318
Widows Creek Fossil Plant	FPG WCF CAP Tier A U8 Replace -001 U8 IRs/IKs	852

Plant Name	Project Name	Cost ($000's)
Widows Creek Fossil Plant	FPG CAP WCF U7 Replace SCR Reheat.	457
Widows Creek Fossil Plant	FPG WCF U8 Catalyst Regen.	712
Widows Creek Fossil Plant	FPG O&M PROJ WCF U7 SCR Bottom.	155
Caledonia Combined Cycle Plant	FPG CAP CCC U2 Compr. Upgrade.	5276
Gallatin Comb Turbine Plant	GCT U3 Generator Rotor Rewind.	708
Gallatin Comb Turbine Plant	GCT U4 Generator Stator & Rotor Rewind.	1145
Magnolia Combined Cycle Plant	MCC Gas Supply Reconfig.	137
Magnolia Combined Cycle Plant	MCC U1 HGPI.	2372
System Coal Supply	FPG CAP FOS Weighing Recovery.	1987
	Total All Projects	117,207

In 2012, the Energy Efficiency & Demand Response group worked with FPG internal stakeholders to develop and identify energy efficiency measures within generation sites and office complexes. All energy savings were tracked and documented to maintain credibility, ensure repeatability and share lessons learned with the fleet. Below is a summary document of these savings. All projects were submitted to a panel. The panel evaluates the best projects based on project value, confidence of project completion, confidence of energy savings, and documentation. The projects must be installed in plants, buildings or systems that have greater than 5 year remaining life and can be submitted for lighting, HVAC, weatherization, appliances and building management control systems, auxiliary power plant equipment (fans, pumps, motors, VFD's, compressed air).

Site	Description	Total Cost w/ Project Management Cost Included	Energy & Water Savings	Kwh Savings
Paradise Fossil Plant	Upgrade Unit 1 ID Fans and Ductwork	$3.5M	1,334,616	20,532,555
Paradise Fossil Plant	Upgrade Unit 2 ID Fans and Ductwork	$3.5M	1,112081	17,108,934
Bull Run Fossil Plant	Upgrade Three Station Service Air Compressors	$2.4M	111,267	1,711,804
	Total All Projects	$9.4M	2,557,964	39,353,293

3. **Non-Fleet Vehicle and Equipment Fuel Use:** Refer to the Data Report to identify the fuel use for non-fleet vehicles and other equipment not captured by the Federal Automotive Statistical Tool (FAST) reporting system. Discuss trends pertaining to this category of fuel use and methods employed to reduce fuel use for non-fleet vehicles and other equipment not captured by the FAST reporting system:

FLEET FUEL EFFICIENCY

TVA's intent is to purchase the most economically and fuel efficient vehicle that will achieve the requirements for the vehicle's intended function and carryout TVA's mission. In FY 2012, TVA added 5 hybrid gas/electric vehicles, 1 electric vehicle, and 257 E85 vehicles to its fleet bringing the total number of hybrid vehicles to 51, electric vehicles to 5, and E85 vehicles to 720.

During FY 2012, TVA gasoline fuel usage under FAST (Federal Automotive Statistical Tool) reporting was 2,739,790 gallons of gasoline, 813,276 of diesel fuel, and 8,213 gallons of E85 and 6,384 Kwh of electricity. For more information see Attachment 1.

TVA vehicles <8500 GVWR and associated fuel usage will be included on the OMB Scorecard and reported in the Annual Report.

In FY 2012 TVA reached an agreement with OMB to include its applicable light duty fleet towards meeting the fleet petroleum reduction goal and alternative fuel use goal. TVA has updated its FAST data from FY 2005 through FY 2012 to account for this change. Adding this additional energy use to the target side of GHG accounting required TVA to update its FY 2008 base.

VEHICLE FUEL EFFICIENCY OUTREACH PROGRAMS

TVA encourages employees to use mass transit systems, vans for group travel and car pools, when available and feasible. TVA supports through incentives a ride share program and a mass transit program resulting in more usage of the programs. The use of coordinated TVA and vendor delivery, pickup routing schedules and just-in-time delivery is utilized throughout TVA. This coordinated effort reduces deadheading and avoids double handling and multiple trips to the same sites.

TVA continues its practice in FY 2012 of implementing information technologies that enabled employees to perform their jobs more efficiently while also saving energy. Since the TVA service area covers all of Tennessee and portions of six other states, employees are widely dispersed and often need to meet with others in different work locations. In recent years technologies have been implemented which enable employees to travel less and conduct more meetings from their remote work sites, therefore saving fuel and related travel expenses. The use of such collaborative technologies increased in FY 2012.

- **Unified Conferencing – TVA, as part of a larger Unified Communications project, implemented Unified Conferencing in the second quarter of 2011, bringing together audio and video conferencing into a unified system that allows greater flexibility in conferencing services. TVA continued unified conferencing in FY 2012. The system also replaces two obsolete platforms while increasing system capacity by a factor of 3. As a "reservationless" system, it also better utilizes video and audio conferencing resources.**
- **Audio Conferences and Video Conferences - TVA internally hosts an average of 1,219 audio conferences and 66 video conferences each week. This number is consistently growing as sites are added to the video conferencing network.**

HEAVY EQUIPMENT

TVA's Heavy Equipment continued using a fuel system with small compressors to kill bacteria and spores that grow in fuel that is stored for long periods of time. Its use should decrease the amount of contaminated fuel that has to be disposed. These units can also eliminate down-time due to filter and fuel injector plugging. TVA's maintenance shops use filter crushers to get all possible oil out of filters before disposal. TVA's maintenance facilities are using oil burners to heat their facilities using TVA's generated used oil.

TVA has begun to use super high-efficiency air filters on its heavy equipment, as available. The cost is about 15-20% higher, but the life of the filters is about 300% longer. These projects provide TVA with the benefits of reduced potential of adverse environmental impacts from spillage of waste oil and fuel, increased operational efficiency, increased availability of units, and decreased cost due to reduction in oil consumption. TVA incorporates EPA emission standards in specifications for both on-road and off-road trucks. TVA also is in constant communication with equipment providers on their emission standards and latest engine components to insure the best and most economical equipment is used.

FEDERAL VEHICLE FUEL EFFICIENCY

The following tables show a comparison of TVA's annual mileage and miles per gallon (mpg) performance for sedans and light trucks from FY 1975 through FY 1980 compared to FY 2012.

ANNUAL MILEAGE

FY	Miles Driven		Percent Increase/(Decrease)	
	Sedans	Trucks*	Sedans Base Yr. 75	Trucks* Base Yr.79
75	12,222,850	N/A	0	N/A
76	14,698,600	N/A	20	N/A
77	14,331,650	N/A	17	N/A
78	14,101,300	N/A	15	N/A
79	13,779,900	25,947,000	13	0.0
80	14,788,300	25,989,000	21	0.2
08	10,115,925	32,345,951	(17)	25
09	9,683,301	32,916,339	(21)	27
10	9,549,205	33,631,621	(22)	30
11	9,006,690	34,708,558	(26)	34
12	9,570,307	34,438,024	(22)	33

*Figures for Trucks include both light duty (<8500 lbs GVWR) & medium duty (8501 – 16000 lbs GVWR).

MPG PERFORMANCE

FY	Annual MPG			Percent Increase/(Decrease)		
	Sedans Base Yr. 75	Trucks* Base Yr. 79		Sedans Base Yr. 75	Trucks* Base Yr. 79	
		4 x 2	4 x 4		4 x 2	4 x 4
75	15.1	N/A	N/A	0	N/A	N/A
76	15.0	N/A	N/A	(1)	N/A	N/A
77	15.6	N/A	N/A	3	N/A	N/A
78	16.2	N/A	N/A	7	N/A	N/A
79	16.3	11.6	8.2	8	0	0
80	17.9	12.0	8.3	19	3	1
08	27.3	15.4	13.2	81	33	61
09	27.8	14.7	12.7	84	27	55
10	25.6	14.0	12.3	70	21	50
11	27.1	14.0	12.5	79	21	52
12	31.9	14.2	12.4	111	22	51

*Figures for Trucks include both light duty (<8500 lbs gross vehicular weight rating (GVWR)) & medium duty (8501 - 16000 lbs GVWR)

B. Renewable Energy

Discuss agency's policy and efforts to encourage the purchase and generation of electricity and thermal energy from renewable energy sources. The quantitative information related to this section will be reported on the agency's Data Report:

RENEWABLE ENERGY

In addition to its hydroelectric facilities, TVA's owned assets include 16 small solar sites, 8 MW digester gas co-firing capacity, and biomass co-firing capability at its coal-fired sites. On September 30, 2012 TVA was a party to nine power purchase contracts with eight Midwest wind farms. As of September 30, 2012, energy was provided to TVA under seven of the nine contracts. Six of the nine contracts provide TVA with renewable wind energy from 850 MW (nameplate capacity). An additional one of the nine contracts provides 300 MW for a twenty-year term, but TVA currently does not purchase the renewable attributes for this energy although it has the opportunity to obtain them in the future. Additionally, the remaining two 20-year wind contracts that had not yet begun delivering power as of September 30, 2012 will provide up to an additional 365 MW (nameplate capacity) of renewable energy with deliveries beginning in FY2013. TVA also purchases renewable energy from many other small renewable energy facilities located in the TVA valley through dispersed power purchase agreements and renewable energy purchase programs (Generation Partners, Green Power Providers, the Renewable Standard Offer, and Solar Solutions Initiative).

GREEN POWER SWITCH® (GPS)

TVA and 12 public power companies launched GPS on Earth Day, April 22, 2000. GPS was the first green power program offered in the Southeast and provided consumers with an economical opportunity to participate in TVA's development of renewable energy resources. The program originally included supply from wind and solar energy sources.

The program was expanded in FY 2001 to include electricity generated from methane gas at a wastewater treatment plant in Memphis, Tennessee. This 8 MW methane gas project is located at TVA's Allen Fossil plant. Sixteen solar generating facilities are presently operating in Tennessee, Kentucky, Alabama, Virginia and Mississippi. A commercial scale wind power generation site, including 18 wind turbines, operates on Buffalo Mountain in Anderson County, Tennessee. The capacity of these wind units is 29 MW.

Under the GPS program, residential customers can purchase green power in blocks of 150 kilowatt-hours each per month, at a cost of an additional $4.00 per block. These blocks represent approximately 12 percent of a typical home's monthly energy use. Commercial and industrial customers can sign up for the 150 kilowatt-hour blocks based on the amount of energy they use each month. When two blocks of GPS are purchased each month for one year, the associated environmental benefits are equivalent to the carbon emissions from 352 gallons of gasoline[1]. In calendar year 2012 two new Green Power Switch product options were tested in 6 power company regions. Green Power Switch Pure Solar is a 100% solar option sold in 50 kilowatt-hour blocks for $8 each. Green Power Switch Southeastern RECs is a high volume option for commercial and industrial customers. Each megawatt-hour is sold for $3, with a minimum annual purchase of 2,000 megawatt-hours.

As of September 30, 2012, residential customers were purchasing 4,418 Green Power Switch blocks and 262 Pure Solar blocks and business customers were purchasing 13,324 Green Power Switch blocks and 2 Pure Solar blocks each month. Two customers were purchasing a combined 7,000 megawatt-hours through Southeastern RECs. Combined sales for the three Green Power Switch options were 12,675 megawatt-hours of renewable energy each month. One hundred eighteen power companies participate in the GPS program.

[1] Source: EPA Green Power Equivalency Calculator

RENEWABLE ENERGY TECHNOLOGY MONITORING

TVA Technology Innovation (TI) and Renewable Energy Program organizations identify and evaluate emerging clean and renewable energy technologies in support of its strategic needs. The clean and renewable energy technology program provides information to inform policy, monitors advancements in renewable energy technologies to keep TVA organizations and customers informed on technology issues, and demonstrates and develops the most viable technologies in the areas of biomass, wind, solar, and other clean and renewable resources.

Current TI projects include the Melton Hill Dam Sustainable Recreation Area Demonstration. This is an innovative project which integrates multiple new and emerging renewable energy, energy efficiency, and water conservation technologies in a retrofit of an existing recreation area to showcase and demonstrate how sustainable technologies can create an eco-friendly recreation environment. Technology demonstrations at the site include solar photovoltaic (PV) installations, solar and heat pump water heating, small wind electric vehicle charging, solar and grid connected LED lighting, high efficiency HVAC, coal combustion product reuse, recycling, water efficiency, and storm water management techniques.

TI recently completed the development and integration of a public accessible dashboard for monitoring real-time performance of the technologies installed. The resulting data will be compared against site historical base line data to determine the environmental and energy savings benefits of the sustainability project.. Annual technology transfer tours will be conducted with interested stakeholders and the public at large.

Solar:
TI plans to demonstrate innovative smart solar panels that not only generate renewable energy, but also monitor the grid and provide grid support when necessary. These new panels are designed to be mounted separately on small structures like utility poles throughout the grid to provide multiple benefits in numerous locations. The project will evaluate the integration benefits and assess increased efficiency, grid and voltage support benefits of the new solar panels.

In response to TVA's Agreement with the EPA, TVA is developing several solar photovoltaic projects.

TVA co-sponsored the 2012 Tennessee Valley Solar Solutions Conference for solar stakeholders in the TVA region.

Biomass:
Biomass is the most abundant renewable resource in the TVA region and consists of naturally occurring and replenishing organic materials. Some examples of biomass include landfill gas, dedicated energy crops such as switchgrass, agricultural waste, and mill residues such as sawdust. Biomass can be used to generate clean energy in a number of technologies including gasification and combustion.

There are numerous regulatory, economic, and technical challenges associated with biomass. TVA is working with EPRI and other utilities to understand the carbon neutrality issue with biomass to mitigate the current technical challenges facing biomass power technologies.

TVA is a partner in a national comprehensive study of the impacts of competing demands on biomass resources that will result from the use of biomass for biofuels and biopower applications. The study is being conducted by the National Renewable Energy Laboratory and EPRI, and it will also evaluate life cycle carbon impacts of biomass.

TVA is participating in a new project with Portland General Electric (PGE), EPRI and other utilities that will evaluate the economics and technical feasibility of manufacturing, transporting, and cofiring torrefied biomass at PGE's Boardman Fossil Plant. Torrefied biomass is an innovative high heating value renewable biomass fuel that looks promising as a "drop in" clean fuel alternative to coal.

Combined Heat and Power (CHP) and Waste Heat Recovery (WHR):
CHP and WHR technologies produce clean, non-carbon emitting energy. They also increase energy efficiency and since they are usually located at the end-user's site, they can provide benefits to the transmission grid.

CHP is the concurrent production of electricity and thermal energy from a single fuel source (natural gas, biomass, coal, etc). WHR is the capture of waste heat that an industrial facility is already emitting, and turning it into clean electricity.

TVA recently completed CHP/WHR assessments at a number of large direct serve customers. The assessments provided economic and technical feasibility information to the customers to be used for their long term energy usage planning.

RENEWABLE ENERGY

1. **On-Site generated renewable energy.** Highlight specific recent projects related to energy use from electricity generated on-site from renewable sources and renewable energy thermal projects. If applicable, discuss energy generated on Federal or Indian lands, but which may be sold to other parties:

   In 2003, TVA launched the Generation Partners pilot program that supports homeowners and businesses that want to install small-scale renewable generating systems up to 50 kilowatts in size. The program also supplies TVA's Green Power Switch® program with renewable power, making more green power available to consumers and creating a market for green power generation. On October 1, 2012, the Generation Partners pilot program was replace by a long-term, sustainable program called Green Power Providers.

   In FY 2012 TVA's renewable installations at Melton Hill Hydro plant site produced 33,816 KWH of solar and 229 KWh of wind. This site and ongoing performance can now be monitored remotely via a web site.

2. **Purchased renewable energy.** Discuss highlights of major purchases and approaches taken to obtain renewable energy through purchases:

   The renewable energy purchased for the Knoxville Office Complex, Chattanooga Office Complex, and Huntsville office building was 1,170 MWh, TVA also purchases hydroelectric power through stand-alone contracts and its Generation Partners (GP) program. TVA purchases wind energy from Midwest wind farms, a stand-alone contract in the Tennessee Valley (TV), and its GP program. One Midwest wind farm provides generic energy. TVA purchases solar energy through its Renewable Standard Offer (RSO), Solar Solutions Initiative, its GP program, and a stand-alone contract in the TV. TVA's biomass purchases are a stand-alone landfill gas facility, a RSO facility, and GP facilities. TVA's contracted renewable resources exceed 1,600 MW. TVA also purchases RECs for the compliance obligation of the four local power companies that sell TVA power in North Carolina.

3 **Water Conservation.** Highlight activities undertaken to improve water efficiency. In addition, summarize any agency-specific issues or obstacles related to the implementation of reduction strategies or the collection of water consumption data:

   During FY 2012, water surveys were conducted at multiple TVA sites covering 3.9 million square feet. TVA consumed 547.4 million gallons of potable water in FY 2012 with an estimated cost of $4 million. These numbers include water consumption from excluded buildings (see Attachment 2).

TVA considers water management plans as part of its operation and maintenance activities. As part of these activities, more than 275 facilities have been covered, representing over four million GSF. To date, TVA has uncovered projects, from covered facilities surveyed, with a potential water savings of 19.28 million gallons.

In addition to TVA's internal water saving measures, TVA is involved in projects designed to support efforts to reduce water resource impacts. These projects are being jointly funded and/or managed by TVA and include: Identification of technologies to increase water use efficiency and water conservation (EPRI); and Alternative water supply and use opportunities (e.g. using publicly owned treatment works (POTW grey water)).

TVA finished FY 2012 with a 31% reduction in Gal/GSF compared to its FY 2007 base year. A key component to this reduction was closing TVA's potable water plant at Muscle Shoals. TVA further reduced water through reduction of leaks and implementation of water efficiency improvements.

4. **Metering of Electricity Use.** Describe progress made in FY 2012 in meeting the milestones for the building metering requirements. If applicable, highlight plans for installing advanced meters:

   Under TVA's Metering Plan, funding for metering projects, including advanced meter installation, was established in FY 2009. To date 38 advanced meters have been installed on TVA facilities. TVA is still working to complete installation of 2 remaining meters.

5. **Federal Building Energy Efficiency Standards.** For all new Federal buildings owned, operated, or controlled by the Federal agency, for which designs were started since the beginning of FY 2007, provide a statement specifying whether the Federal buildings are expected to meet or exceed the Federal building efficiency standards. If they will not, provide an explanation of the obstacles:

   During FY 2012, TVA started work on five new building designs, all of which are expected to meet the Federal Building Energy Efficiency Standards.

III. IMPLEMENTATION HIGHLIGHTS OF FY 2012

The purpose of this section is to identify and describe results and accomplishments to reduce energy consumption and improve energy efficiency. Agencies should provide highlights of the following strategies their energy management programs employed during FY 2012:

A. Life-Cycle Cost Analysis
B. Retrofits and Capital Improvement Projects
C. Use of Performance Contracts
   - Energy-Savings Performance Contracts (ESPCs)
   - Utility Energy Services Contracts (UESCs).
   - Use of Other Types of Contracts
D. Use of ENERGY STAR® and Other Energy-Efficient Products
E. Sustainable Building Design and High-Performance Buildings
F. Energy Efficiency/Sustainable Design in Lease Provisions
G. Distributed Generation, including use on on-site renewable energy resources and combined cooling, heating, and power systems

TVA implements many energy management measures through a number of strategies which include the following:

ENERGY AND ENVIRONMNETAL SUSTAINABILITY COMMITTEE - This committee serves as a forum for sharing information and success stories on energy efficiency and sustainable efforts for application across the agency.

NEW CONSTRUCTION - TVA combines teams of designers to incorporate energy efficiency and sustainability at the start of new building designs. The Resource Efficient Building Design Process developed during FY 2006 and updated in FY 2012 ensures energy and sustainable requirements are considered.

RENOVATION - TVA takes advantage of renovation activities by incorporating energy efficiency and sustainability into spaces that are being reconfigured.

OPERATIONS & MAINTENANCE - Operation and maintenance (O&M) personnel are the front line workers who identify potential energy and sustainable problems and opportunities on a daily basis. O&M staff take corrective action where needed and seek help from engineering, energy and sustainable staff to resolve technical issues when necessary.

Examples of O&M activities include the efficient operation of buildings through energy management and control systems, the placement of controls on lighting and other energy consuming equipment, addition of insulation in buildings, replacement of old glazing with newer high efficiency glazing, and replacement of inefficient lighting when actions are determined to be life-cycle cost effective. In addition, TVA considers efficiency improvements in its industrial, power plant, and transmission operations when life-cycle cost effective.

As part of its operation and maintenance function, TVA has an emergency curtailment procedure which reduces energy use in its buildings during energy emergencies.

VEHICLE FUEL - TVA looks at its overall fleet and business needs to match the work needs of each individual to the most efficient vehicle. TVA investigates efficient vehicles such as hybrid cars and adds these vehicles to its fleet to meet business needs. TVA also investigates ways to extend the life cycle of vehicles, especially special purpose vehicles. TVA's detailed Fleet Management Strategy is provided as Attachment 4.

A. LIFE-CYCLE COST ANALYSIS:

TVA's Energy Plan provides that life-cycle analysis will be used in making investment decisions regarding energy/water efficiency and sustainable practices.

B. RETROFITS AND CAPITAL IM PROVEMENT PROJECTS:

In FY 2012, TVA implemented $8.9M dollars worth of improvements resulting in $890,900 dollars in annual savings, 10,480 MWh in energy consumption savings and 16,300,000 gallons in water consumption savings at both covered and non-covered facilities.

C. USE OF PERFORMANCE CONTRACTS:

Projects for facilities are primarily funded through renovation, operation, maintenance, and modernization efforts. Projects covered under general operations are ranked for economic benefit compared to other TVA projects to determine funding availability and implementation status and are funded mainly through the capital budgeting process. TVA considers the use of ESPCs and UESCs where cost-effective and in the best interest of the agency and its customers. During FY 2012, TVA did not utilize these financing mechanisms.

D. USE OF ENERGY STAR®AND OTHER ENERGY EFFICIENTPRODUCTS:

TVA's Energy Plan provides that TVA will strive, where cost-effective, to meet the ENERGY STAR® Building criteria for energy performance and indoor environmental quality in eligible facilities to the maximum extent practicable. This includes purchasing ENERGY STAR® and other energy-efficient products, when they are available, meet specifications and are cost effective.

E. SUSTAINABLE BUILDING DESIGN AND HIGH PERFORMANCE BUILDINGS:

During FY 2012, further design work and construction on new buildings for Bellefonte Nuclear Plant were put on hold pending the completion of all work at the Watts Bar Nuclear Plant. Construction is still ongoing at the 66,000 sf TVA In-Processing and Training Facility located near TVA's Bellefonte Nuclear Plant and is planned to be completed in early FY 2013. This building was designed to meet requirements for LEED Silver certification.

A number of additional new building designs were started in FY 2012. Their status is as follows:

1) **Cumberland Fossil Plant 360 sf guard/training building - incorporated applicable Sustainable Guiding Principle requirements. Construction is complete but sustainable guiding principle application still needs to be verified.**
2) **Bull Run Power Stores 6,000 sf Warehouse - incorporated applicable Sustainable Guiding Principle requirements including daylighting, energy efficient lighting, high levels of insulation all of which will enable it to also perform 30% better than the ASHRAE 90.1 energy code. This is a lighted and ventilated building. The design is complete and construction has started.**
3) **John Sevier 12,000 sf Admin and Maintenance building – incorporated applicable Sustainable Guiding Principle requirements including energy efficient lighting and HVAC, high levels of insulation all of which will enable it to also perform 30% better than the ASHRAE 90.1 energy code. Design is complete and construction has started.**
4) **Muscle Shoals 3,200 sf ESS Administrative Office building - incorporated applicable Sustainable Guiding Principle requirements and energy efficient improvements sufficient to perform 30% better than ASHRAE 90.1 energy code. Construction is complete but sustainable guiding principle application still needs to be verified.**

TVA has continued to apply the Sustainable Guiding Principles to its two largest office buildings; the Knoxville Office Complex (KOC) and the Chattanooga Office Complex (COC). Together these two buildings represent 21% of TVA goal subject buildings (as defined by EPAct05) using square footage accounting. Following current E.O. 13514 directives to exclude buildings that are 5,000 square feet or less, the COC and KOC would represent 25% of TVA square footage subject to this requirement.

In FY 2012 TVA applied the following Sustainable Guiding Principle requirements to the KOC:

- **Used integrated assessment, operation and management by using an integrated team to develop and implement policy regarding sustainable operations and maintenance.**
- **Used integrated assessment, operation and management by establishing operational performance goals for energy, water, material use and recycling, and indoor environmental quality, and ensure incorporation of these goals throughout the remaining lifecycle of the building.**
- **Reduced environmental impact of materials by using biobased content products.**

TVA also made a number of upgrades to further improve the energy efficiency of the KOC including replacing one of the cooling towers with a more efficient one, new chilled water pump, chiller VFD retrofit and new heating and cooling controls.

In FY 2012 TVA applied the following Sustainable Guiding Principle requirements to the COC:

- **Used integrated assessment, operation and management by using an integrated team to develop and implement policy regarding sustainable operations and maintenance.**
- **Used integrated assessment, operation and management by incorporating sustainable operations and maintenance practices within the appropriate Environmental Management System (EMS).**

- **Used integrated assessment, operation and management by establishing operational performance goals for energy, water, material use and recycling, and indoor environmental quality, and ensure incorporation of these goals throughout the remaining lifecycle of the building.**
- **Optimized energy performance by looking at the application of onsite renewable energy when lifecycle cost effective. A PV system considered for use on the COC was found to not be cost effective.**
- **Reduced environmental impact of materials by using biobased content products.**

In addition to the above work, TVA completed renovation of the Blue Ridge portion of the COC adding new ceilings, zoned occupancy sensors, dimmable daylighting controls, translucent baffles to eliminate direct beam sunlight and new energy efficient direct/indirect lighting. The combined daylighting, energy efficient lighting and lighting controls were monitored/measured and found to cut lighting energy use 75%.

To date, 52.3% of the Sustainable Guiding Principle requirements have been completed in the KOC and 71.6% have been completed in the COC. If TVA could receive partial credit for this work, it would be at 9.3% towards the 15% by FY 2015 requirement taking into account that these two buildings represent 25% of total building square footage subject to this E.O. directive.

In addition to work on its two largest office complexes, TVA continued work on multiple smaller buildings to incorporate the Sustainable Guiding Principles. Designs were completed on the following 31 buildings to incorporate Sustainable Guiding Principle requirements:

	Building	SF	Status
1	BST Big Sandy	6,697	Construction Complete
2	CBT Centerville Crew Quarters	5,428	Construction Complete
3	MFT Winchester Office PSC	6,277	Construction Complete
4	CVT Murphy Crew	6,644	Construction Complete
5	WPM Covington Line Crew	8,729	Construction Complete
6	HTA Scottsboro PSC	7,858	Construction Complete
7	BFN Livewell Security	14,412	SGPs Complete
8	NHJ Nickajack Admin	11,072	Construction Complete
9	MFT Murfreesboro CSC	14,012	Construction Complete
10	MFK Martin Crew Quarters	8,602	Construction Complete
11	JOT Johnson City CSC	24,554	SGPs Complete
12	NSC Montgomery 500 kV CQ	6,776	
13	MSL Multipurpose Building	58,752	SGPs Complete
14	SQN Livewell	14,154	
15	N Nor Baxter Building - Livewell	5,760	
16	GOT Garage	25,384	
17	TPM Corinth Crew Quarters	8,729	
18	GAF Livewell	13,050	
19	KIF Utility Building	14,240	
20	HDC Hartsville Admin 1	14,000	
21	MSL Muscle Shoals CSC	31,760	
22	GOT Greenway Transportation Garage	29,012	
23	BFN Common Maintenance Building	12,550	
24	MSL Office Service Warehouse Annex	22,549	

	Building	SF	Status
25	BLN Training	101,031	
26	CBT Columbia CSC	14,758	
27	CVT Cleveland CSC	15,443	
28	MSL TVA Airport Hanger	47,684	
29	KXT Volunteer 500 KV	18,663	
30	HDC Hartsville AWA/AWB	39,399	
31	WBF Office and Training Center	36,000	

Construction modifications were completed on 12 of the 31 buildings and all Sustainable Guiding Principle requirements were completed on 3 of the buildings (see table above)

TVA will continue to concentrate on applying the Sustainable Guiding Principles to the COC and KOC since this approach will have the greatest impact on reducing agency energy/water use and environmental impact as opposed to doing a greater number of smaller buildings. TVA is still requesting a means to allow partial credit for implementation of Sustainable Guiding Principle requirements in its two largest buildings. TVA plans to do additional design and construction in FY 2013 to implement the Sustainable Guiding Principles in its smaller buildings. This will not only help with quantity accounting through the FRPP but also demonstrate annual progress toward 100% conformance as directed in E.O. 13514.

TVA continues to incorporate sustainable design criteria into major renovation and new construction efforts. TVA reviews its building inventory in an effort to reduce inefficient, high cost, underutilized space. This consolidation effort provides an opportunity to further practice sustainable efforts such as:

- **Renovate space using removable, reusable wall systems**
- **Recycle and recondition office furniture and panel systems**
- **Install recyclable carpet tiles, low VOC finishes and biobased materials**
- **Upgrade lighting systems using T-5 and T-8 lamps including occupancy sensors**
- **Install personal work station occupancy sensors.**

All of these efforts are being done as part of an agency sustainable buildings program in TVA's Internal Energy Management Group.

TVA continues to buy materials that have positive environmental qualities and include those that meet RCRA, EPAct05, EISA 2007 and E.O. 13423/13514 objectives and other recycled content materials. Examples of environmental products purchased include recycled content paper, soy ink, rechargeable batteries, low mercury lamps, and non-toxic supplies, energy efficient motors, low standby power using appliances, ENERGY STAR® certified and EPEAT certified electronics and movable/reusable wall systems in place of drywall. TVA also purchases materials that meet sustainable architecture criteria. These non-toxic building materials have recycled content, and their creation, use, and disposal minimize environmental impacts.

The TVA EESC will be responsible for oversight of the implementation of all sustainable, energy and water requirements. All of these efforts are being done as part of an agency sustainable program

F. ENERGY EFFICIENCY/SUSTAINABLE DESIGN IN LEASE PROVISIONS:

Where applicable, TVA uses model lease provisions based on those recommended by the General Services Administration (GSA) and such provisions will be incorporated into new and renewed leases provided they are cost-effective. The model lease provisions address energy, sustainability, and water efficiency.

G. DISTRIBUTED GENERATION INCLUDING USE ON SITE RENEWABLE ENERGY RESOURCES AND COMBINED COOLING HEATING AND POWER SYSTEMS:

TVA is an electric utility; however, the use of distributed generation, where applicable, is used or considered for use.

IV. Data Tables and Inventories. Include the items listed below in the order given:

A. FY 2012 Annual Energy Management Data Report: A blank Data Report form and instructions for completing the form are included as Attachment 3 of the Guidance. Also include Data Reports for revisions to past years' energy data along with an explanation.

B. Excluded Facilities Inventory: should include the following information: building name, building location (city and state), and justification for excluded status under the criteria developed for EPACT '05:

Attachments:

1. **Attachment 1 - Annual Energy Management Data Report FY 2012(electronic file "TVA - Annual GHG Data Report v3-2 - Final - 01-18-13.xlsx")**
2. **Attachment 2 - Excluded Facility Inventory FY 2012 (electronic file "Attachment_2_Excluded_Facility_Inventory_1-31-13.xls")**
3. **Attachment 3 - Reporting Units and Conversion Factors for Federal Energy Management Reporting (electronic file "Attachment_3_Conversion_Factors_1-31-13.doc")**
4. **Attachment 4 - Fleet Strategy (electronic file "Attachment_4_ Fleet Strategy FY13 Nov 13 2012 TVA.pdf")**
5. **Attachment 5 - Annual Energy Management Data Report FY 2008 (electronic file "TVA-FEMP GHG Sustainability Data Report Version 1-6 - FY2008 - Final-New Baseline.xlsx"**

Attachment 2

TVA Excluded Facility Inventory - FY2012

Following is a list of TVA's excluded buildings which include generation, transmission and related energy intensive activities. Energy reduction in these buildings has become increasingly more difficult given that the majority of the energy consumption in these buildings is largely attributed to process energy (generation and transmission of electricity). In recognition of the above and the fact that only so much can be done to make these buildings more efficient in a cost effective manner, TVA, in discussion with DOE, has excluded these buildings.

Building Name	City	State
ALF ALLEN FOSSIL PLANT	Memphis	TN
APH APALACHIA HYDRO PLANT	Ducktown	NC
APU ROCKHOUSE, BUCKEYE, BAGWELL PUMP HOUSE	Decatur	AL
APU WHITESIDE PUMP HOUSE	Decatur	AL
BFN BROWNS FERRY NUCLEAR PLANT	Decatur	AL
BGK ADAIRVILLE 69 KV SWITCH HOUSE	Adairville	AL
BGK BOWLING GREEN MICROWAVE	Bowling Green	KY
BGK BRISTOW	Bowling Green	KY
BGK BRISTOW 161 KV SWITCH HOUSE	Bristow	AL
BGK BURKESVILLE 69 KV SWITCH HOUSE	Burkesville	AL
BGK CADIZ 161 KV SWITCH HOUSE	Cadiz	KY
BGK CANEYVILLE 69 KV SWITCH HOUSE	Caneyville	AL
BGK CASKY 161 KV SWITCH HOUSE	Hopkinsville	KY
BGK CELINA 69 KV SWITCH HOUSE	Celina	AL
BGK EAST BOWLING GREEN 161 KV SWITCH HOUSE	Bowling Green	AL
BGK ELKTON 69 KV SWITCH HOUSE	Elkton	KY
BGK FOUNTAIN RUN 69 KV SWITCH HOUSE	Fountain Run	AL
BGK FRANKLIN 161 KV SWITCH HOUSE	Franklin	KY
BGK GLASGOW 161 KV SWITCH HOUSE	Glasgow	AL
BGK HARTSVILLE NUC PLANT CONST 69 KV SWITCH H	Hartsville	AL
BGK HOLLIS CHAPEL MICROWAVE	Hollis Chapel	KY
BGK HOPKINSVILLE 161 KV SWITCH HOUSE	Hopkinsville	KY
BGK HOPSON 69 KV SWITCH HOUSE	Hopson	KY
BGK LAFAYETTE DISTRICT SWITCH HOUSES	Lafayette	AL
BGK LOGAN ALUMINUM 161 KV SWITCHOUSE	Russellville	KY
BGK MONTICELLO 69 KV SWITCH HOUSE	Monticello	AL
BGK ORLINDA 69 KV SWITCH HOUSE	Orlinda	AL
BGK PENCHEM 69 KV SWITCH HOUSE	Pencham	KY
BGK PORTLAND 161 KV SWITCH HOUSE	Portland	TN
BGK ROSINE 69 KV SWITCH HOUSE	Rosine	AL
BGK RUSSELLVILLE SWITCH HOUSES	Russellville	AL
BGK SCOTTSVILLE 161 KV SWITCH HOUSE	Scottsville	AL
BGK SOUTH BOWLING GREEN 161 KV SWITCH HOUSE	Bowling Green	AL
BGK SUMMER SHADE 161 KV SWITCH HOUSE	Summer Shade	KY
BGK TOMPKINSVILLE 69 KV SWITCH HOUSE	Tompkinsville	AL

Building Name	City	State
BGK WESTMORELAND 161 KV SWITCH HOUSE	Westmoreland	AL
BLN BELLEFONT NUCLEAR PLANT	Hollywood	AL
BOH BOONE HYDRO PLANT	Spurgeon	TN
BRF BULL RUN FOSSIL PLANT	Clinton	TN
BRH BLUE RIDGE HYDRO PLANT	Blue Ridge	GA
CBT BELFAST 161 KV PUMP HOUSE	Columbia	TN
CBT BELFAST 161 KV SWITCH HOUSE	Belfast	TN
CBT CENTERVILLE SWITCH HOUSE	Centerville	TN
CBT CLIFTON CITY 69 KV SWITCH HOUSE	Clifton City	TN
CBT COLLINWOOD 69 KV SWITCH HOUSE	Collinwood	TN
CBT COLUMBIA SWITCH HOUSES & PUMP HOUSE	Columbia	TN
CBT CORNERSVILLE 46 KV SWITCH HOUSE	Cornersville	TN
CBT CULLEOKA 46 KV SWITCH HOUSE	Culleoka	TN
CBT ELKTON 46 KV SWITCH HOUSE	Elkton	TN
CBT ETHRIDGE - VHF RADIO	Ethridge	TN
CBT HOHENWALD 161 KV SWITCH HOUSE	Hohenwald	TN
CBT JINGO 161 KV SWITCH HOUSE	Jingo	TN
CBT LAWRENCEBURG SWITCH HOUSES	Lawrenceburg	TN
CBT LEWISBURG SWITCH HOUSES	Lewsburg	TN
CBT LINDEN 69 KV SWITCH HOUSE	Linden	TN
CBT LORETTO 46 KV SWITCH HOUSE	Loretto	TN
CBT MAURY 500 KV SWITCH HOUSE	Maury	TN
CBT MONSANTO 161 KV SWITCH HOUSE	N/A	TN
CBT MONSANTO 46 KV SWITCH HOUSE	N/A	TN
CBT MOUNT PLEASANT SWITCH HOUSES	Mount Pleasant	TN
CBT NORTH COLUMBIA 46 KV SWITCH HOUSE	North Columbia	TN
CBT ONLY 161 KV SWITCH HOUSE	Only	TN
CBT PULASKI SWITCH HOUSES	Pulaski	TN
CBT SATURN 161 KV SWITCH HOUSE	Spring Hill	TN
CBT SPRING HILL MICROWAVE	Spring Hill	TN
CBT VICTOR SWITCH HOUSE	N/A	TN
CBT WAYNESBORO SWITCH HOUSES	Waynesboro	TN
CBT WEST COLUMBIA SWITCH HOUSES	Columbia	TN
CBT WILLIAMSPORT 46 KV SWITCH HOUSE	Williamsport	TN
CBT WRIGLEY 69 KV SWITCH HOUSE	Wrigley	TN
CCK GILBERTSVILLE SWITCH HOUSES	Gilbertsville	KY
CHC CAPACITORS AND OTHER	Chickmauga	TN
CHC CATOOSA 161 KV SWITCH HOUSE	Catoosa	TN
CHC CHATTANOOGA SWITCH HOUSES & MICROWAVE	Chattanooga	TN
CHC COALMONT SWITCH HOUSE & COMMUNICATION	Coalmont	TN
CHC COOPER HEIGHTS	Cooper Heights	TN
CHC DAYTON 161 KV SWITCH HOUSE	Dayton	TN
CHC DAYTON DISTRICT 69 KV SWITCH HOUSE	Dayton	TN
CHC HALETOWN 69 KV SWITCH HOUSE	Haletown	TN
CHC JASPER TELE	Jasper	TN
CHC LOOKOUT MOUNTAIN RADIO	Lookout Mountain	TN
CHC MOBILE & PORTABLE CAP. & GRD	Chattanooga	TN
CHC MONTLAKE MICROWAVE	Signal Mountain	TN
CHC OGLETHORPE 161 KV SWITCH HOUSE	Oglethorpe	GA
CHC RACCOON MTN MICROWAVE	Tiftonia	TN

Building Name	City	State
CHC SEQUOYAH TRAINING RADIO	Soddy Daisy	TN
CHC SIGNAL MOUNTAIN MICROWAVE	Signal Mountain	TN
CHC STEPHENSVILLE MICROWAVE	Stephensville	GA
CHC TAYLORS RIDGE	N/A	TN
CHC TILTON 115 KV	Tilton	TN
CHC TRENTON MICROWAVE	Trenton	TN
CHC VOLTAGE/CURRENT TRANSFORMERS	Chattanooga	TN
CHH CHICKAMAUGA HYDRO PLANT	Chattanooga	TN
COF COLBERT FOSSIL PLANT	Tuscumbia	AL
CTH CHATUGE HYDRO PLANT	Jefferson City	TN
CUF CUMBERLAND FOSSIL PLANT	Cumberland City	TN
CVT ANDERSON MICROWAVE	Anderson	TN
CVT APH 161 KV SWITCH HOUSE	Ducktown	NC
CVT ATHENS 161 KV SWITCH HOUSE	Athens	TN
CVT BENTON 69 KV SWITCH HOUSE	Benton	TN
CVT BLAIRSVILLE 69 KV SWITCH HOUSE	Blairsville	TN
CVT BLUE RIDGE HYDRO PLANT 69 KV SWITCH HOUSE	Blue Ridge	TN
CVT BOWATER 161 KV SWITCH HOUSE	N/A	TN
CVT BRAWLEY MTN MICROWAVE/RADIO	Brawley	TN
CVT BYRDSTOWN 69 KV SWITCH HOUSE	Byrdstown	TN
CVT CHARLESTON SWITCH HOUSES	Charleston	TN
CVT CHATUGE HYDRO PLANT 69 KV SWITCH HOUSE	N/A	TN
CVT COPPER BASIN 161 KV SWITCH HOUSE	Hayesville	NC
CVT COPPER BASIN COMM	Copper Basin	TN
CVT COTTONPORT RADIO	Cottonport	TN
CVT CRAB ORCHARD 69 KV SWITCH HOUSE	Crab Orchard	TN
CVT CROSSVILLE SWITCH HOUSE & RADIO	Crossville	TN
CVT DECATUR 69 KV SWITCH HOUSE	Decatur	TN
CVT DELANO 26 KV SWITCH HOUSE	Delano	TN
CVT EAST CLEVELAND SWITCH HOUSE & COMMUNICATION	Cleveland	TN
CVT EAVES BLUFF MICROWAVE/RADIO	Decatur	TN
CVT ELLIS MOUNTAIN MICROWAVE	N/A	TN
CVT ENGLEWOOD 69 KV SWITCH HOUSE	Englewood	TN
CVT EPWORTH 69 KV SWITCH HOUSE	Epworth	TN
CVT ETOWAH SWITCH HOUSE 69 KV SWITCH HOUSE	Etowah	TN
CVT FRIENDSVILLE 69 KV SWITCH HOUSE	Briendsville	TN
CVT GEORGETOWN 69 KV SWITCH HOUSE	Georgetown	TN
CVT GRANDVIEW RADIO/MICROWAVE	Grandview	TN
CVT GRIMSLEY 69 KV SWITCH HOUSE	Grimsley	TN
CVT HARRISON BAY 161 KV SWITCH HOUSE	N/A	TN
CVT HAYESVILLE 69 KV SWITCH HOUSE	Hayesville	TN
CVT HIWASSEE HYDRO PLANT 161 KV SWITCH HOUSE	N/A	TN
CVT HIWASSEE MICROWAVE	N/A	TN
CVT HOPEWELL 69 KV SWITCH HOUSE	Hopewell	TN
CVT JAMESTOWN 69 KV SWITCH HOUSE	Jamestown	TN
CVT JENA 69 KV SWITCH HOUSE	N/A	TN
CVT KIE 238 RADIO	N/A	TN
CVT LANG STREET 69 KV SWITCH HOUSE	N/A	TN
CVT LOUDON SWITCH HOUSES	Loudon	TN
CVT MADISONVILLE 69 KV SWITCH HOUSE	Madisonville	TN

Building Name	City	State
CVT MARBLE 69 KV SWITCH HOUSE	Marble	TN
CVT MAYLAND 69 KV SWITCH HOUSE	Mayland	TN
CVT MCDONALD 69 KV SWITCH HOUSE	McDonald	TN
CVT MONTEREY 161 KV SWITCH HOUSE	Monterey	TN
CVT MURPHY 161 KV SWITCH HOUSE	Murphy	NC
CVT NIOTA 69 KV SWITCH HOUSE	Niota	TN
CVT NOTTELY HYDRO PLANT 69 KV SWITCH HOUSE	Blairsville	GA
CVT OCOEE SWITCH HOUSES	Ocoee	TN
CVT OSWALD DOME MICROWAVE	Reliance	TN
CVT POND CREEK - FIBRE OPTIC	N/A	TN
CVT RICEVILLE 69 KV SWITCH HOUSE	Riceville	TN
CVT ROCKWOOD SWITCH HOUSES	Rockwood	TN
CVT ROOSEVELT MT MICROWAVE	Rosevelt Mt	TN
CVT SOUTH ATHENS 69 KV SWITCH HOUSE	Athens	TN
CVT SOUTH CLEVELAND 161 KV SWITCH HOUSE	Cleveland	TN
CVT SPRING CITY 161 KV SWITCH HOUSE	Spring City	TN
CVT SPRING CITY SWITCH HOUSES	Spring City	TN
CVT STALEY 161 KV SWITCH HOUSE	Staley	TN
CVT SWEETWATER SWITCH HOUSES	Sweetwater	TN
CVT TELLICO DISTRICT 69 KV SWITCH HOUSE	Tellico	TN
CVT TEN MILE 161 KV SWITCH HOUSE	Ten Mile	TN
CVT WAUCHECHA BALD RADIO	N/A	TN
CVT WHITE OAK MOUNTAIN RADIO	White Oak	TN
CVT WOOD GROVE 69 KV SWITCH HOUSE	Wood Grove	TN
DGH DOUGLAS HYDRO PLANT	Dandridge	TN
EST ANDERSON 46 KV SWITCH HOUSE	Anderson	TN
EST BLANCHE 46 KV SWITCH HOUSE	Blanche	TN
EST COWAN 46 KV SWITCH HOUSE	Cowan	TN
EST FAYETTEVILLE SWITCH HOUSES	Fayetteville	TN
EST FLINTVILLE 46 KV SWITCH HOUSE	Flintville	TN
EST HILLSBORO 46 KV SWITCH HOUSE	Hillsboro	TN
EST LYNCHBURG 46 KV SWITCH HOUSE	Lynchburg	TN
EST NORTH TULLAHOMA 161 KV SWITCH HOUSE	Tullahoma	TN
EST ORME MOUNTAIN MICROWAVE	N/A	TN
EST PARK CITY 46 KV SWITCH HOUSE	Park City	TN
EST PETERSBURG 46 KV SWITCH HOUSE	Petersburg	TN
EST SEWANEE SWITCH HOUSE & MICROWAVE	Sewanee	TN
EST SHERWOOD 46 KV SWITCH HOUSE	Sherwood	TN
EST WINCHESTER SWITCH HOUSES	Winchester	TN
ESTILL SPRINGS 46 KV SWITCH HOUSE	Estill Springs	TN
EZT WELLHOUSE (WATAUGA DAM)	Elizabethton	TN
FNH FONTANA HYDRO PLANT	Fontana Village	NC
FPH FORT PATRICK HENRY	Kingsport	TN
FTL FORT LOUDON HYDRO PLANT	Lenoir City	TN
GAF GALLATIN FOSSIL PLANT	Gallatin	TN
GEK CADIZ DISTRICT 69 KV SWITCH HOUSE	Cadiz	KY
GEK CERULEAN 69 KV SWITCH HOUSE	Cerulean	KY
GEK DUNMOR 69 KV SWITCH HOUSE	Dunmor	KY
GEK EDGOTEN 161 KV SWITCH HOUSE	Edgoton	KY
GEK ELKTON HILL RADIO/MICROWAVE	Elkton Hill	KY

Building Name	City	State
GEK GREENVILLE RADIO	Greenville	KY
GEK HOPKINSVILLE SWITCH HOUSE & MICROWAVE	Hopkinsville	KY
GEK KIRKMANSVILLE 69 KV SWITCH HOUSE	Kirkmansville	KY
GEK LYON 69 KV SWITCH HOUSE	Lyon	KY
GEK PARADISE FOSSIL PLANT 500 KV	Drakesboro	KY
GEK PEEDEE 69 KV SWITCH HOUSE	Peedee	KY
GEK PEMBROKE 69 KV SWITCH HOUSE	Pembroke	KY
GEK PRINCETON 161 KV SWITCH HOUSE	Princeton	KY
GFH GREAT FALLS HYDRO PLANT	Great Falls	TN
GUH GUNTERSVILLE HYDRO PLANT	Guntersville	AL
HDC HARTSVILLE N.P. 161KV SWITCH HOUSE	Hartsville	TN
HIH HIWASSEE HYDRO PLANT	Murphy	NC
HTA ADDISON 161 KV SWITCH HOUSE	Addison	AL
HTA ALBERTVILLE SWITCH HOUSES	Albertville	AL
HTA ALPHA 69 KV SWITCH HOUSE	Ft. Payne	AL
HTA ARAB SWITCH HOUSES & TELE	Arab	AL
HTA ARDMORE 161 KV SWITCH HOUSE	Ardmore	AL
HTA ASBURY RADIO	Asbury	AL
HTA ATHENS SWITCH HOUSES & TELE	Athens	AL
HTA BELLE MINA 46 KV SWITCH HOUSE	Belle Mina	AL
HTA BOAZ 46 KV SWITCH HOUSE	Boaz	AL
HTA BREMEN 46 KV SWITCH HOUSE	Bremen	AL
HTA BRINDLEY 46 KV SWITCH HOUSE	Brindley	AL
HTA BRYANT 161 KV SWITCH HOUSE	Bryant	AL
HTA COLLINSVILLE 161 KV SWITCH HOUSE	Collinsville	AL
HTA COURTLAND 46 KV SWITCH HOUSE	Courtland	AL
HTA CULLMAN SWITCH HOUSE & RADIO	Cullman	AL
HTA DANVILLE 46 KV SWITCH HOUSE	Danville	AL
HTA DECATUR 161 KV SWITCH HOUSE	Decatur	AL
HTA FABIUS MICROWAVE	Jackson Co.	AL
HTA FAIRVIEW 46 KV SWITCH HOUSE	Fairview	AL
HTA FALKVILLE 46 KV SWITCH HOUSE	Falkville	AL
HTA FARLEY SWITCH HOUSE & TELE	Farley	AL
HTA FINLEY 161 KV SWITCH HOUSE	Finley	AL
HTA FLINT 46 KV SWITCH HOUSE	Flint	AL
HTA FULTONDALE 115 KV SWITCH HOUSE	Fultondale	AL
HTA GERALDINE 46 KV SWITCH HOUSE	Geraldine	AL
HTA GOOSE POND 161 KV SWITCH HOUSE	Scottsboro	AL
HTA GROVE OAK 46 KV SWITCH HOUSE	Grove Oak	AL
HTA GUNTERSVILLE 161 KV SWITCH HOUSE	Guntersville	AL
HTA HANCEVILLE SWITCH HOUSES	Hanceville	AL
HTA HANEY 161 KV SWITCH HOUSE	Haney	AL
HTA HARTSELLE SWITCH HOUSES	Hartselle	AL
HTA HENEGAR 161 KV SWITCH HOUSE	Henegar	AL
HTA HOLLY POND 46 KV SWITCH HOUSE	Holly Pond	AL
HTA HUNTSVILLE 161 KV SWITCH HOUSE	Huntsville	AL
HTA HUNTSVILLE SWITCH HOUSES & MICROWAVES	Huntsville	AL
HTA JONES CHAPEL 46 KV SWITCH HOUSE	Jones Chapel	AL
HTA LAMBERT CHAPEL MICROWAVE	Jackson Co.	AL
HTA LIMESTONE 500 KV SWITCH HOUSE	Limestone	AL

Building Name	City	State
HTA MADISON 500 KV PUMP HOUSE	Madison	AL
HTA MONSANTO CHEMICAL 161 KV SWITCH HOUSE	Madison	AL
HTA MORGAN 46 KV SWITCH HOUSE	Morgan	AL
HTA MOULTON 161 KV SWITCH HOUSE	Moulton	AL
HTA MOULTON DISTRICT 46 KV SWITCH HOUSE	Moulton	AL
HTA MOUNT HOPE 46 KV SWITCH HOUSE	Mount Hope	AL
HTA MOUNT ROSZELL 46 KV SWITCH HOUSE	Mount Roszell	AL
HTA NANCE 161 KV SWITCH HOUSE	Courtland	AL
HTA PENCE 46 KV SWITCH HOUSE	Pence	AL
HTA POPLAR CREEK 46 KV SWITCH HOUSE	Poplar Creek	AL
HTA PRICEVILLE 161 KV SWITCH HOUSE	Priceville	AL
HTA PRICEVILLE 46 KV SWITCH HOUSE	Priceville	AL
HTA RED BAY 161 KV SWITCH HOUSE	Red Bay	AL
HTA REYNOLDS 161 KV SWITCH HOUSE	Lister Hill	AL
HTA SCOTTSBORO 161 KV SWITCH HOUSE	Scottsboro	AL
HTA SECTION 46 KV SWITCH HOUSE	Section	AL
HTA SHOALS 161 KV SWITCH HOUSE	Sheffield	AL
HTA SOUTH CULLMAN 46 KV SWITCH HOUSE	South Cullman	AL
HTA STEVENSON 161 KV SWITCH HOUSE	Stevenson	AL
HTA THORTON TOWN MICROWAVE	Rogersville	AL
HTA TOWN CREEK 46 KV SWITCH HOUSE	Town Creek	AL
HTA TRINITY 500 KV PUMP HOUSE	Trinity	AL
HTA TRINITY 500 KV SWITCH HOUSE	Decatur	AL
HTA TRINITY TELE	Trinity	AL
HTA UNION GROVE 46 KV SWITCH HOUSE	Union Grove	AL
HTA VALLEY CREEK 115 KV SWITCH HOUSE	Bessemer	AL
HTA WHEELER HYDRO PLANT 161 KV SWITCH HOUSE	Town Creek	AL
HTA WILSON MOUNTAIN RADIO	Muscle Shoals	AL
JCT FINGER	Finger	TN
JCT JACKSON 500 KV SWITCH HOUSE	Oakfield	TN
JCT LIGHTFOOT 69 KV SWITCH HOUSE	Lightfoot	TN
JCT NEW CASTLE MICROWAVE	New Castle	TN
JCT ROCK SPRINGS MICROWAVE	Rock Springs	TN
JCT SAVANNAH 161 KV SWITCH HOUSE	Savannah	TN
JCT SELMER 161KV SWITCH HOUSE	Selmer	TN
JCT SOUTH JACKSON	Jackson	TN
JCT TRACE PARK MICROWAVE	Trace Park	TN
JKT ADAMSVILLE 69 KV SWITCH HOUSE	Adamsville	TN
JKT ALAMO 161 KV SWITCH HOUSE	Alamo	TN
JKT BELLS 69 KV SWITCH HOUSE	Bells	TN
JKT BETHEL SPRINGS 69 KV SWITCH HOUSE	Bethel Springs	TN
JKT BOLIVAR SWITCH HOUSES	Bolivar	TN
JKT BROADVIEW MICROWAVE	Broadview	TN
JKT BROWNSVILLE 161 KV SWITCH HOUSE	Brownsville	TN
JKT CHESTERFIELD TELE	Chesterfield	TN
JKT DOUBLE BRIDGES 161 KV SWITCH HOUSE	N/A	TN
JKT DYERSBURG 161 KV SWITCH HOUSE	Dyersburg	TN
JKT HALLS 69 KV SWITCH HOUSE	Halls	TN
JKT HENDERSON 161 KV SWITCH HOUSE	Henderson	TN
JKT HUMBOLDT 161 KV SWITCH HOUSE	Humboldt	TN

Building Name	City	State
JKT JACKS CREEK 46 KV SWITCH HOUSE	Jacks Creek	TN
JKT JACKSON SWITCH HOUSE	Jackson	TN
JKT LEXINGTON 69 KV SWITCH HOUSE	Lexington	TN
JKT LUKA SWITCH HOUSE & MICROWAVE	Luka	TN
JKT MIDDALE 69 KV SWITCH HOUSE	Middale	TN
JKT MILAN SWITCH HOUSES	Milan	TN
JKT MILLEDGEVILLE 69 KV SWITCH HOUSE	Milledgeville	TN
JKT MONTGOMERY DISTRICT 69 KV SWITCH HOUSE	Montgomery	TN
JKT MORRIS 69 KV SWITCH HOUSE	Morris	TN
JKT MT. PETER	N/A	TN
JKT NATIONAL GUARD	N/A	TN
JKT NEWCASTLE MICROWAVE	Newcastle	TN
JKT NIXON 69 KV SWITCH HOUSE	Nixson	TN
JKT NORTON HILL MICROWAVE	Norton Hill	TN
JKT PARSONS 69 KV SWITCH HOUSE	Parsons	TN
JKT RAMER 161 KV SWITCH HOUSE	Ramer	TN
JKT RIPLEY 161 KV SWITCH HOUSE	Ripley	TN
JKT ROLLINS 46 KV SWITCH HOUSE	Rollins	TN
JKT SAULSBURY 46 KV SWITCH HOUSE	Saulsbury	TN
JKT SELMER SWITCH HOUSE & TELE	Selmer	TN
JKT SOUTH JACKSON SWITCH HOUSE & MICROWAVE	Jackson	TN
JKT TOONE 46 KV SWITCH HOUSE	Toone	TN
JKT TRENTON 69 KV SWITCH HOUSE	Trenton	TN
JKT TULU 69 KV SWITCH HOUSE	Tulu	TN
JKT WHITEVILLE 46 KV SWITCH HOUSE	Whiteville	TN
JOF JOHNSONVILLE FOSSIL PLANT	New Johnsonville	TN
JOT BANNER ELK 69 KV SWITCH HOUSE	Banner Elk	TN
JOT BEAN STATION 69 KV SWITCH HOUSE	Bean Station	TN
JOT BLUFF CITY PUMP & SWITCH HOUSE	Bluff City	TN
JOT BOONE HYDRO PLANT 161 KV	Surgeon	TN
JOT BULLS GAP 69 KV SWITCH HOUSE	Bulls Gap	TN
JOT BUNKER HILL - GEN	Bunker Hill	TN
JOT BUNKER HILL MICROWAVE	Rogersville	TN
JOT CHURCH HILL SWITCH HOUSE & MICROWAVE	Church Hill	TN
JOT COLONIAL HEIGHTS 69 KV SWITCH HOUSE	Colonial Heights	TN
JOT COSBY 161 KV SWITCH HOUSE	Cosby	TN
JOT CRANBERRY 161 KV SWITCH HOUSE	Cranberry	TN
JOT DANDRIDGE 69 KV SWITCH HOUSE	Dandridge	TN
JOT EAST NEWPORT 69 KV SWITCH HOUSE	Newport	TN
JOT ELIZABETHTON SWITCH HOUSES	Elizabethton	TN
JOT ELIZABETHTON SWITCH HOUSES & TELE	Elizabethton	TN
JOT ERWIN 69 KV SWITCH HOUSE	Erwin	TN
JOT FITTS GAP 69 KV SWITCH HOUSE	Fitts Gap	TN
JOT FPH 69 KV SWITCH HOUSE	Kingsport	TN
JOT GRAY 69 KV SWITCH HOUSE	Gray	TN
JOT GREENEVILLE IND PARK 161 KV SWITCH HOUSE	Greeneville	TN
JOT GREENLAND 69 KV SWITCH HOUSE	Greenland	TN
JOT HAMPTON 161 KV SWITCH HOUSE	Hampton	TN
JOT HOLSTON RADIOS	Carter County	TN
JOT JOHN SEVIER FOSSIL PLANT 161 KV SWITCH HO	Rogersville	TN

Building Name	City	State
JOT JOHNSON CITY SWITCH HOUSES	Johnson City	TN
JOT JONESBORO 69 KV SWITCH HOUSE	Jonesboro	TN
JOT JUG 69 KV SWITCH HOUSE	N/A	TN
JOT LOCUST SPRINGS 69 KV SWITCH HOUSE	Locust Springs	TN
JOT LOWLAND 69 KV SWITCH HOUSE	Lowland	TN
JOT MILLIGAN COLLEGE 69 KV SWITCH HOUSE	Milligan	TN
JOT MITCHELL 69 KV SWITCH HOUSE	Mitchell	TN
JOT MORRISTOWN SWITCH HOUSES & MICROWAVE	Morristown	TN
JOT MOUNTAIN CITY 69 KV SWITCH HOUSE	Mountain City	TN
JOT NEWLAND 69 KV SWITCH HOUSE	Newland	TN
JOT NEWPORT SWITCH HOUSES	Newport	TN
JOT NOLICHUCKY HYDRO PLANT 69 KV SWITCH HOUSE	N/A	TN
JOT NORTH BRISTOL 161 KV SWITCH HOUSE	Bristol	TN
JOT OAK GROVE 69 KV SWITCH HOUSE	Oak Grove	TN
JOT PANDORA 69 KV SWITCH HOUSE	Pandora	TN
JOT PINEY FLATS 69 KV SWITCH HOUSE	Piney Flats	TN
JOT POWER STORES - JCTY	N/A	TN
JOT ROGERSVILLE SWITCH HOUSE & MICROWAVE	Rogersville	TN
JOT RUTHTON 69 KV SWITCH HOUSE	Ruthton	TN
JOT RUTLEDGE 69 KV SWITCH HOUSE	Rutledge	TN
JOT SOUTH HOLSTON HYDRO PLANT 69 KV SWITCH HO	Bristol	TN
JOT SOUTHEAST JOHNSON CITY 69 KV SWITCH HOUSE	Johnson City	TN
JOT SULLIVAN 500 KV PUMP HOUSE	Piney Flats	TN
JOT SULLIVAN SWITCH HOUSE & COMMUNICATION	Sullivan	TN
JOT SURGIONSVILLE SWITCH HOUSES	Surgoinsville	TN
JOT TANGLEWOOD 69 KV SWITCH HOUSE	Tanglewood	TN
JOT TUSCULUM SWITCH HOUSE & TELE	Tusculum	TN
JOT WASHINGTON COLLEGE 69 KV SWITCH HOUSE	Jonesborough	TN
JOT WHITE PINE 161 KV SWITCH HOUSE	White Pine	TN
JOT WINNER 69 KV SWITCH HOUSE	Winner	TN
JSF JOHN SEVIER FOSSIL PLANT	Rogersville	TN
JTN ATOKA 161 KV SWITCH HOUSE	Atoka	TN
JTN CORDOVA 500 KV PUMP HOUSE	Cordova	TN
JTN COVINGTON COMM	Covington	TN
JTN DANCYVILLE 161 KV SWITCH HOUSE	Dancyville	TN
JTN FREEPORT 500 KV SWITCH HOUSE	Freeport	TN
JTN MASON 69 KV SWITCH HOUSE	Mason	TN
JTN MEMPHIS PUMP & SWITCH HOUSES & TELE	Memphis	TN
JTN MILLER SWITCH HOUSES	Miller	TN
KCT KEMPER CUMBUSTION TURBINE	Scooba	MS
KIF KINGSTON FOSSIL PLANT	Kingston	TN
KXT ALCOA TELE	Alcoa	TN
KXT ANDERSONVILLE SWITCH HOUSE & MICROWAVE	Andersonville	TN
KXT BLOCKHOUSE 69 KV SWITCH HOUSE	N/A	TN
KXT CARYVILLE 161 KV SWITCH HOUSE	Caryville	TN
KXT CHANDLER 161 KV SWITCH HOUSE	Chandler	TN
KXT CHEROKEE HYDRO PLANT 161 KV SWITCH HOUSE	Jefferson City	TN
KXT COMBS KNOB MICROWAVE	Combs Knob	TN
KXT DOUGLAS HYDRO PLANT 161 KV SWITCH HOUSE	Dandridge	TN
KXT DUNCAN 69 KV SWITCH HOUSE	Duncan	TN

Building Name	City	State
KXT FNH SWITCH HOUSE & RADIO	Fontana Village	NC
KXT FTL PLANT 161 KV SWITCH HOUSE	N/A	TN
KXT GREEN TOP MOUNTAIN MICROWAVE	N/A	TN
KXT HARRIMAN SWITCH HOUSES & MICROWAVE	Harriman	TN
KXT HUNTSVILLE 161 KV STORAGE	Huntsville	TN
KXT JEFFERSON CITY 69 KV SWITCH HOUSE	Jefferson City	TN
KXT KINGSTON SWITCH HOUSES	Kingston	TN
KXT KNOXVILLE SWITCH HOUSES & MICROWAVE	Knoxville	TN
KXT LAFOLLETTE SWITCH HOUSES & TELE	Lafollette	TN
KXT LENOIR CITY 69 KV SWITCH HOUSE	Lenoir City	TN
KXT LONSDALE COMM	Lonsdale	TN
KXT MARYVILLE 69 KV SWITCH HOUSE	Maryville	TN
KXT NORRIS HYDRO PLANT 161 KV SWITCH HOUSE	Norris	TN
KXT NORTH GATLINBURG 161 KV SWITCH HOUSE	Gatlinburg	TN
KXT ONEIDA 69 KV SWITCH HOUSE	Oneida	TN
KXT PIGEON FORGE 161 KV SWITCH HOUSE	Pigeon Forge	TN
KXT PINEVILLE 161 KV SWITCH HOUSE	Pineville	TN
KXT POWER STORES - KNOX	Knoxville	TN
KXT SEVIERVILLE 69 KV SWITCH HOUSE	Sevierville	TN
KXT SHOOKES GAP	Shooks Gap	TN
KXT SPEEDWELL 69 KV SWITCH HOUSE	Speedwell	TN
KXT SUNBRIGHT 69 KV SWITCH HOUSE	Sunbright	TN
KXT TWIN TOWERS MICROWAVE	N/A	TN
KXT WARTBURG 69 KV SWITCH HOUSE	Wartburg	TN
KXT WESTBOURNE 69 KV SWITCH HOUSE	Westbourne	TN
KXT WILDWOOD 69 KV SWITCH HOUSE	Wildwood	TN
KYH KENTUCKY HYDRO PLANT	Gilbertsville	KY
LCT BROWNSVILLE PLANT	Brownsville	TN
MFK BENTON 161 KV SWITCH HOUSE	Benton	KY
MFK BENTON CITY 69 KV SWITCH HOUSE	Benton	KY
MFK CALVERT 161 KV SWITCH HOUSE & TELE	Calvert City	KY
MFK CLINTON 161 KV SWITCH HOUSE	Clinton	KY
MFK COLDWATER 69 KV SWITCH HOUSE	Coldwater	KY
MFK EAST MURRAY 69 KV SWITCH HOUSE	Murry	KY
MFK FULTON 69 KV SWITCH HOUSE	Fulton	KY
MFK GRAND RIVER RADIO/MICROWAVE	Grand Rivers	KY
MFK HARDIN 69 KV SWITCH HOUSE	Hardin	KY
MFK HICKMAN 69 KV SWITCH HOUSE & MICRO	Hickman	KY
MFK HICKORY GROVE 69 KV SWITCH HOUSE	Hickory Grove	KY
MFK HORNBEAK RADIO/MICROWAVE	Hornbeak	KY
MFK LYNN GROVE MICROWAVE	Lynn Grove	KY
MFK MARSHALL 500 KV SWITCH HOUSE	Calvert City	KY
MFK MARTIN STEAM PLANT	Martin	KY
MFK MARTIN SWITCH HOUSE & RADIO	Martin	TN
MFK MAYFIELD SWITCH HOUSES & RADIO	Mayfield	KY
MFK MILBURN 69 KV SWITCH HOUSE	Milburn	KY
MFK MOSCOW 161 KV SWITCH HOUSE	Moscow	KY
MFK MURRAY SWITCH HOUSES & TELE	Murray	KY
MFK NATIONAL CARBIDE 161 KV SWITCH HOUSE	Calvert City	KY
MFK PADUCAH SWITCH HOUSE & TELE	Paducah	KY

Building Name	City	State
MFK PILOT OAK 69 KV SWITCH HOUSE	Pilot Oak	KY
MFK SHAWNEE REPEATER STATION	West Paducah	KY
MFK SOUTH CALVERT 161 KV SWITCH HOUSE	Calvert City	KY
MFK WEST MURRAY 69 KV SWITCH HOUSE	Murray	KY
MFT BEECH GROVE MICROWAVE	Beech Grove	TN
MFT EAST MCMINNVILLE 161 KV SWITCH HOUSE	McMinnville	TN
MFT EAST MURFREESBORO 161 KV SWITCH HOUSE	Murfreesboro	TN
MFT EAST SHELBYVILLE SWITCH HOUSES	Shelbyville	TN
MFT FRANKLIN 500 KV SWITCH HOUSE	Tullahoma	TN
MFT GREAT FALLS HYDRO PLANT 161 KV SWITCH HOU	Great Falls	TN
MFT LEBANON PUMP & SWITCH HOUSES	Lebanon	TN
MFT LIVINGSTON 161 KV SWITCH HOUSE	Livingston	TN
MFT MANCHESTER 161 KV SWITCH HOUSE	Manchester	TN
MFT MCMINNVILLE 161 KV SWITCH HOUSE	Mcminnville	TN
MFT MOBILE TRANSFORMER NO. 6 69 KV SWITCH HOU	N/A	TN
MFT MORRISON 161 KV SWITCH HOUSE	Morrison	TN
MFT MURFREESBORO SWITCH HOUSE & RADIO	Murfreesboro	TN
MFT RUSSELL HILL MICROWAVE	Russell Hill	TN
MFT SHELBYVILLE 46 KV SWITCH HOUSE	Shelbyville	TN
MFT SMITHVILLE SWITCH HOUSE & RADIO	Smithville	TN
MFT SMYRNA SWITCH HOUSE & TELE	Smyrna	TN
MFT SOUTH JACKSON 161 KV GENERATOR BLDG	Jackson	TN
MFT SPARTA SWITCH HOUSES	Sparta	TN
MFT TRIUNE 161 KV SWITCH HOUSE	Tuiune	TN
MFT TULLAHOMA 46 KV SWITCH HOUSE	Tullahoma	TN
MFT UNIONVILLE 46 KV SWITCH HOUSE	Unionville	TN
MFT WARTRACE 161 KV SWITCH HOUSE	Wartrace	TN
MFT WATERTOWN 161 KV SWITCH HOUSE	Watertown	TN
MFT WEST COOKEVILLE TELE	Cookeville	TN
MFT WILSON 500 KV SWITCH HOUSE	Mt. Juliet	TN
MFT WINCHESTER 161 KV SWITCH HOUSE	Winchester	TN
MFT WOODBURY 161 KV SWITCH HOUSE	Woodbury	TN
MHH MELTON HILL HYDRO PLANT	Oak Ridge	TN
NHD NOTTELY HYDRO PLANT	Blairsville	GA
NJH NICKAJACK HYDRO PLANT	So. Pittsburg	TN
NLC HYDRO PLANT	Greeneville	TN
NOH NORRIS HYDRO PLANT	Norris	TN
NSC ADAMS 69 KV SWITCH HOUSE	Adams	TN
NSC ASHLAND CITY 69 KV SWITCH HOUSE	Ashland City	TN
NSC BOGOTA 69 KV SWITCH HOUSE	Bogota	KY
NSC BRUCETON 69 KV SWITCH HOUSE	Bruceton	KY
NSC CAMDEN 161 KV SWITCH HOUSE	Camden	KY
NSC CENTRAL PIKE 161 KV SWITCH HOUSE	Central Pike	TN
NSC CHARLOTTE 69 KV SWITCH HOUSE	Charlotte	TN
NSC CLARKSVILLE SWITCH HOUSES & COMMUNICATION	Clarksville	TN
NSC CUMBERLAND CITY SWITCH HOUSES	Cumberland City	TN
NSC DAVIDSON 500 KV PUMP, SWITCH & TELE	Nashville	TN
NSC DICKSON SWITCH HOUSES & TELE	Dickson	TN
NSC DOVER 69 KV SWITCH HOUSE	Dover	TN
NSC DRESDEN 69 KV SWITCH HOUSE	Dresden	KY

Building Name	City	State
NSC ERIN 161 KV SWITCH HOUSE	Erin	TN
NSC FRANKLIN 161 KV SWITCH HOUSE	Franklin	TN
NSC GLEASON 69 KV SWITCH HOUSE	Gleason	KY
NSC GREEN BRIER 69 KV SWITCH HOUSE	Green Brier	TN
NSC GREENFIELD 69 KV SWITCH HOUSE	Greenfield	KY
NSC HENDERSONVILLE 161 KV SWITCH HOUSE	H'Ville	TN
NSC HUNTINGDON SWITCH HOUSES	Huntingdon	KY
NSC KENTON 69 KV SWITCH HOUSE	Kenton	KY
NSC KINGSTON SPRINGS 161 KV SWITCH HOUSE	Kingston	TN
NSC LONE OAK 69 KV SWITCH HOUSE	Loan Oak	TN
NSC MCKENZIE 69 KV SWITCH HOUSE	McKenzie	KY
NSC MODEL MICROWAVE	N/A	TN
NSC MONTGOMERY PUMP HOUSE & RADIO	Montgomery	TN
NSC NASHVILLE SWITCH HOUSES & MICROWAVES	Nashville	TN
NSC NEW PROVIDENCE 69 KV SWITCH HOUSE	New Providence	TN
NSC NEWBERN 161 KV SWITCH HOUSE	Newbern	KY
NSC ORLINDA	Orlinda	TN
NSC PARIS 161 KV SWITCH HOUSE	Paris	KY
NSC PIN HOOK 500 KV SWITCH HOUSE & COMM	Pin Hook	TN
NSC PLEASANT VIEW 69 KV SWITCH HOUSE	Pleasant View	TN
NSC POMONA 161 KV SWITCH HOUSE	Pomona	TN
NSC RIDGELY 69 KV SWITCH HOUSE	Ridgely	KY
NSC RUTHERFORD 161 KV SWITCH HOUSE	Rutherford	KY
NSC SHADY GROVE 69 KV SWITCH HOUSE	Shady Grove	TN
NSC SPRINGFIELD SWITCH HOUSES & COMM	Springfield	TN
NSC TREZEVANT 69 KV SWITCH HOUSE	Trezevant	KY
NSC TROY 69 KV SWITCH HOUSE	Troy	KY
NSC UNION CITY SWITCH HOUSE & MICROWAVE	Union City	KY
NSC VANLEER MICROWAVE	Vanleer	TN
NSC WEAKLEY SWITCH HOUSE & MICROWAVE	Weakley	KY
NSC WHITE BLUFF 69 KV SWITCH HOUSE	White Bluff	TN
NSC WHITE HOUSE 69 KV SWITCH HOUSE	N/A	TN
OC1 HYDRO PLANT	Parksville	TN
OC2 HYDRO PLANT	Copperhill	TN
OC3 HYDRO PLANT	Copperhill	TN
PAF PARADISE FOSSIL PLANT	Drakesboro	KY
PHM ACKERMAN 69 KV SWITCH HOUSE	Ackerman	MS
PHM HANDLE 46 KV SWITCH HOUSE	Handle	MS
PHM LOUISVILLE 161 KV SWITCH HOUSE	Louisville	MS
PHM MACON 161 KV SWITCH HOUSE	Macon	MS
PHM NOXAPATER 161 KV SWITCH HOUSE	Noxapater	MS
PHM PHILADELPHIA SWITCH HOUSE & MICROWAVES	Philadelphia	MS
PHM SEBASTOPOLE 161 KV SWITCH HOUSE	Sebastopole	MS
PHM STURGIS DISTRICT 69 KV SWITCH HOUSE	Sturgis	MS
PKH PICKWICK HYDRO PLANT	Luka	TN
RAC ALTAMONT 69 KV SWITCH HOUSE	Altamont	TN
RAC COALMONT 161 KV SWITCH HOUSE	Coalmont	TN
RAC DUNLAP 69 KV SWITCH HOUSE	Dunlap	TN
RAC JASPER 161 KV SWITCH HOUSE	Jasper	TN
RAC KIMBALL 161 KV SWITCH HOUSE	Kimball	TN

Building Name	City	State
RAC MONTEAGLE 69 KV SWITCH HOUSE	Monteagle	TN
RAC NICKAJACK HYDRO PLANT 161 KV SWITCH HOUSE	South Pittsburg	TN
RAC PALMER 69 KV SWITCH HOUSE	Palmer	TN
RAC PIKEVILLE 161 KV SWITCH HOUSE	Pikeville	TN
RAC RACCOON MOUNTAIN PUMPED STORAGE PLANT	Tiftonia	TN
SHF SHAWNEE FOSSIL PLANT	West Paducah	KY
SHH SOUTH HOLSTON HYDRO PLANT	Bristol	TN
SQN SEQUOYAH NUCLEAR PLANT	Soddy Daisy	TN
TFH TIMS FORD HYDRO PLANT	Winchester	TN
TPM AMORY SWITCH HOUSES	Amory	MS
TPM ASHLAND 46 KV SWITCH HOUSE	Ashland	MS
TPM BALDWYN 161 KV SWITCH HOUSE	Baldwyn	MS
TPM BATESVILLE 161 KV SWITCH HOUSE	Batesville	MS
TPM BELDEN 46 KV SWITCH HOUSE	Belden	MS
TPM BELMONT 46 KV SWITCH HOUSE	Belmont	MS
TPM BLUE MOUNTAIN 46 KV SWITCH HOUSE	Blue Mountain	MS
TPM BOONEVILLE SWITCH HOUSES	Booneville	MS
TPM BRUCE SWITCH HOUSES & MICROWAVE	Bruce	MS
TPM BURNSVILLE 161 KV SWITCH HOUSE	Burnsville	MS
TPM CHARLESTON 26 KV SWITCH HOUSE	Charleston	MS
TPM COFFEEVILLE 161 KV SWITCH HOUSE	Coffeeville	MS
TPM CORINTH SWITCH HOUSES	Corinth	MS
TPM CORNERSVILLE 46 KV SWITCH HOUSE	Ecru	MS
TPM ENTERPRISE 46 KV SWITCH HOUSE	Enterprise	MS
TPM FULTON SWITCH HOUSES	Fulton	MS
TPM GRAHAM - KIE 255	Graham	MS
TPM GRAHAM MICROWAVE	Union County	MS
TPM GUNTOWN 161 KV SWITCH HOUSE	Guntown	MS
TPM HICKORY FLAT 46 KV SWITCH HOUSE	Hickory Flat	MS
TPM HOLLY SPRINGS SWITCH HOUSE, MICRO. & TELE	Holly Springs	MS
TPM KIRKVILLE 46 KV SWITCH HOUSE	Kirkville	MS
TPM LAMAR ENG GEN	Lamar	MS
TPM LAMAR KIE 241	Lamar	MS
TPM NASA 161 KV SWITCH HOUSE	Iuka	MS
TPM NEW ALBANY SWITCH HOUSE & TELE	New Albany	MS
TPM NORTH SARDIS 161 KV SWITCH HOUSE	Sardis	MS
TPM NORTHEAST CORINTH 161 KV SWITCH HOUSE	Corinth	MS
TPM NORTHWEST TUPELO 46 KV SWITCH HOUSE	Tupelo	MS
TPM OKOLONA SWITCH HOUSES	Okolona	MS
TPM OXFORD 161 KV SWITCH HOUSE & TELE	Oxford	MS
TPM PONTOTOC 161 KV SWITCH HOUSE	Pontotoc	MS
TPM RIENZI 46 SWITCH HOUSE	Rienzi	MS
TPM RIPLEY 161 KV SWITCH HOUSE	Ripley	MS
TPM SARDIS 161 KV SWITCH HOUSE	Sardis	MS
TPM SHANNON 46 KV SWITCH HOUSE	Shannon	MS
TPM TERRAPIN MTN RADIO	Sardis	MS
TPM TISHOMINGO 46 KV SWITCH HOUSE	Tishomingo	MS
TPM TUPELO SWITCH HOUSES & COMMUNICATION	Tupelo	MS
TPM UNION SWITCH HOUSE & COMM	Union	MS
TPM WALNUT 46 KV SWITCH HOUSE	Walnut	MS

Building Name	City	State
TPM WATER VALLEY 161 KV SWITCH HOUSE	Water Valley	MS
TPM WOODALL MOUNTAIN MICROWAVE	Iuka	MS
TPM YELLOW CREEK NP CONST 161 KV SWITCH HOUSE	N/A	MS
WAH WATAUGA HYDRO PLANT	Elizabethton	TN
WBF WATTS BAR FOSSIL PLANT	Spring City	TN
WBH WATTS BAR HYDRO PLANT	Spring City	TN
WBN WATTS BAR NUCLEAR PLANT	Spring City	TN
WCF WIDOWS CREEK FOSSIL PLANT	Bridgeport	AL
WEH WHEELER HYDRO PLANT	Town Creek	TN
WIH WILBUR HYDRO PLANT	Leighton	AL
WLH ABERDEEN SWITCH HOUSES & MICROWAVES	Aberdeen	MS
WLH CHEMICAL PLANT PS 46 KV SWITCH HOUSE	Lexington	AL
WLH LEIGHTON SWITCH HOUSES & RADIO	Leighton	AL
WLH TUSCUMBIA SWITCH HOUSES	Tuscumbia	AL
WLH WILSON HYDRO PLANT	Muscle Shoals	AL
WPM ARTESIA 46 KV SWITCH HOUSE	Bonicord	MS
WPM BOLIVAR	Caledonia	MS
WPM BONICORD	Bonicord	MS
WPM CALEDONIA 46 KV SWITCH HOUSE	Caledonia	MS
WPM CALHOUN CITY 161 KV SWITCH HOUSE	Covington	MS
WPM COLUMBUS AIR FORCE BASE 46 KV SWITCH HOUS	Clarksburg	MS
WPM COLUMBUS DISTRICT 46 KV SWITCH HOUSE	Columbus	MS
WPM COLUMBUS SWITCH HOUSES & MICROWAVES	Columbus	MS
WPM COUNCE 161 KV SWITCH HOUSE	Counce	TN
WPM DEKALB 161 KV SWITCH HOUSE	Dekalb	MS
WPM EAST COLUMBUS 161 KV SWITCH HOUSE	Columbus	MS
WPM EUPORA 161 KV SWITCH HOUSE	Eupora	MS
WPM HANDLE 161 KV SWITCH HOUSE	Handle	TN
WPM HICKORY VALLEY 161KV SWITCH HOUSE	Hickory Valley	MS
WPM HINZE RADIO/MICROWAVE	Louisville	MS
WPM HOOKER 46 KV SWITCH HOUSE	Hooker	MS
WPM HOUSTON 161 KV SWITCH HOUSE	HoustOn	MS
WPM LEAKE 161 KV SWITCH HOUSE	Carthage	MS
WPM LENA RADIO/MICROWAVE	Lena	MS
WPM LOUISVILLE 161 KV SWITCH HOUSE	Louisville	MS
WPM LOWNDES 500 KV SWITCH HOUSE	Lowndes	MS
WPM LUDLOW 46 KV SWITCH HOUSE	Ludlow	MS
WPM MABEN 46 KV SWITCH HOUSE	Maben	MS
WPM MIDWAY 161 KV SWITCH HOUSE	Louisville	MS
WPM MONROE COUNTY 46 KV SWITCH HOUSE	Monroe	MS
WPM OLIVE BRANCH 161 KV SWITCH HOUSE	Olive Branch	MS
WPM PHILADELPHIA	Philadelphia	MS
WPM PRAIRIE 46 KV SWITCH HOUSE	Prairie	MS
WPM SAND HILL MICROWAVE	Sand Hill	MS
WPM SCOTT 115 KV SWITCH HOUSE	Ludlow	MS
WPM STARKVILLE SWITCH HOUSES	Starkville	MS
WPM WESTPOINT SWITCH HOUSES & MICROWAVES	Westpoint	MS

ATTACHMENT 3

REPORTING UNITS AND CONVERSION FACTORS FOR FEDERAL ENERGY MANAGEMENT REPORTING

Standard Buildings/Facilities
Industrial, Laboratory, and Other Energy-Intensive Facilities
Exempt Facilities

Fuel Type	*Reporting Units*	*BTUs per Reporting Unit*	*Joules per Reporting Unit*	*GigaJoules (GJ) per Reporting Unit*
Electricity	Megawatt Hour (MWH)	3,412,000	3,599,660,000	3.59966
Fuel Oil	1,000 Gallons	138,700,000	146,328,500,000	146.3285
Natural Gas	1,000 Cubic Feet	1,031,000	1,087,705,000	1.087705
LPG/Propane	1,000 Gallons	95,500,000	100,752,500,000	100.7525
Coal	Short Ton	24,580,000	25,931,900,000	25.9319
Purchased Steam	Billion Btu (BBtu)	1,000,000,000	1,055,000,000,000	1,055.00
Other	Billion Btu (BBtu)	1,000,000,000	1,055,000,000,000	1,055.00

Vehicles/Equipment

Fuel Type	*Reporting Units*	*BTUs per Reporting Unit*	*Joules per Reporting Unit*	*GigaJoules (GJ) per Reporting Unit*
Auto Gas	1,000 Gallons	125,000,000	131,875,000,000	131.875
Diesel	1,000 Gallons	138,700,000	146,328,500,000	146.3285
LPG/Propane	1,000 Gallons	95,500,000	100,752,500,000	100.7525
Aviation Gas	1,000 Gallons	125,000,000	131,875,000,000	131.875
Jet Fuel	1,000 Gallons	130,000,000	137,150,000,000	137.150
Navy Special	1,000 Gallons	138,700,000	146,328,500,000	146.3285
Other	Billion Btu (BBtu)	1,000,000,000	1,055,000,000,000	1,055.00

Other Conversion Factors

100 Cubic Feet (Ccf) = 748 Gallons
1 Acre-Foot = 325,851 Gallons
1 Liter = 0.264 Gallons
1 Cubic Meter = 264 Gallons
1 ton-hour of refrigeration = 12,000 Btu

Tennessee Valley Authority
Fleet Management Strategy

Original: October 4, 2002
Revised: November 4, 2004
Revised: November 30, 2005
Revised: December 13, 2006
Revised: December 20, 2007
Revised December 30, 2008
Revised December 07, 2009
Revised December 3, 1010
Revised December 1, 2011
Revised November 9, 2012

Tennessee Valley Authority Fleet Management Strategy

Executive Summary

The Tennessee Valley Authority, a corporation owned by the U.S. government, provides electricity for business customers and distribution utilities that serve 9 million people in parts of seven southeastern states at prices below the national average. TVA, which receives no taxpayer money and makes no profits, also provides flood control, navigation and land management for the Tennessee River system and assists utilities and state and local governments with economic development.

TVA has a long history of demonstrating stewardship toward energy reduction and fuel efficiency and will continue to work toward meeting fuel reduction and vehicle efficiency. TVA intends to comply with applicable statutes and, in accord with its mission, all applicable Executive Orders.

TVA will continue to use alternative fueled vehicles (AFVs), including electric vehicles, whenever possible. TVA recognizes the value of hybrid electric vehicle technology in reducing fuel consumption, increasing versatility and promoting electric propulsion.

TVA Fleet Management is responsible for managing light and medium duty assigned sedans, vans, SUVs, and trucks needed to carry out the agency's mission.

I-1. TVA Fleet Characteristics and AFVs

TVA vehicles are spread across its seven-state service area. The TVA service area covers all of Tennessee and portions of six other states; therefore, employees are widely dispersed and often travel significant distances to perform maintenance and system upgrades at remote sites, repair storm damage, and attend training classes, meetings and presentations.

TVA vehicles are used primarily outside of metropolitan statistical areas as described in EPAct92/05. Also, significantly for purposes of EPAct92/05, alternative fueled vehicle requirements, TVA has no central fueling facilities in metropolitan statistical areas. Further, as coordinated with DOE and OMB, TVA medium and heavy duty vehicles used in maintaining the reliable operation of the power system are within the intent of exemptions in EPAct92/05, such as emergency or off-road vehicles. Based on these facts, EPAct92/05 has significant application only to TVA's purchase of light duty fleet vehicles.

TVA intends to continue to add to its current fleet of AFVs. Annual fleet characteristics for light duty vehicles will be reported in FAST as well as the "TVA Energy Management Annual Report".

To increase AFV use, Fleet Management:

- Plans to purchase and introduce electric vehicles into its fleet where feasible and appropriate. Because TVA facilities are geographically dispersed, a current obstacle to electric vehicle use includes the extended trip radius that most TVA employees travel.
- Plans to focus on replacing older vehicles with AFVs. These vehicles will be strategically placed in areas around the Tennessee Valley where E85 fueling stations are available. In areas that E85 is not easily accessible, Fleet Management will place low GHG emissions vehicles or hybrid vehicles in those areas.
- Plans to purchase additional hybrid electric vehicles including where cost effective plug-in hybrid electric vehicles and incorporate them into its fleet where feasible and appropriate. Because TVA facilities are geographically dispersed, a current obstacle to effective

hybrid/plug-in hybrid electric vehicle use is the extended highway mileage that most TVA employees travel to get to remote sites. Since the benefits of driving hybrid electric/plug-in hybrid electric vehicles are realized in urban settings, TVA will identify employees whose driving fit this pattern.

I-2. TVA Fleet Strategy to Reduce Fuel Use and Increase Efficiency

Annual petroleum use for vehicles covered under E.O. 13423 and E.O. 13514 will continue to be reported in FAST as well as the "TVA Energy Management Annual Report."

To reduce fuel use and increase efficiency, Fleet Management:

- Plans to annually review and revise its specifications for light duty vehicles (including the vehicle equipment) to improve standardized vehicle specifications for each function that carries out TVA's mission. The intent is to purchase the most economically efficient and fuel efficient vehicle that will still achieve the requirements for the vehicle's intended function and carry out the mission of Fleet Management. All future replacement vehicles must be procured in accordance with the revised specifications.
- Plans to operate and expand a shared vehicle program in metropolitan areas where employees can check-out non-work vehicles for occasional or infrequent travel. This is in contrast to an employee having an assigned vehicle that is only infrequently or occasionally used. The intent is to have greater use of fewer vehicles and to encourage pooling. In the previous year, Fleet Management implemented the WeCar program from Enterprise Rent-A-Car at four TVA locations. The program has been extensively promoted and future expansion to other metropolitan areas is anticipated in the upcoming year.
- Plans to purchase additional AFVs as detailed in I-1 TVA Fleet Characteristics and AFVs. During the current reporting period, Fleet Management has added AFVs as detailed in I-1 to its inventory.
- Plans to continue to use various transportation options to increase efficiency, including use of personal vehicles, short term rental cars and assigned vehicles. The optimal method of transportation is determined by trip duration and miles driven.
- Plans to analyze under-used or high-cost assigned vehicles in TVA's fleet to achieve optimal balance between WeCar rentals and TVA assigned vehicles. The strategy will help manage rightsizing the fleet as well as reduce petroleum consumption and increase efficiency.
- Plans to establish assigned vehicle eligibility criteria to optimize fleet size and ensure all assigned vehicles are properly suited to perform the requirements of their intended function. This, in conjunction with standardized vehicle specifications, will serve as guidance to achieving the most efficient fleet. Less-used vehicles and vehicles not meeting the requirements of the Fleet Management mission will be considered for elimination. For sedans, Fleet Management plans to develop business justification criteria and evaluate the fleet for new vehicle assignments or retaining sedans currently in operation.
- Plans to evaluate the GSA vehicle leasing program to determine if leasing vehicles from GSA can be incorporated into the Fleet Management strategy.
- Plans to educate employees on the benefits of making more efficient use of TVA's vehicle fleet and where possible promoting the option of video/teleconferencing meetings, presentations and training as opposed to travel.

Tennessee Valley Authority
GHG Inventory Qualitative Statement
FY 2012

1-31-13
Dr. Joseph J. Hoagland, TVA Senior Sustainability Officer (SSO)
John Myers, Director Environmental Policy & Regulatory Affairs (jwmyers@tva.gov)
David R. Zimmerman, Manager, Sustainable Design (drzimmerman@tva.gov)
Including the TVA Internal Energy Management Program (IEMP)

The Tennessee Valley Authority (TVA) is pleased to submit its FY 2012 Greenhouse Gas (GHG) Inventory. The point of contact for the TVA GHG Inventory is David Zimmerman (423/751-8165).

For the reporting period FY 2008, TVA had a total of 11,584 employees and estimated 10,691 on-site contractors. For the reporting period FY 2012, TVA had a total of 12,696 employees and estimated 14,843 on-site contractors. For the reporting period FY 2008, TVA had a total of 9,066,000 square feet for goal-subject (GS) and 19,100,800 square feet for the goal-excluded (GE) buildings. For the reporting period FY 2012, TVA had a total of 9,799,300 square feet for goal-subject (GS) and 20,183,900 square feet for the goal-excluded (GE) buildings.

The inventory was developed in accordance with the *Federal GHG Accounting and Reporting Guidance (Guidance).* TVA's power system was specifically excluded from EO 13514 (TVA's power system GHG emissions were reported to the EPA and was 105,997,550 MT CO_2e for FY 2008 and 75,356,288 MT CO_2e for FY 2012).

The GHG inventory includes Scope 1, 2 and 3 emissions for all of TVA, calculated in accordance with the *Guidance* and the *Federal GHG Accounting and Reporting Guidance Technical Support Document (TSD)*. All calculations were based on the FEMP GHG Sustainability Data Report Version 3-2 and any exception noted on the FEMP spreadsheets. Data was collected throughout TVA utilizing established databases. Uncertainty in data quality is footnoted in the reporting spreadsheets.

Scope 1 & 2 target FY 2012 emissions have been reduced 11.49% over the FY 2008 baseline inventory. It should be noted that TVA'S FY 2008 baseline was updated this year to account for the addition of TVA's light duty vehicles.

Scope 3 target FY 2012 emissions have increased by 1.57% over the 2008 baseline inventory. TVA re-evaluated and updated methodology used to account for employee commuting data to make it more accurate which resulted in greater than expected vehicle miles driven. TVA is prioritizing improvements and updates in its reporting systems for Scope 3 GHG accounting which should help us show reductions for next January's reporting

Looking at GHG emission totals, overall, TVA reduced target subject emissions 5.50% from FY 2008 to FY 2012 taking into account the revised FY 2008 baseline.

As recommended by the *Federal Reporting Guidance*, TVA maintains an Inventory Management Plan (IMP) which describes the steps taken to develop its inventory, document the processes used to collect the inventory, including points of contact.

Appendix S:
TVA-FEMP GHG Sustainability Data Report FY2008

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Available here:

APPENDIX S TVA-FEMP GHG Sustainability Data Report FY2008 .xlsx

Appendix T:
TVA Annual GHG Sustainability Data Report FY2012

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Available here:

APPENDIX T TVA Annual GHG Sustainability Data Report FY2012.xlsx

Tennessee Valley Authority

Inventory Management Plan
for the Comprehensive Greenhouse Gas Reporting Plan

Executive Order 13514

Federal Leadership in Environmental, Energy, and Economic Performance

Prepared by:

January 24, 2013

Inventory Management Plan Revision History

Revision Number	Approved / Revised / Reviewed By	Approval / Revision / Review Date	Description (Initial Approval, Revision, or Review along with further details of revision if needed)
00	Paul Hurt	1-20-2011	Initial Approval
01	Karen Utt	1-30-2012	Revision
02	Karen Utt	1-24-2013	Revision

Table of Contents

List of Acronyms

CEQ	Council on Environmental Quality
CGIM	Comprehensive GHG Inventory Manager
CHP	Combined Heat and Power
eGRID	Emissions & Generation Resource Integrated Database
EO	Executive Order
EPA	Environmental Protection Agency
F-gas	Fluorinated Gas (HFCs, PFCs, SF6)
FAST	Federal Automotive Statistical Tool
FEMP	Federal Energy Management Program
FY	Fiscal Year
GE	Goal-Excluded
GHG	Greenhouse Gas
GS	Goal-Subject
GSA	General Services Administration
IMP	Inventory Management Plan
LIM	Logistics Management Institute
MRR	EPA's GHG Mandatory Reporting Rule
MSW	Municipal Solid Waste
OFEE	Office of the Federal Environmental Executive
OMB	Office of Management and Budget
PNR	Passenger Name Record
POC	Point-of-Contact
PSP	Public Sector Protocol
REC	Renewable Energy Certificate
T&D	Transmission and Distribution
TSD	Technical Support Document for Federal GHG Accounting and Reporting Guidance
SSO	Senior Sustainability Officer
SSPP	Strategic Sustainability Performance Plan
VE	Vehicles and Equipment
WRI	World Resources Institute
WTE	Waste-to-Energy
WWTP	Wastewater Treatment Plant

1.0 Introduction

The purpose of this document is to specify methods and procedures used to verify and validate TVA's Comprehensive Greenhouse Gas (GHG) Emission Inventory in response to Section 2(c) of Executive Order (EO) 13514. As a corporation owned by the U.S. government, TVA strives to transparently balance the *Federal GHG Accounting and Reporting Guidance* with commonly accepted greenhouse gas accounting and reporting practices currently in use within the U.S. electric utility industry.

On October 5, 2009, President Obama signed EO 13514 requiring Federal agencies to conduct annual GHG inventories of their operations and set reduction goals, in addition to tracking and reducing water, energy, and petroleum use. The GHG inventory reporting requirements contained within the *Federal GHG Accounting and Reporting Guidance* were designed according to the framework in the *WRI/LMI Greenhouse Gas Protocol for the U.S. Public Sector (PSP).*

According to EO 13514, each Federal agency is required to annually report its comprehensive GHG emission inventory and set reduction targets; expressed as a reduction in absolute emissions by 2020 compared to the agency's estimated emissions from 2008. All Federal agencies have created separate targets for each scope.

TVA strives to continuously improve its GHG accounting and reporting practices. Verification is an objective independent assessment of the accuracy and completeness of reported GHG information and its conformance to pre-established GHG accounting and reporting principles. The verification and validation of TVA inventory data is accomplished by auditing to the *Federal GHG Accounting and Reporting Guidance (Federal Reporting Guidance)* provided through the Council on Environmental Quality (CEQ) in accordance with Section 6 of the *Federal Reporting Guidance.*

While the *Federal Accounting and Reporting Guidance* is intended to be a stand-alone document that details procedures for Federal agencies to comply with Subsection 2(c), EO 13514, it follows the basic guidelines found in the *PSP Sector* and defers to generally accepted GHG accounting practices. TVA has an interest maintaining consistent, accurate and credible internal and external GHG accounting and reporting--regardless of where its GHG inventory data is publicly reported.

As required by the *Federal Reporting Guidance*, TVA submits a qualitative statement and maintains an Inventory Management Plan (IMP) which describes the steps taken to develop its inventory, document the processes used to collect the inventory, including points of contact.

TVA also has two additional verification options it may consider:

1. ***Second-Party Verification:*** Verification by another TVA organization in*dependent of the organization* res***ponsible for preparation o***f the inventory.
2. ***Third-Party Verification***: Verification by an external entity independent of the TVA organization responsible for preparation of the inventory.

The *Federal Reporting Guidance* indicates TVA's IMP should follow the general approach outlined in *The GHG Protocol for the U.S. Public Sector: Interpreting the Corporate Standard for U.S. Public Sector (Public Sector Protocol or PSP)* jointly published the World Resources

Institute (WRI) and the Logistics Management Institute (LMI), or when silent, *The Climate Registry General Verification Protocols and Electric Power Sector Verification Protocols.*

The Federal Energy Management Program (FEMP) will also review the data submitted by TVA, and may also follow up with TVA as appropriate to clarify any questions regarding data quality. However, the data review by FEMP is not a substitute for verification and validation of the Comprehensive GHG Inventory by TVA.

The information and procedures presented in this *IMP* are based on the June 4, 2012 version of the *Federal Reporting Guidance;* the October 6, 2010 version of the *Federal Greenhouse Gas Accounting and Reporting Guidance, Technical Support Document (TSD);* and the October 13, 2010 version of the *Public Sector Protocol.* This *IMP* may be reviewed and updated periodically if the *Federal Reporting Guidance* is revised or if WRI and LMI revise the *Public Sector Protocol.*

2.0 Guiding GHG Accounting and Reporting Principles

Greenhouse gas accounting and reporting principles are intended to ensure that the information represents a faithful, true, and fair account of an organization's GHG emissions. In general, the *PSP* states that GHG accounting and reporting should be based on the five following principles:

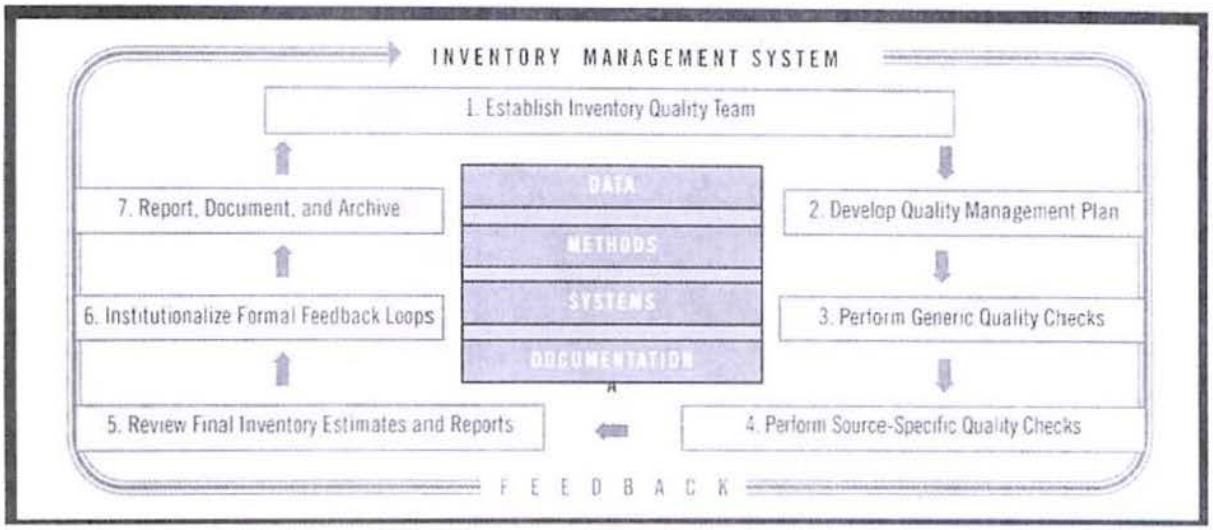
- ***Relevance***: Ensure the GHG inventory appropriately reflects the GHG emissions of the organization and serves the decision-making needs of users—both internal and external to the organization.
- ***Completeness***: Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusion.
- ***Consistency***: Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.
- ***Transparency***: Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
- ***Accuracy***: Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.

TVA's GHG inventory quality management system utilizes the practical framework contained in the *PSP* to help the Agency conceptualize and design its quality management system and to help plan for future improvements. The framework focuses on the following institutional, managerial, and technical components of its inventory:

- Methods
- Data
- Inventory Processes and Systems
- Documentation

This framework is presented in Figure 1.

Figure 1. Public Protocol Inventory Quality Management System[1]



Source: WRI/LMI The Greenhouse Gas Protocol for the U.S. Public Sector

3.0 Inventory Methods (Calculation of Emissions)

These are the technical aspects of inventory preparation and can include the following activities:

- Defining inventory boundaries and treatment of joint ventures and identify sources, etc.
- Identification of methods for estimating emissions
- Establishing procedures for applying and updating inventory methods in response to new organization activities, new technical information, or new reporting requirements

The *TVA Comprehensive GHG Accounting and Reporting Plan* selects the methods for estimating emissions that accurately represent the characteristics of their source categories. The design of *TVA's GHG Comprehensive Accounting and Reporting Plan* provides for the selection, application, and updating of inventory methods as new research becomes available, changes are made to organizational operations, or the importance of inventory reporting is elevated.

Annual Federal Agency EO 13514 greenhouse gas inventories must be submitted through the *GHG Reporting Portal*. The calculation methodologies required and implemented are those provided in the *Federal GHG Accounting and Reporting Guidance Technical Support Document (TSD)* published by the CEQ. The *GHG Reporting Portal* will accurately represent current GHG reporting requirements and provide GHG calculation functionality for the *default* calculation methodologies described in the *TSD*.

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[1] *Public Protocol*, p 57.

Default methodologies are implemented unless facility-, agency-, or supplier-specific data are optional and available. When the use of specific data sources is optional and available, TVA may consider using the advanced methodologies to increase the accuracy of its inventory. Appendices B, C, and D of the *TVA Comprehensive GHG Reporting Plan* provide the default and advanced methodologies to calculate TVA's Scope 1, 2, and 3 emissions respectively.

For voluntary reporting categories, the *GHG Reporting Portal* will not calculate the associated emissions. These emissions should be calculated and manually entered into the *GHG Reporting Portal* using appropriate methodologies or Agency-specific tools. TVA should ensure that any reported voluntary emissions also conform to the methods and procedures described in *Federal GHG Accounting and Reporting Guidance* and related *TSD*.

4.0 Data Collection and Data Quality

Data are the basic information on activity levels, emission factors, processes, and operations. Although methods need to be appropriately rigorous and detailed, data quality is important. No method can compensate for poor quality input data. The design of the *TVA Comprehensive GHG Accounting and Reporting Plan* is intended to facilitate the collection of high-quality inventory data and the maintenance and improvement of collection procedures. Data collection and data quality activities can include:

- Developing the approach and assign roles and responsibilities to facilitate collection of high-quality inventory data
- Creating a process for the maintenance and improvement of data collection procedures.

When possible, data required for emissions calculations will be exported from existing programs and collections systems such as *FEMP Energy Report* and the *FAST* system. In preparation of submitting the annual inventory through the *GHG Reporting Portal*, the Comprehensive GHG Inventory Manager (CGIM) along with assistance from other managers should cross-check all data that is input automatically or manually into the *GHG Reporting Portal* against the documentation submitted to the CGIM describing the source and basis for the input data.

To address potential quality issues, year-to-year comparisons of activity data, historical comparisons, and evaluations of activity data in general should be done by the CGIM to ensure that the data is appropriate for the accuracy needed for the GHG inventory. This type of comparison may be appropriate for the following TVA sources:

- Fluorinated gas (F-gas) procurement and recovery
- Mobile source fossil fuel and biofuel usage
- Employee business air travel emissions
- Employee business ground travel vehicle rentals
- Employee commuting distance and number of trips

For these categories, annual activity data differences exceeding twenty-percent should be confirmed. In these cases, the uncertainty of the GHG emissions associated with the activity in questions should also be evaluated to assess the potential impact on the quality of the overall GHG inventory, as well as the impact on any associated EO 13514 reduction targets.

For key source categories, comparisons of data from multiple sources, data reported under other regulatory programs, or other estimates should be done by the CGIM to verify that these

emissions estimates are within a reasonable range for calculation. This type of activity may be appropriate for the following TVA sources:

- Goal Subject building energy use
- Goal Exempt building energy use
- Power Generation Asset GHG emissions
- Contracted Municipal Solid Waste disposal
- Number of TVA employees

Each of these data categories contributes a greater share to the emission reduction targets in EO 13514, or the overall inventory. As a result, differences exceeding ten-percent from other reporting or from the previous year should be scrutinized more thoroughly. In these cases, the uncertainty of the GHG emissions associated with the activity in question should also be evaluated to assess the potential impact on the quality of the overall GHG inventory, as well as the impact on any associated EO 13514 reduction targets.

Data source verification and quality management checklists are included in Section 6.

5.0 Inventory Processes and Systems (Preparation of GHG Inventory)

These are the institutional, managerial, and technical procedures for preparing GHG inventories. They include the team and processes charged with the goal of producing a high-quality inventory. To streamline GHG inventory quality management, these processes and systems should be integrated, where appropriate, with other organizational processes related to quality. Inventory Processes and Systems activities can include:

- Defining all institutional, managerial, and formal procedural aspects required to develop and maintain a GHG inventory that meets the *PS P* accounting and reporting standard.
- Whenever reasonable, integrate these processes with other organizational processes

TVA will follow and adhere to the stated guidelines and methodologies of the *Federal GHG Accounting and Reporting Guidance Technical Support Document (TSD)* to develop the annual GHG inventory. Effective, clear communication among the Comprehensive GHG Inventory Manager and the TVA contact for each reported activity should occur so that high-quality data may be obtained for inventory reporting.

Prior to beginning data collection, the organizational and operational boundaries should be reviewed to determine if they have been applied correctly and consistently to the collection of activity data. If changes to the organization or operational boundaries have occurred since the last inventory, this should also be accounted for prior to data collection.

The *Federal Reporting Guidance* and *GHG Reporting Portal* should be reviewed to determine if changes have occurred since the last report. Any updated reporting methodologies should be incorporated into the appropriate activity data gathering system. The continued use of the selected default or advanced calculation methodologies for each activity should also be confirmed annually.

In the event there are new organization activities, technical information, and/or reporting requirements, TVA may need to recalculate its baseline emissions. If such event(s) occur, TVA must identify the need and provide reasoned support for Agency-specific recalculation of its

baseline emissions. These actions should be provided to CEQ and OMB with sufficient notice to allow for a timely determination as to whether the requested changes are necessary. The reasoning that must be provided to CEQ and OMB should consist of a narrative description that explains the reasons for a recalculation and provides a quantitative description of the impact of such changes on the Agency's emissions inventory.

The inventory is to be submitted by January 31 for each preceding fiscal year. The approximate schedule of activities is outline below:

- ***August***: Review the *CEQ Reporting Guidance* and the prior year submittal for changes to organizational boundaries, calculation methodologies, additional activity reporting, and other changes potentially requiring baseline recalculation or the use of different activity data from the previous submittal.
- ***September***: Consult with each TVA contact to confirm the required activity data will be available in early October. Notify CEQ and OMB if baseline recalculation is required.
- ***October***: Complete quality assurance activities on all calculation tools (e.g., spreadsheets) used to compile and aggregate activity data for use in the *GHG Reporting Portal*. Recalculate baseline and previous year submissions if required.
- ***November:*** TVA contacts should provide activity data to the CGIM for the *Reporting Portal*. The supporting documentation should also be provided for each activity by mid-November.
- ***December:*** Complete the preliminary *Reporting Tool* and generate a draft inventory for quality assurance purposes.
- ***January***: Complete quality assurance activities and present GHG inventory to SSPP Manager and Environmental Sustainability Manager. Inventory submittal and certification by SSO.

Following completion and submittal of the annual inventory, the CGIM will meet with TVA contacts to review the previous year submittal. The review may include an overview of established procedures and methods, consideration of advanced calculation methodologies and optional/voluntary reporting categories, opportunities to stream line data gathering and transmittal, potential improvements to data quality, and involvement of additional TVA resources. The review may be conducted individually or in a group.

6.0 Documentation

This is the record of methods, data, processes, systems, assumptions, and estimates used to prepare an inventory. It includes everything employees need to prepare and improve TVA's inventory. Because estimating GHG emissions are inherently technical (involving engineering and science) and data intensive, high-quality, transparent documentation is particularly important for credibility. If information is not credible or fails to be effectively communicated to internal and external stakeholders, it will not have value. EO 13514 Greenhouse Gas Inventory documentation activities can include:

- Identifying data requirements and documentation of procedures for obtaining the data, including data sources and contact information for key personnel
- Identifying internal and external audiences and developing procedures to document information intended for their use
- Establishing documentation sufficient for an inventory development team to accurately and efficiently continue preparing and improving all four fundamentals in TVA's inventory

- Ensuring that documentation provides sufficient transparently to facilitate potential internal or external verification.

The CGIM should verify that all activity data input, emission estimates, and assumptions are appropriate and justifiable for reporting purposes. The CGIM should also ensure each TVA contact provides supporting documentation needed for each activity parameter. The CGIM should maintain all documentation of activity data and documentation of completed quality assurance activities.

Table 1 - Reporting Period Information (Number of Employees, Total Square Feet)

Input Data	Source	TVA Contact	Notes
Number of employees, contractors, and visitors	Human Resources	Rebecca Stansberry (865-632-4400)	
Total square feet of Goal Subject Buildings	FEMP Energy Report	Clay Hoover (615-232-6862)	
Total square feet of Goal Excluded Buildings	FEMP Energy Report	Clay Hoover (615-232-6862)	
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the HR and Building input data	• **HR**-- 12/17/2012 • **Buildings**-- 01/09/2013 01/24/13	CAA	• **HR**--Employees by Location FY 2012 v1.xlsx • **Buildings**--Tririga Annual Report FY12 V(01_04_13)V2.xlsx
Validate input data prior to calculating GHG emissions to check for outliers	01/24/13	CAA	
Data Documentation			
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	CAA	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	CAA	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	CAA	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	CAA	
Checked that conversion factors are correct.	01/24/13	CAA	
Checked the data processing steps (e.g., equations) in the data spreadsheets.	01/24/13	CAA	
Checked a representative sample of calculations, by hand or electronically in the data spreadsheet	01/24/13	CAA	
Had a staff member who was not involved in the development of this data to spot check entry in *GHG Reporting Tool*	01/24/13	[illegible]	

Table 2 - Scope 1 Stationary Combustion Emissions (default methodology)

Input Data	Source	TVA Contact	Notes
Goal Subject Buildings - fuel by type/category	FEMP Energy Report	Clay Hoover (615-232-6862)	
Goal Excluded Buildings - fuel by type/category	FEMP Energy Report	Clay Hoover (615-232-6862)	
Commercial Power/Steam Generation not included in FEMP - fuel by type/category	EPA MRR records	Brian Fowler (423-751-3712)	GHGRP calculation methodology
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the input data	• **Buildings--** 01/09/2013 • **Commercial Power/Steam Generation**-- 1/13/2012 01/24/13	CAA	• **Buildings--** Tririga Annual Report FY12 V(01_04_13)V2.xlsx • **Commercial Power/Steam Generation**--EPA MRR (40 CFR Part 98)
Validate input data prior to calculating GHG emissions to check for outliers	01/24/13	CAA	
Ensured that adequate version control procedures for electronic files have been implemented.	01/24/13	CAA	
Data Documentation			
Confirmed that bibliographical data references are included in spreadsheets for all primary data.	01/24/13	CAA	
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	CAA	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	CAA	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	CAA	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	CAA	
Checked that conversion factors are correct.	01/24/13	CAA	
Checked the data processing steps (e.g., equations) in the data spreadsheets.	01/24/13	CAA	
Checked a representative sample of calculations, by hand or electronically in the data spreadsheet	01/24/13	CAA	
Had a staff member who was not involved in the development of this data to spot check entry in *GHG Reporting Tool*	01/24/13	[illegible]	

Table 3 - Scope 1 Mobile Source Emissions (default methodology)

Input Data	Source	TVA Contact	Notes
FAST fuel by type/category	Comdata card roll-up	Daniel Tackling (423-751-1048)	Fleet and OTR vehicles
Non-FAST fuel by type/category	PS Energy	Daniel Tackling (423-751-1048)	
Aviation Fuel	Rotating Wing, and Comdata	Daniel Tackling (423-751-1048)	John Griffith (865-980-0271) Yvonne King (256-386-3504)
E85		Daniel Tackling (423-751-1048)	
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the input data	• **FAST--** 01/05/2013 • **Non-FAST--** 01/05/2013 01/24/13	CAA	• **FAST/Non-FAST/E85--** FY12 Total Fuel Data 1-5-2013 SLB.xlsx • **Aviation Fuel**-E-Mail
Validate input data prior to calculating GHG emissions to check for outliers	01/24/13	CAA	
Ensured that adequate version control procedures for electronic files have been implemented.	01/24/13	CAA	
Data Documentation			
Confirmed that bibliographical data references are included in spreadsheets for all primary data.	01/24/13	CAA	
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	CAA	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	CAA	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	CAA	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	CAA	
Checked that conversion factors are correct.	01/24/13	CAA	
Checked the data processing steps (e.g., equations) in the data spreadsheets.	01/24/13	CAA	
Checked a representative sample of calculations, by hand or electronically in the data spreadsheet.	01/24/13	CAA	
Had a staff member who was not involved in the development of this data to spot check entry in *GHG Reporting Tool*	01/24/13	[illegible]	

Table 4 - Scope 1 Fugitive Emissions: Refrigerants and Fluorinated Gases (default methodology)

Input Data	Source	TVA Contact	Notes
Amount of each F-gas issued from procurement and storage	Facility records	Casey Cothron (423-751-2652)	David Smith (423-751-4785)
Amount of each F-gas recovered and returned to storage	Facility records	Casey Cothron (423-751-2652)	David Smith (423-751-4785)
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the input data	12/21/2012 01/24/13	CAA	Refrigerants - FY 2012 - Used For Reporting.xlsx
Validate input data prior to calculating GHG emissions to check for outliers	01/24/13	CAA	
Ensured that adequate version control procedures for electronic files have been implemented.	01/24/13	CAA	
Data Documentation			
Confirmed that bibliographical data references are included in spreadsheets for all primary data.	01/24/13	CAA	
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	CAA	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	CAA	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	CAA	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	CAA	
Checked that conversion factors are correct.	NA		
Checked the data processing steps (e.g., equations) in the data spreadsheets.	01/24/13	CAA	
Checked a representative sample of calculations, by hand or electronically in the data spreadsheet	01/24/13	CAA	
Had a staff member who was not involved in the development of this data to spot check entry in *GHG Reporting Tool*	01/24/13	[illegible]	

Table 5 - Scope 1 Fugitive Emissions: On-site Wastewater Treatment (default methodology)

Input Data	Source	TVA Contact	Notes
Type of treatment system	Wastewater	Linden Johnson (423-751-3361)	Chris Azar (423-751-4814)
Population served	Human Resources	Rebecca Stansberry (865-632-4400)	
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the input data	• **Wastewater**-- 01/04/2013 • **Population Served**-- 01/04/2013 01/24/13	CAA	• **Wastewater**-- Employees by Location FY 2012 v1.xlsx • **Population Served**-- Employees by Location FY 2012 v1.xlsx
Validate input data prior to calculating GHG emissions to check for outliers	01/24/13	CAA	
Ensured that adequate version control procedures for electronic files have been implemented.	01/24/13	CAA	
Data Documentation			
Confirmed that bibliographical data references are included in spreadsheets for all primary data.	01/24/13	CAA	
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	CAA	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	CAA	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	CAA	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	CAA	
Checked that conversion factors are correct.	01/24/13	CAA	
Checked the data processing steps (e.g., equations) in the data spreadsheets.	01/24/13	CAA	
Checked a representative sample of calculations, by hand or electronically in the data spreadsheet	01/24/13	CAA	
Had a staff member who was not involved in the development of this data to spot check entry in *GHG Reporting Tool*	01/24/13	[illegible]	

Table 6 - Scope 1 Optional Emissions: Direct CO_2 Emissions from pH Adjustment (default methodology)

Input Data	Source	TVA Contact	Notes
Amount of CO_2 purchased	Procurement or Purchasing	Linden Johnson (423-751-3361)	Chris Azar (423-751-4814)
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the input data	01/15/2013 01/24/13	CAA	CO2 Table CY 2012-01-15-2013.xlsx
Validate input data prior to calculating GHG emissions to check for outliers	01/24/13	CAA	
Ensured that adequate version control procedures for electronic files have been implemented.	01/24/13	CAA	
Data Documentation			
Confirmed that bibliographical data references are included in spreadsheets for all primary data.	01/24/13	CAA	
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	CAA	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	CAA	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	CAA	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	CAA	
Checked that conversion factors are correct.	01/24/13	CAA	
Checked the data processing steps (e.g., equations) in the data spreadsheets.	01/24/13	CAA	
Checked a representative sample of calculations, by hand or electronically in the data spreadsheet	01/24/13	CAA	
Had a staff member who was not involved in the development of this data to spot check entry in *GHG Reporting Tool*	01/24/13	[illegible]	

Table 7 - Scope 2: Purchased Electricity Consumption (default methodology)

Input Data	Source	TVA Contact	Notes
Goal Subject building purchased electricity by eGRID subregion	FEMP Energy Report	Clay Hoover (615-232-6862)	
Goal Excluded building purchased electricity by eGRID subregion	FEMP Energy Report	Clay Hoover (615-232-6862)	
Electric vehicle and equipment purchased electricity	FAST - alternative fuel use	Daniel Tackling (423-751-1048)	Not addressed in TSD
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the input data	• **GS Purchased Electricity / GE Purchased Electricity / EV Purchased Electricity**--01/09/2013 01/24/13	CAA	• **GS Purchased Electricity / GE Purchased Electricity / EV Purchased Electricity**--Tririga Annual Report FY12 V(01_04_13)V2.xlsx
Validate input data prior to calculating GHG emissions to check for outliers	01/24/13	CAA	
Ensured that adequate version control procedures for electronic files have been implemented.	01/24/13	CAA	
Data Documentation			
Confirmed that bibliographical data references are included in spreadsheets for all primary data.	01/24/13	CAA	
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	CAA	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	CAA	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	CAA	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	CAA	
Checked that conversion factors are correct.	01/24/13	CAA	
Checked the data processing steps (e.g., equations) in the data spreadsheets.	01/24/13	CAA	
Checked a representative sample of calculations, by hand or electronically in the data spreadsheet	01/24/13	CAA	
Had a staff member who was not involved in the development of this data to spot check entry in *GHG Reporting Tool*	01/24/13	KWL	

Table 8 - Scope 2: Purchased Renewable Energy and RECs (default methodology)

Input Data	Source	TVA Contact	Notes
Purchased RECs by eGRID subregion	FEMP Energy Report	Chris Azar (423-751-4814)	Susan Elder (423-751-3995)
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the input data	• **Renewable**--01/04/2013 • **HMOD**--12/17/2012 01/24/13	CAA	• **Renewable**--Renewable Information - FY 2012.xlsx • **HMOD**--HMOD MWh Projections 2012 - From Susan Elder.xlsx
Validate input data prior to calculating GHG emissions to check for outliers	01/24/13	CAA	
Ensured that adequate version control procedures for electronic files have been implemented.	01/24/13	CAA	
Data Documentation			
Confirmed that bibliographical data references are included in spreadsheets for all primary data.	01/24/13	CAA	
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	CAA	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	CAA	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	CAA	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	CAA	
Checked that conversion factors are correct.	01/24/13	CAA	
Checked the data processing steps (e.g., equations) in the data spreadsheets.	01/24/13	CAA	
Checked a representative sample of calculations, by hand or electronically in the data spreadsheet	01/24/13	CAA	
Had a staff member who was not involved in the development of this data to spot check entry in *GHG Reporting Tool*	01/24/13	KRH	

Table 9 - Scope 3: Federal Employee Business Air Travel (default methodology)

Input Data	Source	TVA Contact	Notes
GHG Emissions	GSA Travel MIS Report	GSA - Pratreek Mittal (703-605-2164) World Travel Service – Holli Gribble (865-777-1625)	Brandon Rogers (423-751-7603)
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the input data	12/21/2012 01/24/13	CAA	AR FY 2012 Air Travel CO2 Emissions 12-21-2012.pdf
Validate input data prior to calculating GHG emissions to check for outliers	01/24/13	CAA	
Ensured that adequate version control procedures for electronic files have been implemented.	01/24/13	CAA	
Data Documentation			
Confirmed that bibliographical data references are included in spreadsheets for all primary data.	01/24/13	CAA	
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	CAA	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	CAA	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	CAA	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	CAA	
Checked that conversion factors are correct.	01/24/13	CAA	
Checked the data processing steps (e.g., equations) in the data spreadsheets.	01/24/13	CAA	
Checked a representative sample of calculations, by hand or electronically in the data spreadsheet	NA		
Had a staff member who was not involved in the development of this data to spot check entry in *GHG Reporting Tool*	01/24/13	[illegible]	

Table 10 - Scope 3: Contracted Municipal Solid Waste Disposal (defaultt methodology)

Input Data	Source	TVA Contact	Notes
Mass of solid waste disposed	EO 13514 Report to OFEE	Dana Vaughn (865-632-3102)	
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the input data	12/21/2012 01/24/13	CAA	E-Mail
Validate input data prior to calculating GHG emissions to check for outliers	01/24/13	CAA	
Ensured that adequate version control procedures for electronic files have been implemented.	NA	CAA	
Data Documentation			
Confirmed that bibliographical data references are included in spreadsheets for all primary data.	01/24/13	CAA	
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	CAA	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	CAA	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	CAA	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	CAA	
Checked that conversion factors are correct.	NA		
Checked the data processing steps (e.g., equations) in the data spreadsheets.	NA		
Checked a representative sample of calculations, by hand or electronically in the data spreadsheet	NA		
Had a staff member who was not involved in the development of this data to spot check entry in *GHG Reporting Tool*	01/24/13	[signature]	

Table 11 - Scope 3: Federal Employee Business Ground Travel (default methodology)

Input Data	Source	TVA Contact	Notes
Number of passenger car vehicle rentals	GSA Travel MIS Report	GSA –Pratreek Mittal (703-605-2164)	Brandon Rodgers (423-751-7603)
Number of light-truck/SUV vehicle rentals	GSA Travel MIS Report	GSA -Pratreek Mittal (703-605-2164)	Brandon Rodgers (423-751-7603)
Expensed Reimbursed Mileage		Thomas Hammontree (865-632-2292) Allison Cragen (865-632-3581)	Brandon Rodgers (423-751-7603)
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the input data	• **Passenger Car Rentals / Light-Truck/SUV Rentals**--12/21/2012 • **Expensed Reimbursed Mileage**--12/21/2012 01/24/13	CAA	• **Passenger Car Rentals / Light-Truck/SUV Rentals**--AR FY 2012 Ground Business Miles Traveled 12-21-2012.pdf • **Expense reimbursed mileage**— Info from ERS for POV Travel for Business - FY 2012 - 12-21-12.xlsx
Validate input data prior to calculating GHG emissions to check for outliers	01/24/13	CAA	
Identified spreadsheet modifications that could provide additional controls for data protection or checks on quality.	01/24/13	CAA	
Ensured that adequate version control procedures for electronic files have been implemented.	01/24/13	CAA	
Data Documentation			
Confirmed that bibliographical data references are included in spreadsheets for all primary data.	01/24/13	CAA	
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	CAA	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	CAA	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	CAA	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	CAA	
Checked that conversion factors are correct.	NA		
Checked the data processing steps (e.g., equations) in the data spreadsheets.	NA		
Checked a representative sample of calculations, by hand or electronically	NA		

in the data spreadsheet			
Had a staff member who was not involved in the development of this data to spot check entry in GHG Reporting Tool	01/24/13		

Table 12 - Scope 3: Federal Employee Commuting (default methodology)

Input Data	Source	TVA Contact	Notes
Number of passengers by mode (POV, van pool, bus, rail, walking, etc.)	Expense Reimbursement	Thomas Hammontree (865-632-2292)	Dana Vaughn (865-632-3102)
Number of employees participating in Telework Program	Telework Program	Linda Sales-Long (865-632-4958)	Dana Vaughn (865-632-3102)
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the input data	• **Ride-Share**--01-08-2013 01/24/13	~~CAA~~	• **Ride-Share**--E-Mail
Validate input data prior to calculating GHG emissions to check for outliers	01/24/13	~~CAA~~	
Ensured that adequate version control procedures for electronic files have been implemented.	NA		
Data Documentation			
Confirmed that bibliographical data references are included in spreadsheets for all primary data.	01/24/13	~~CAA~~	
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	~~CAA~~	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	~~CAA~~	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	~~CAA~~	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	~~CAA~~	
Checked that conversion factors are correct.	01/24/13	~~CAA~~	
Checked the data processing steps (e.g., equations) in the data spreadsheets.	01/24/13	~~CAA~~	
Checked a representative sample of calculations, by hand or electronically in the data spreadsheet	01/24/13	~~CAA~~	
Had a staff member who was not involved in the development of this data to spot check entry in *GHG Reporting Tool*	01/24/13	~~KGH~~	

Table 13 - Scope 3: Contracted Wastewater Treatment (default methodology)

Input Data	Source	TVA Contact	Notes
Population served	Human Resources	Rebecca Stansberry (865-632-4400)	
Quality Measure	**Date of Completion**	**Reviewer Initials**	**Comments**
Data Collection and Input			
Verify the source of the input data	01/04/2013 01/24/13	CAA	Employees by Location FY 2012 v1.xlsx
Validate input data prior to calculating GHG emissions to check for outliers (e.g., impossibly high fuel economy rates for vehicles)	01/24/13	CAA	
Identified spreadsheet modifications that could provide additional controls for data protection or checks on quality.	01/24/13	CAA	
Ensured that adequate version control procedures for electronic files have been implemented.	01/24/13	CAA	
Data Documentation			
Confirmed that bibliographical data references are included in spreadsheets for all primary data.	01/24/13	CAA	
Checked that assumptions and criteria for selection of boundaries, base year, methods, activity data, and other parameters are documented.	01/24/13	CAA	
Checked that changes in data or methods are documented and submitted to CEQ and OMB.	01/24/13	CAA	
Emissions Calculation and Verification			
Checked whether emission units, parameters, and conversion factors are appropriately labeled.	01/24/13	CAA	
Checked whether units are properly labeled and correctly carried through from the beginning to the end of calculations.	01/24/13	CAA	
Checked that conversion factors are correct.	NA		
Checked the data processing steps (e.g., equations) in the data spreadsheets.	NA		
Checked a representative sample of calculations, by hand or electronically in the data spreadsheet	NA		
Had a staff member who was not involved in the development of this data to spot check entry in GHG Reporting Tool	01/24/13	JCH	