

# **Tennessee Valley Authority Annual Report on Energy Management FY 2008**

(Including Department of Energy  
Reporting Guidance and Outline)

Electronic draft 12-30-2008  
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Including - 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.

**John E. Long, Jr. is the designated Senior Energy Official and Executive Vice President of Administrative Services.**

**Stephen L. Brothers is the designated Chief Energy Manager and manages the TVA Internal Energy Management Program (IEMP) under Administrative Services.**

**David R. Zimmerman is the manager of Sustainable Design under Administrative Services.**

- 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.

**TVA formed the Agency Energy Management Committee (AEMC) to 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 AEMC 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 AEMC provides an avenue for sharing lessons learned and replicating success. The members are:**

- **Stephen L. Brothers, chairperson for the AEMC;**
- **Tina I. Broyles, Power Systems Operations;**
- **David R. Chamberlain, Customer Resources;**
- **Sherri R. Collins, Office of General Counsel;**
- **Annemarie C. Smith, Government Relations;**
- **Jonnie A. Cox, Facilities Management Projects;**
- **Joe H. Dempsey, Central Support and Repair Heavy Equipment Division;**
- **David R. Dinse, Research and Technology Applications;**
- **Laura M. Duncan, Office of Environment and Research;**
- **Janet H. Keith, Transportation Services;**
- **Steven S. Long, Fossil;**
- **Justin C. Maierhofer, Government Relations;**
- **Michael B. McDowell, Nuclear;**
- **William R. McNabb, Facilities Management O&M;**
- **L. Jim Miller, River Operations;**
- **Allard J. Nayadley, Customer Resources;**

- Aaron B. Nix, Facilities Management Environmental;
- James S. Paris, Information Services;
- David D. Smith, Facilities Management;
- Stacey R. Stewart, Financial Services;
- Bruce E. Vincent, Transportation; and
- David R. Zimmerman, Sustainable Design.

## B. Management Tools

1. **Awards (Employee Incentive Programs).** Describe the agency's use of employee incentive programs to reward exceptional performance in implementing Executive Order (E.O.) 13423.

**TVA utilizes a "Winning Performance" process as a method to reward employees' efforts toward meeting agency 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 an avenue for employees to be recognized for their outstanding efforts including awards for engineer of the year and environmental excellence.**

2. **Performance Evaluations.** Describe agency efforts to include successful implementation of provisions of Executive Order 13423 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 and the Energy Independence and Security Act of 2007, their job descriptions contain reflective line items and their 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. This reporting is required by a section of Energy Policy Act of 1992 (42 U.S.C. § 8262c) that is still in effect. (Note: The expenditures and number of employees trained will be reported on the agency's Data Report.) Describe agency outreach programs that include education, training, and promotion of ENERGY STAR<sup>®</sup> and other energy efficient and low standby power products for Federal purchase card users.

**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. A facility poster campaign has been implemented which shows employees their impact on a facilities energy use compared to previous years. The campaign uses posters placed in the lobbies of major energy-using facilities which show monthly energy use and energy saving tips. 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 provided to employees, managers, and TVA customers upon request. TVA also educates staff on energy and environmental related topics through the TVA Training and Development Organization.**

TVA's Customer Resources (CR) is responsible for TVA products, services, and programs to better satisfy our customers. There are 158 distributors that resell TVA power to consumers—108 municipal utility companies and 50 cooperatives. The municipal utilities (munis) make up the largest block of CR customers. Cooperatives (co-ops) are customer-owned companies, many of which were originally formed to bring electricity to the farthest reaches of the Valley. The co-ops and the munis represent the wholesale base of TVA's business, accounting for about 83 percent of TVA's revenue. Section 5, "Other Energy and Related Environmental Initiatives," contains information on CR initiatives for the customer.

Also in CR, TVA's Energy Efficiency & Demand Response (EEDR) organization is focused on new products that will allow TVA to achieve its demand-reduction goals going forward - including a 1400 MW reduction. The new EEDR organization will operate on a larger scale to design and deliver products that will benefit customers, consumers and the TVA system. EEDR is comprised of five key areas: Efficiency Program Design; Energy Efficiency and Demand Response Delivery; End-Use Generation and Storage; Demand Response and Market and Program Analysis.

4. **Showcase Facilities.** Highlight exemplary new or existing facilities that the agency has designated Showcase Facilities. Describe why the facilities are considered Showcase Facilities (i.e., discuss the facility design, the improvements made in energy or water efficiency, the use of renewable energy, etc.).

The combinations of original design elements, energy and environmental activities, and aggressive energy reduction operation and maintenance efforts have resulted in the Chattanooga Office Complex (COC) remaining a model facility in TVA. The COC was completed in 1986 and encloses approximately 1.2 million square feet of floor area. It is made up of five interconnected buildings (Signal Place, Lookout Place, Blue Ridge, Missionary Ridge, and Monteagle Place), and integrates the use of passive energy strategies, energy management practices, and environmental programs and activities. Occupants' daily activities have been recognized as a major component in facility performance. Energy and environmental awareness programs, such as the poster campaign on facility energy use, have been established to inform the occupants of the impacts their actions have on this performance.

TVA continues to investigate energy efficiency measures and has implemented measures which include:

- Better placement of task lights resulting in reduction of numbers used;
- Demonstration of digital lighting controls which can be operated from the users PCs;
- Orientation of offices to better utilize daylighting over mechanical lighting;
- Use of more efficient T5 lighting in place of existing T8 and T12;
- Use of more efficient flat panel displays in place of conventional cathode ray tube displays;
- Testing of innovative lighting and control systems; and
- Use of occupancy sensors in individual office spaces.

## ENERGY MANAGEMENT AND ASSOCIATED ENVIRONMENTAL EFFORTS

The COC's low energy consumption rate supports the reduction of CO<sub>2</sub> and other environmental impacts at the source. Since initial construction, additional energy and environmental improvements have been implemented in the COC. One of these improvements was the design and installation of a chilled and hot water storage system for the COC and Monteagle Place (MP) buildings. The system allows the two buildings, through a symbiotic relationship, to better use site energy and reduce the need for source energy.

### COC Original Design Features:

- VAV air handlers with full economizer capabilities;
- Energy Management and Control System (HVAC, Lighting, Fire);
- Heat recovery from MP chillers;
- Approximately 30 footcandles of ambient lighting supplemented with daylighting and task lighting;
- Renewable energy attributes such as daylighting; and
- Thermal storage through structural and fluid mass.

### Additional Improvements:

- Chilled water crossover piping allows the COC and adjacent facility to share chilled water and run the most efficient mix of chillers;
- Water fountains are heated and cooled through heat exchangers to better manage temperature and humidity in the building;
- Motion sensors and timers have been installed in the COC (i.e., conference rooms, restrooms, enclosed offices, closets, etc.);
- LED exit lights have been installed;
- Energy efficient lighting has been added;
- COC storage tanks are used for chilled and hot water storage (3 x 19,000 gallons);
- Heat exchangers and chilled water were used to cool the secondary water loop allowing the abandonment of rooftop evaporative coolers and associated fans, motors, and sump heaters;
- Equipment (i.e., fixtures, motors, ballasts, chillers etc.) was upgraded to energy efficient models as failures occurred;
- Variable Frequency Drives (VFDs) and energy efficient motors have been installed on all large air-handling units;
- The energy management system has been upgraded to be more user friendly;
- Chiller efficiencies have been evaluated so the most energy efficient mix of chillers can be run for operating conditions;
- Upgrading to more energy efficient equipment is evaluated during modifications (fixtures with T-8 lamps and electronic ballasts, etc.);
- Energy efficient motors are installed where applicable;
- During purchase of replacement parts, energy efficient and environmentally friendly materials were ordered and stocked;
- Chillers have been retrofitted to accept non-CFC refrigerant;
- Energy Star® equipment was installed where applicable; and
- Building entry air locks with automated doors have been installed to reduce the infiltration of outside air.

## **ENVIRONMENTAL PROGRAMS AND ACTIVITIES**

**TVA demonstrates a commitment to environmental stewardship through the implementation of its environmental programs and activities at the COC. Examples of these efforts include, but are not limited to, toxic reduction, affirmative procurement, waste minimization, and recycling.**

### **Toxic Reduction:**

**TVA continues its efforts to reduce the amount of toxic chemicals used in its operation and maintenance activities for the building. The volume of toxic chemicals purchased in corporate office buildings has been reduced by over ninety percent since 1995. The COC is the largest single contributor to this effort.**

### **Affirmative Procurement:**

**TVA reduces environmental impacts at the COC and other facilities through affirmative procurement of materials with recycled content. TVA's Affirmative Procurement Plan has been upgraded to the Green Procurement Plan which includes EPAAct05, EISA 2007 and other federal requirements. In FY08, TVA spent \$4.58 million on 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) and spent \$51.19 million on other recycled materials, meeting guidelines established under the Resource Conservation and Recovery Act (RCRA).**

### **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; and**
- 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 2008, TVA generated 22,103 tons of municipal solid waste in facilities including the COC. Of that solid waste, TVA generated 657 metric tons of office recyclables which includes mixed paper, plastics, aluminum, cardboard and glass. 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. This carpet uses high performance backing made from one hundred percent recycled content. TVA has an agreement with the carpet manufacturer to recycle carpet removed from the COC, keeping used TVA facility carpet out of landfills in addition to saving an equivalent amount in raw materials.**

5. **Other Energy and Related Environmental Initiatives:** Highlight new or existing energy and related environmental initiatives that the agency has accomplished in FY 2008. Provide a brief description of these initiatives.

#### INDUSTRIAL INITIATIVES

TVA provides end use technical assistance to its direct-served and distributor-served industrial customers. TVA works with these clients to help them identify and solve problems related to their use of energy in areas such as: manufacturing processes, environmental issues and plant operations. The targeted segments, such as the automotive, machinery, forest products and food processing industries, as well as local water and wastewater treatment systems, are selected because of the large presence of such industries in the TVA service area, their high energy usage, or the availability of solutions for their existing problems. The TVA industrial marketing managers rely primarily on in-house expertise, but sometimes bring in consultants to assist these industrial clients.

The following is an example of TVA energy assistance to industrial customers:

TVA representatives developed and co-chaired an in-house energy conservation team to identify and implement energy cost savings opportunities at the GM Spring Hill automobile assembly plant. The team has achieved savings of over \$11.3 million since the beginning of the initiative nine years ago. This includes electricity demand reduction of 1.0 MW in FY 2008.

#### COMMERCIAL INITIATIVES

TVA works with Tennessee Valley commercial and institutional customers to provide solutions to their energy-related problems and to encourage the selection of energy efficient equipment. For example, TVA is working with schools, governments, offices, retail, healthcare, and other commercial segments to provide information on the various energy options available to them. As part of that effort, TVA provides feasibility studies conducted by independent private sector professional engineers to compare different types of systems on a life-cycle-cost basis. Furthermore, TVA sponsors continuing education for Tennessee Valley architects and engineers on the proper design and application of geothermal heat pumps. In the TVA service area, there are approximately 308 geothermal systems installed or in design as the result of TVA's promotion of this energy efficient technology. Demand for TVA assistance to commercial customers on energy-related problems continues to grow.

#### RESIDENTIAL INITIATIVES

TVA and its 158 public power distributors have a long history of residential energy-efficiency programs for the Valley. These programs are currently marketed under the brand name *energy right*<sup>®</sup>. More information is available at the *energy right* website ([www.energyright.com](http://www.energyright.com)).

Participation in the various initiatives under the *energy right*<sup>®</sup> Program includes over 150 distributors. These initiatives are described below:

New Homes Plan promotes all-electric, energy-efficient new homes. All homes built *energy right*<sup>®</sup> must meet a minimum rating in overall energy efficiency. Homes built at least 15 percent better than the minimum rating qualify as *energy right*<sup>®</sup> while those built 30 percent

better qualify as *energy right*<sup>®</sup> Platinum or *energy right*<sup>®</sup> Platinum Certified. Since the summer of 2005, when TVA began an *energy right* Platinum Certified certification promotion (which equates to ENERGY STAR<sup>®</sup>), over 2,400 homes have been certified to date through 22 participating power distributors. (FY 2008 installations: *energy right*<sup>®</sup> – 4,636 units; *energy right*<sup>®</sup> Platinum – 800 units; *energy right*<sup>®</sup> Platinum Certified – 599 units)

**Heat Pump Plan** promotes the installation of high efficiency heat pumps in homes and small businesses. Installation, performance, and weatherization standards have been established to ensure the comfort of the customer and the proper operation of the system. A Quality Contractor Network has been established for maintaining high installation standards. Through a third-party lender, TVA provides ten-year financing for residential heat pumps with repayment through the consumer's electric bill. (FY 2008 installations: 8,749.)

**Water Heater Plan** promotes the installation of energy-efficient electric water heaters in homes and small businesses. (FY 2008 installations: 13,452.)

**New Manufactured Homes Plan** promotes the installation of high efficiency 13 SEER heat pumps in new manufactured homes. TVA is also conducting an ENERGY STAR<sup>®</sup> Manufactured Homes pilot with MHRA (Manufactured Housing Research Alliance) to promote ENERGY STAR<sup>®</sup> homes in the Valley. (FY 2008 installations: 2,262 *energy right*<sup>®</sup> units, plus 14 ENERGY STAR<sup>®</sup> units.)

**In Concert With The Environment** (in partnership with Aclara) is a comprehensive environmental and energy education program directed to middle school and junior high school students. Student participants receive an energy survey to complete for their households. Results from the survey indicate the home's estimated annual and monthly energy usage by appliance and give a number of energy, environmental and water recommendations for the student and their family to implement. (FY 2008 audits: 937.)

***energy right* Home e-valuation**<sup>®</sup> (in partnership with Aclara) allows residential customers to play an active role in saving energy in their homes. After completing an energy survey, customers receive a personalized report that breaks down the home's annual and monthly energy usage by appliance, and gives a number of energy recommendations as well as information about distributor products and services. Additionally, each customer who completes the survey is mailed an energy conservation kit. (FY 2008 audits: 10,067.)

**Energy Depot for Homes** (in partnership with Enercom) is a web-based home energy audit for residential customers to complete interactively. Customers complete the survey and receive a detailed analysis of their energy use based on their answers and local electric and average gas rates. The analysis report also gives a number of energy recommendations. Additionally, each customer who completes the audit is mailed an energy conservation kit. (FY 2008 audits: 26,433.)

**Energy Depot for Business** (in partnership with Enercom) is a web-based energy audit for small business customers to complete interactively via the Web. Customers complete the survey and receive a detailed analysis of their energy use based on their answers and local electric and average gas rates. The analysis report also gives a number of energy recommendations. (FY 2008 user sessions: 21,913.)

**Energy Depot for Homes Comparison Tool** (in partnership with Enercom) provides residential customers with a way to compare energy use, costs, potential savings and paybacks for replacing existing heating and air conditioning systems, water heating and lighting.

## **ENERGY SERVICES COMPANY (ESCO)**

Since 1997, TVA's Energy Services Company has worked with customers to achieve 43,122,000 kWh of energy efficiency savings and 14 MW of cumulative demand reduction through performance contracting projects. More than \$50 million in improvements have been made at military installations, state-owned buildings, and school systems in the Valley; at one base the energy savings now exceed \$1 million per year. Under these performance contracts, the equipment cost is funded through the resulting savings on the energy bills.

These industrial, commercial, ESCO, and residential programs accounted for an estimated 39.5 MW of demand reduction in FY 2008.

## **DEMAND RESPONSE**

### **RESIDENTIAL DIRECT LOAD CONTROL (DLC)**

TVA and 12 power distributors currently participate in a Residential Direct Load Control program that was initiated in the late 1970s. This program involves power distributors installing radio controlled or power line carrier switches on their customers' air-conditioners and water heaters. During peak demand periods, TVA is allowed to curtail the power to this equipment. The power distributors receive a monthly bill credit from TVA for each operable switch. Participating power distributors are allowed to determine the type of incentive given to their customers. TVA can curtail Approximately 19 MW of load upon demand with DLC. The future of DLC is being evaluated by TVA in relation to a larger, more modern, and more effective Demand Side Management initiative.

### **COMMERCIAL AND INSTITUTIONAL DEMAND RESPONSE**

During FY 2008, TVA initiated an agreement with a third party aggregator to manage and control energy consuming assets at user facilities, thus reducing peak demand when and where it is needed. This commercial, industrial, and institutional demand response program resulted in approximately 8 MW of peak reduction in FY2008, and is expected to expand in future years.

### **GREEN POWER SWITCH® (GPS)**

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

### **GENERATION PARTNERS**

TVA launched the GPS Generation Partners® Pilot in support of Green Power Switch®. Generation Partners® program pays participants for 100 percent of their green power output at a rate of 15 cents per kilowatt-hour for the generation produced from solar and wind installations on participants' home or small businesses. The energy from Generation Partners® contributes to TVA's supply of renewable energy. In FY 2004, GPS Generation Partners® was expanded to allow larger, demand-metered customers to participate with solar generation only.

As of September 30, 2008, there were 61 consumer-owned installations and 70 power distributors participating in the Generation Partners® pilot.

## **ENVIRONMENTAL SCIENCE, TECHNOLOGY & POLICY**

**In support of TVA's efforts to continually improve its operations, Environmental Science, Technology & Policy (EST&P) provides scientific and technological solutions to problems in the areas of generation, transmission and environmental compliance and evaluates emerging technologies that could benefit TVA and its customers in the future. TVA also works with partners in industry and academia 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.**

**EST&P promotes sustainability by partnering with TVA Facilities Management to test and showcase sustainable technologies.**

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

## **COMPUTER UPGRADES AND EFFICIENCY**

**TVA replaced older computers and monitors with more energy efficient models that use less energy. TVA purchased servers that are more energy efficient, and implemented server technology that reduces the quantity of servers required.**

- **PC Efficiency - TVA replaced approximately 3,100 computers in FY 2008 with units having both Energy Star® and Electronic Product Environmental Assessment Tool (EPEAT) Silver certifications. TVA standard desktop systems purchased met Energy Star® version 4.0 standards. TVA pursues additional energy efficiency by aggressively implementing 80 Plus power supplies and the most efficient chip technologies.**
- **Monitor Efficiency - TVA maintains standardized monitor management processes that automatically suspend inactive displays. Monitors purchased in FY 2008 were Energy Star®, Tier 2 registered LCD displays with EPEAT Silver certifications.**
- **Blade Server Standard - TVA has adopted a blade server standard. Blade servers require less power to operate than a comparable standalone server, and are mounted in an enclosure that lowers the power required to keep the servers cool.**
- **Through virtualization, TVA was able to consolidate approximately 250 servers into 50 servers, reducing the energy required to both power and cool this equipment. 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.**

## **EST&P RECENT HIGHLIGHTS/ACCOMPLISHMENTS**

- **The COC Lighting Demonstration Project was completed and monitored. The new lighting used high efficiency T-5 light fixtures that attached directly to the existing cubicle furniture. The lighting provided both up and down lighting and incorporated occupancy sensors, daylight harvesting sensors, custom programming of individual light fixtures and local real time control of the lighting by the occupants via computer interface. The monitoring data indicated that the new system achieved a savings of approximately 75% compared to the old system, with a similar demand savings. Occupants generally liked the new lighting better than the**

old system. The original system used a local network set up by the Information Technology education staff. Due to space changes, the system was relocated to the main complex this summer, and the supervisory software was placed, and is now operating on TVA's main network;

- Completing a performance evaluation and a survey of 20 passive acid drainage treatment systems built from 1985-1998;
- TVA was awarded a patent (patent number 6,751,959 B1) for the Advanced Low Temperature Power Cycle (ALTPC) technology. ALTPC technology is a highly efficient advanced technology that converts industrial waste heat to power in a cost effective manner. In 2007 TVA and Facilities Management Company, Inc (FMC) of Boston, MA executed a license agreement that gives FMC the exclusive license in the United States to build, own, operate, and market TVA's patented ALTPC technology. FMC is forming a startup company based on TVA's ALTPC technology. The royalty to TVA from this license agreement is based on installed generation. TVA will continue to have access to ALTPC technology;
- Continued a joint EPRI and TVA project, the Carbon Capture and Water Emissions Treatment System (CCWESTRS), which is demonstrating integration of fossil power plant operations with terrestrial carbon sequestration technologies to treat ash pond water in site soils;
- Completed installation and initiated operation of a joint TVA, EPRI, AEP and Duke Energy project, Aquatic Toxicity Improvement and Control, which will demonstrate the use of passive treatment of high-volume power plant process water for heavy metals and nutrients;
- Initiated demonstration of an innovative biocide for Zebra mussel and micro-fouling control at a fossil plant;
- Evaluating and demonstrating Demand Side Management (DSM) initiatives to prepare for future changes in the energy market place. Demonstrations underway include:
  - Net-Zero Energy House Community - TVA is continuing to work with Oak Ridge National Lab (ORNL) and is having discussions with developers that are interested in building very high efficiency "green" developments. A demonstration was started this year to test and verify energy efficiency technologies. Three test houses are under construction and groundbreaking has taken place for four more houses. All seven will be heavily monitored and operated with simulated occupancy to quantify the energy performance of a variety of the different technologies being tested.
  - A GridPoint Energy Storage System installed in one of the TVA /ORNL/ Habitat Zero Energy Houses, continued to demonstrate Peak Load Reduction. At the end of FY 2008 (September 30, 2008) the GridPoint equipment was turned over to ORNL.

**II. Energy Efficiency Performance.** This section will highlight progress toward the performance metrics compiled and calculated in the Annual Energy Management Data Report. The purpose of the section is to provide narrative information in support of these data as well as showcase particular agency initiatives and projects contributing to the goals of EPACT '05, E.O. 13423, and EISA.

#### **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 AEMC. The AEMC remains the focal point for disseminating energy and related environmental

information to TVA organizations and employees. To benchmark success, the AEMC utilizes many tools including the OMB Energy Scorecard and Internal Energy Management Program Database. The AEMC 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 AEMC uses many tools including:

#### **TVA NEW BUILDING DESIGN**

TVA incorporates sustainable practices and energy efficiency standards into new building designs. These designs consider the incorporation of technologies such as daylighting, passive solar heating, geothermal heat pumps, premium efficiency motors, demand reduction, advanced controls and non-toxic, recycle-content building materials.

#### **TVA FACILITY IMPROVEMENTS**

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

- 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;
- 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;
- Energy Management Control Systems have been added to control heating and cooling systems, lighting systems, motors, exhaust fans, pumps and other energy using equipment;
- Variable Frequency Drives have been added to building heating, ventilating, and air conditioning units;
- New high efficiency heat pump systems have been installed in many buildings to replace old window units and out of date package units;
- Existing air handlers have been rebuilt to improve efficiency;
- Existing chillers have been replaced and/or rebuilt to improve efficiency;
- Old, inefficient cooling towers were updated to a high efficiency system on one facility with a reduction in energy use of 33 percent;
- Old inefficient single glazed windows were replaced with double glazed windows;
- Motorized shades were installed to reduce solar heat gain and cooling loads;
- Renovated buildings had insulation installed in the ceiling and walls where applicable; and
- Older emergency generators were replaced with smaller ones which reduces fuel use and cost.

#### **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 2008:

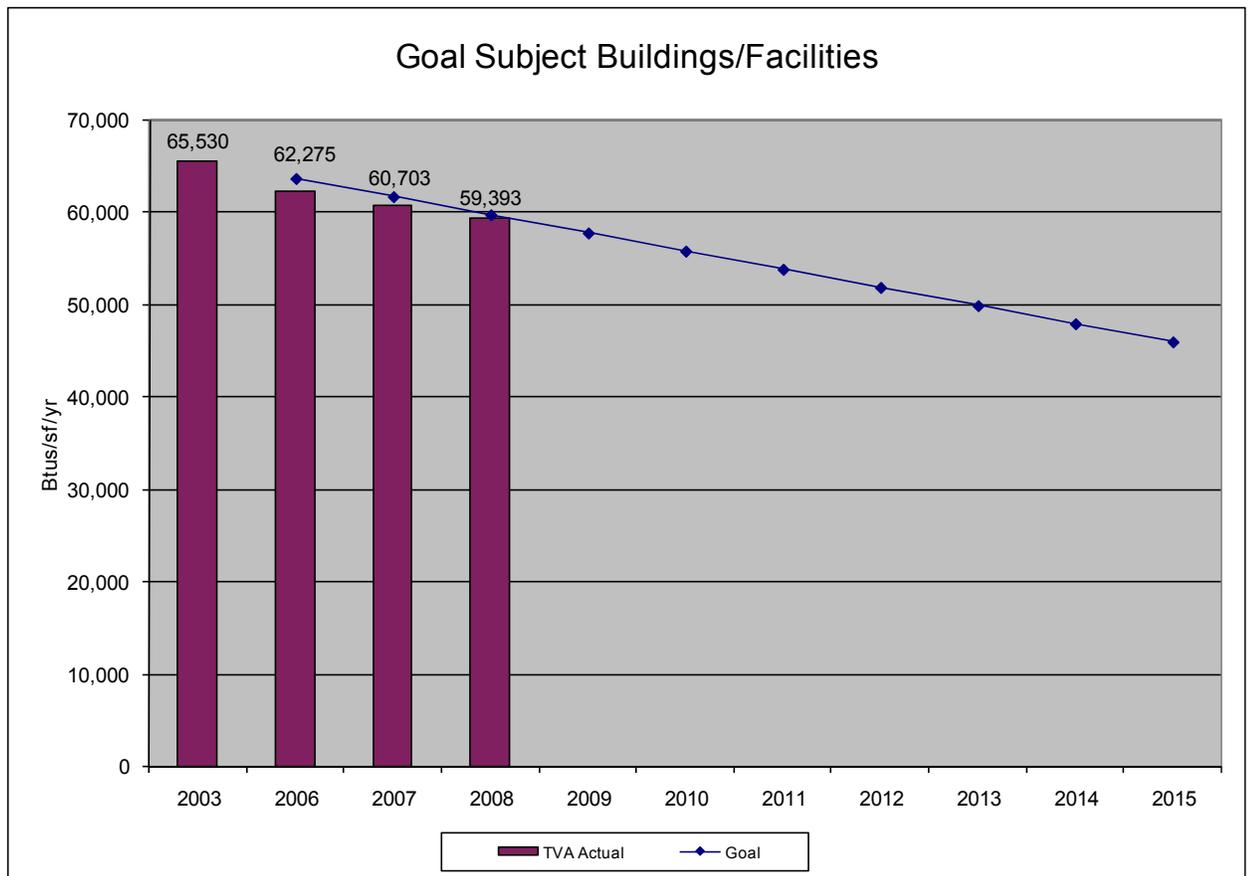
- Recycle scrap metals, used oil, substation and communication station service batteries, and storm damaged or deteriorating steel structures;
- Recycle expired fluorescent lamps;

- **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 relamping;**
- **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 always 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 (recommissioning);**
- **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; and
- Properly insulate hot water and steam lines to reduce energy loss.

1. **Goal Subject Buildings.** Report energy use for buildings in units of Btu-per-gross-square-foot (Btu/GSF) for FY 2003 (the base year) and FY 2008. Report the percent change from FY 2003 and from FY 2008. (Note: This information will be reported on the performance summary spreadsheet incorporated into the Annual Energy Management Data Report). Discuss any extenuating factors that may be skewing the accuracy of this performance measure.

**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 2008 with a Btu/GSF/Yr of 59,393 (including the renewable energy credit); this is a 9.4 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. (Refer to DOE’s *Criteria Guidelines Establishing Criteria for Excluding Buildings from the Energy Performance Requirement*, See: [http://www.eere.energy.gov/femp/pdfs/exclusion\\_criteria.pdf](http://www.eere.energy.gov/femp/pdfs/exclusion_criteria.pdf).) These guidelines fulfill the requirement under Section 543(c)(3) of NECPA as amended by EPACT ’05. Section 543(c)(3) states that the Secretary of Energy shall issue guidelines that establish criteria for exclusions from the energy performance requirement for a fiscal year, any Federal building or collection of Federal buildings, within the statutory framework provided by the law. These guidelines were developed through an interagency working group process under the auspices of the Federal Interagency Energy Management Task Force which subsequently concurred with the final product.

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 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 2008.

The following is a list of projects implemented in FY 2008 or planned for future implementation related to energy/water efficiency and sustainability in these exempt facilities.

#### POWER SYSTEM OPERATION EFFICIENCY

TVA’s staff considers energy efficiency and environmental impacts for each project and activity. The following activities have been completed in FY 2008 or are planned for FY 2009.

- **The Power System Optimization and New State Estimator Projects** continue to improve TVA’s ability to operate the power system confidently with decreased margin as a result of increased wide-area awareness of current state and contingency options.
- **Smaller modular switch houses** which are more energy efficient are being installed for new transmission facilities instead of the old block switch houses of the past.
- **Reactive Power:** The PSO Optimal Power Flow Initiative has been implemented with loss savings of approximately 10MW using an optimized voltage schedule and minimizing new construction of reactive devices through optimal placement. The Northeast section was the first area completed on the TVA system with other areas following closely behind. Projects include the addition of 161kV capacitor banks at Jonesborough switching station and Manchester 161kV substation.
- **Construction of New Transmission Lines (TLs):** New lines help to ensure that electricity can be delivered reliably for the minimum transmission loss. The environmental impact of new lines is minimized through careful design and route selection, study of all possible alternatives including new technologies, and realizing the best performance from existing resources, as well as a detailed process for public involvement. A new 500kV line was constructed from Cumberland to Montgomery. Also new transmission lines were constructed from Kingston to ORNL in Tennessee, Coosa River in Alabama, and at other locations across the TVA region. Projects in progress or planned projects include the Maury-Rutherford 500kV transmission line, Murfreesboro-E. Franklin 161kV transmission line, and Fontana-Santeetlah 161kV rebuild.
- **Construction of new TVA Interconnections:** New interconnections typically allow two area systems to become stronger for minimal capital improvements. No new interconnections

were completed in FY 2008, but expanded interconnections are in progress with Duke and Eastern Kentucky Power Corporation.

- **New TVA Substations/Breakers:** New substations/switching stations increase the reliability of the power system by reducing interruptions to area loads. New breaker installations placed in service during FY 2008 or planned for FY 2009 include replacement of overstressed breakers at Colbert Fossil Plant and Fontana Hydro Plant, and new breakers at Monterey and McCreary. New TVA substations placed in service during FY 2008 include the Coosa River 161kV substation and the Bradley 500kV substation. New substations planned in FY 2009 and beyond include a 500kV substation in Rutherford County, Tennessee. In addition, transformers were replaced or will be replaced at Burnsville and Wilson substations with more efficient transformers, and failed transformers will be replaced at Shelby, Johnsonville Fossil Plant, and Bull Run Fossil Plant.
- **Transmission Line Upgrades:**
  - In FY 2008, line upgrades were completed for the Ocoee #2 - Ocoee #3 69kV TL rebuild along with upgrades for the following TLs: Wheeler-Nance-Trinity 161-kV, Great Falls-Center Hill 161-kV, Kentucky-Calvert #1, 2 161kV and Gallatin-North Nashville 161kV. This allowed for additional transmission capacity in these areas without requiring acquisition of new right-of-ways.
  - Work continues on TL upgrades in FY 2009 with planned projects including Barkley-Hopkinsville, Lost City-Bowling Green, Johnsonville-Dickson, Weakly-Lagoon Creek, and Madison-Farley.
- **Delivery points:** Like new transmission lines, designing a system with sufficient connections to the bulk transmission system enables supply to consumers to be closer to the load center which enhances reliability and minimizes losses. A total of 29 new customer delivery points were placed in service during FY 2008. An additional 29 new customer delivery points are planned for FY 2009 including delivery points at Center Point-Tilton, Coldwater, Garner Lane, Jones Cove, College Street Primary, Parsons and Volkswagen.
- In FY 2008, obsolete or problematic relays were replaced with more efficient solid-state relays at Athens, TN 161kV Switching Station (Fort Loudon Hydro Plant terminal), Shawnee Fossil Plant (DOE terminal), Widows Creek Fossil Plant (Madison 500kV Substation terminal), Roane 500kV Substation (Wilson 500kV Substation terminal), Wilson 500kV Substation (Roane 500kV Substation terminal) and Sequoyah Nuclear Plant (SFC capacitor bank relays). Work continues in FY 2009 on the replacement of obsolete and problematic equipment including breakers, switches and relays.

## **HYDRO EFFICIENCY**

The table below accounts for both completed and on-going projects at TVA hydro plants in FY 2008. 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's hydro modernization is of particular importance in terms of energy management. This initiative, designed to ensure the availability of reliable hydroelectric generation in the future, has improved the facilities' efficiency by an average of approximately five percent since its inception in 1992. When completed around 2016, TVA's modernization program will have increased the hydro system's power output capacity by 10 percent, 526 MWs, without adding a dam.

**HYDRO ENERGY PROJECTS COMPLETED IN FY 2008**

| <b>Plant Name</b> | <b>Project Name</b>                  | <b>Cost (\$000's)</b> |
|-------------------|--------------------------------------|-----------------------|
| Hydro System      | Modernization program                | 8,921                 |
| Hydro System      | Asset preservation/recovery projects | 19,618                |
| Hydro System      | Regulatory/Commitment projects       | 18,632                |
| Hydro System      | Safety/fire protection projects      | 4,516                 |
| Hydro System      | Miscellaneous small capital projects | 3,855                 |
|                   | <b>Total All Projects</b>            | <b>55,542</b>         |

**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 2008, 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 2008**

| <b>Plant Name</b> | <b>Project Name</b>   | <b>Cost (000's)</b> |
|-------------------|---|---------------------|
| Browns Ferry      | Unit 3 Main Generator Rewind. Improves generator efficiency.                    | 18,388              |
| Sequoyah          | “A” Low Pressure Turbine Rotor Upgrade. Improves turbine efficiency.            | 2,126               |
| Sequoyah          | “B” Low Pressure Turbine Rotor Upgrade. Improves turbine efficiency.            | 2,435               |
| Sequoyah          | “C” Low Pressure Turbine Rotor Upgrade. Improves turbine efficiency.            | 1,674               |
| Watts Bar         | Utility Sewage Connection & Retire Existing Sewage Plant. Environmental impact. | 436                 |
| Watts Bar         | “C” Low Pressure Turbine Rotor Upgrade. Improves turbine efficiency.            | 5,503               |
| Watts Bar         | Main Generator Core Torque and Re-Wedge. Improves generator efficiency.         | 3,117               |
|                   | <b>Total All Projects</b>   | <b>33,679</b>       |

**NUCLEAR ENERGY PROJECTS IN PROGRESS IN FY 2008, OR PLANNED FOR FUTURE IMPLEMENTATION**

| <b>Plant Name</b>   | <b>Project Name</b>  | <b>Cost (000's)</b> |
|---------------------|--|---------------------|
| <b>Browns Ferry</b> | <b>Replace all PCB containing electrical devices. Environmental impact.</b>                                    | <b>3,471</b>        |
| <b>Browns Ferry</b> | <b>Increase Unit 2 and 3 electrical output by 110 MWe per Unit.</b>  | <b>306,284</b>      |
| <b>Browns Ferry</b> | <b>Increase Unit 1 electrical output by 110 MWe</b>  | <b>33,200</b>       |
| <b>Brown Ferry</b>  | <b>Replace portions of the U2 Condenser Tube Cleaning System. Improves steam cycle efficiency (heat rate).</b> | <b>3,345</b>        |
| <b>Brown Ferry</b>  | <b>Replace portions of the U3 Condenser Tube Cleaning System. Improves steam cycle efficiency (heat rate).</b> | <b>3,501</b>        |
| <b>Browns Ferry</b> | <b>Replace Unit 3 Control Bay Chillers. Removes ozone depleting refrigerant.</b>                               | <b>13,071</b>       |
| <b>Browns Ferry</b> | <b>Off-Gas Chiller Replacement. Removes ozone depleting refrigerant.</b>                                       | <b>5,525</b>        |
| <b>Browns Ferry</b> | <b>Cooling Tower Reliability Improvement. Improves cooling tower efficiency.</b>                               | <b>50</b>           |
| <b>Browns Ferry</b> | <b>Circulating Cooling Water Diffuser Repair. Environmental impact.</b>  | <b>981</b>          |
| <b>Browns Ferry</b> | <b>2A Low Pressure Turbine Rotor Modification &amp; Blade Replacement. Improves turbine efficiency.</b>        | <b>8,200</b>        |
| <b>Browns Ferry</b> | <b>2B Low Pressure Turbine Rotor Modification &amp; Blade Replacement. Improves turbine efficiency.</b>        | <b>7,700</b>        |
| <b>Browns Ferry</b> | <b>2C Low Pressure Turbine Rotor Modification &amp; Blade Replacement. Improves turbine efficiency.</b>        | <b>8,785</b>        |
| <b>Browns Ferry</b> | <b>3A Low Pressure Turbine Rotor Modification &amp; Blade Replacement. Improves turbine efficiency.</b>        | <b>7,784</b>        |
| <b>Browns Ferry</b> | <b>3B Low Pressure Turbine Rotor Modification &amp; Blade Replacement. Improves turbine efficiency.</b>        | <b>8,040</b>        |
| <b>Browns Ferry</b> | <b>3C Low Pressure Turbine Rotor Modification &amp; Blade Replacement. Improves turbine efficiency.</b>        | <b>8,040</b>        |
| <b>Browns Ferry</b> | <b>Purchase Critical Pump Motor Spares. Improves motor efficiency.</b>   | <b>5,126</b>        |
| <b>Browns Ferry</b> | <b>Unit 1 Circulating Cooling Water Motor Replacement. Improves motor efficiency.</b>                          | <b>4,650</b>        |
| <b>Browns Ferry</b> | <b>Unit 3 Circulating Cooling Water Motor Replacement. Improves motor efficiency.</b>                          | <b>4,950</b>        |

|                     |  |                |
|---------------------|--|----------------|
| <b>Browns Ferry</b> | <b>Residual Heat Removal Motor Replacement. Improves motor efficiency.</b>                                     | <b>6,030</b>   |
| <b>Browns Ferry</b> | <b>Residual Heat Removal Service Water Motor Replacement. Improves motor efficiency.</b>                       | <b>1,680</b>   |
| <b>Browns Ferry</b> | <b>Raw Cooling Water Motor Replacement. Improves motor efficiency.</b>   | <b>1,345</b>   |
| <b>Browns Ferry</b> | <b>Control Rod Drive Motor Replacement. Improves motor efficiency.</b>   | <b>690</b>     |
| <b>Browns Ferry</b> | <b>Containment Spray Motor Replacement. Improves motor efficiency.</b>   | <b>4,020</b>   |
| <b>Sequoyah</b>     | <b>Cooling Tower Lift Pump &amp; Motor Replacement. Improves motor efficiency.</b>                             | <b>1,200</b>   |
| <b>Sequoyah</b>     | <b>Spare Auxiliary Feedwater Pump Motor Replacement. Improves motor efficiency.</b>                            | <b>420</b>     |
| <b>Sequoyah</b>     | <b>Main Generator Rewind. Improves generator efficiency.</b>   | <b>4,000</b>   |
| <b>Sequoyah</b>     | <b>Spare "A" Low Pressure Turbine Rotor Modification &amp; Blade Replacement. Improves turbine efficiency.</b> | <b>3,820</b>   |
| <b>Sequoyah</b>     | <b>Improve Unit 2 heat rate by replacing the Steam Generators</b>  | <b>296,432</b> |
| <b>Sequoyah</b>     | <b>PCB Transformer Replacement/ Retrofill. Environmental impact.</b>   | <b>4,912</b>   |
| <b>Sequoyah</b>     | <b>Rebuild 6 essential raw cooling water pumps. Improves pump efficiency.</b>                                  | <b>5,040</b>   |
| <b>Sequoyah</b>     | <b>Replace 480V Board Room Chiller. Removes ozone depleting refrigerant.</b>                                   | <b>1,714</b>   |
| <b>Sequoyah</b>     | <b>Replacement of Glycol Chillers. Removes ozone depleting refrigerant.</b>                                    | <b>8,135</b>   |
| <b>Watts Bar</b>    | <b>Rebuild 4 essential raw cooling water pumps. Improves pump efficiency.</b>                                  | <b>5,395</b>   |
| <b>Watts Bar</b>    | <b>Replace safety related chillers. Removes ozone depleting refrigerant.</b>                                   | <b>26,776</b>  |
| <b>Watts Bar</b>    | <b>Rewind/Refurbish Condenser Circulating Water Motors. Improves motor efficiency.</b>                         | <b>320</b>     |
| <b>Watts Bar</b>    | <b>A Low Pressure Turbine Rotor Modification &amp; Blade Replacement. Improves turbine efficiency.</b>         | <b>4,501</b>   |
| <b>Watts Bar</b>    | <b>B Low Pressure Turbine Rotor Modification &amp; Blade Replacement. Improves turbine efficiency.</b>         | <b>4,243</b>   |
| <b>Watts Bar</b>    | <b>Convert non-safety related Aux Bldg. General Vent Chillers to non-ozone depleting refrigerants.</b>         | <b>963</b>     |

|           |   |                  |
|-----------|---|------------------|
| Watts Bar | Complete and startup Watts Bar Unit 2 (1200 MWe). Provides additional capacity. | 2,490,000        |
| Watts Bar | Cooling Tower Fill Retirement/ Replacement. Improves cooling tower efficiency.  | 1,500            |
|           | <b>Total All Projects</b>   | <b>3,305,839</b> |

#### FOSSIL EFFICIENCY

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

The industry utility magazine *Electric Light & Power* annually ranks the top 20 generating units by various criteria. In the November/December 2007 edition covering performance for calendar year 2006, Bull Run fossil plant earned honors as the 4<sup>th</sup> most efficient coal-fired power plant. Bull Run has ranked among the nation's top 10 most efficient plants every year since 1996 and the plant has topped the list four times in recent years. The rankings are based on heat rate - a measure of the efficiency with which a plant turns fuel energy into electric energy.

Several fossil plants in the fleet marked achievements in plant performance indicators. Gallatin had the second-lowest Equivalent Forced Outage Rate (EFOR) in the site's history, as did Shawnee Unit 10. Gallatin also had its second-highest generation and Paradise had its fifth-highest. Four fossil plants had EFOR levels of less than 3 percent in FY 2008 - Gallatin, John Sevier, Kingston and Shawnee. During FY 2008, five fossil plants exceeded their all time 'all units in service' run records along with 13 units establishing new individual unit record runs.

Ozone season nitrogen oxide (NO<sub>x</sub>) emissions for FY 2008 were 39,363 tons. This is the lowest level for ozone season emissions since all 59 fossil units have been in service and represents an 82.2 percent reduction from the 1995 ozone season emissions. TVA's environmental efforts are continuing via ongoing and future projects and include the addition of technologies to achieve further reductions in nitrogen oxide emissions; fuel switch changes and the addition of scrubbers to achieve further reductions in SO<sub>2</sub> emissions; and the addition of equipment to mitigate SO<sub>3</sub> and improve opacity.

Many energy management and related environmental projects were completed at TVA Fossil plants during FY 2008. 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 2008:

| Plant   | Project Name                   | Cost (000's) |
|---------|--------------------------------|--------------|
| Colbert | COF--U5 Combustion Improvement | 14,628       |
| Colbert | COF--U5 Replace Air Preheaters | 7,263        |

|                     |   |               |
|---------------------|---|---------------|
| <b>Colbert</b>      | <b>COF--U5 Upgrade Precipitator</b>                         | <b>46,127</b> |
| <b>Cumberland</b>   | <b>CUF--U2 Replace LP Turbine Blades L-0 &amp; Rows 1-2</b> | <b>8,799</b>  |
| <b>Cumberland</b>   | <b>CUF--U2 Replace Row 11 Blades on BFPT 2A</b>             | <b>1,319</b>  |
| <b>Gallatin</b>     | <b>GAF--U1-4 NOX Reduction Project</b>                      | <b>1,402</b>  |
| <b>Johnsonville</b> | <b>JOF--U10 Combustion Controls</b>                         | <b>2,100</b>  |
| <b>Widows Creek</b> | <b>WCF--U5 Replace Main Condenser Tubes</b>                 | <b>977</b>    |
| <b>Widows Creek</b> | <b>WCF--U8 Replace 6A &amp; 6B Feedwater Heaters</b>        | <b>1,093</b>  |
|                     | <b>Total All Projects</b>                                   | <b>83,708</b> |

**FOSSIL PROJECTS ONGOING OR FUTURE PROJECTS:**

| <b>Plant</b>        | <b>Project Name</b>                             | <b>Budget (000's)</b> |
|---------------------|---|-----------------------|
| <b>Allen</b>        | <b>ALF--U2 Retube #8 Feedwater Heater</b>       | <b>1,448</b>          |
| <b>Cumberland</b>   | <b>CUF--Replace Sootblowing Air Compressors</b> | <b>5,989</b>          |
| <b>Cumberland</b>   | <b>CUF--U2 Replace Air Preheater Baskets</b>    | <b>7,167</b>          |
| <b>Paradise</b>     | <b>PAF--U3 Replace 1A &amp; 1B HP Heaters</b>   | <b>6,507</b>          |
| <b>Widows Creek</b> | <b>WCF--U7 Replace LP Turbine</b>               | <b>26,772</b>         |
|                     | <b>Total All Projects</b>                       | <b>47,883</b>         |

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 in the use of this category of fuel use and methods employed to reduce fuel use.

**Vehicle Fleet Consumption**—In the past, GSA’s Agency Report of Motor Vehicle Data (Form SF-82) collected acquisition, fuel consumption, and fuel cost data for motor vehicles directly from vehicle fleet managers. The SF-82 was replaced by the Federal Automotive Statistical Tool (FAST), an internet-based reporting platform. FAST eliminates the need to report fuel consumption data for fleet motor vehicles to FEMP on the Data Report. FAST now collects this data, including alternative fuel consumption data reported under Sections 303 and 308 of EPACT, and this information is forwarded to FEMP for inclusion in the Annual Report to Congress. For more information on FAST, please contact Brad Gustafson of DOE’s Federal Energy Management Program at (202) 586-5865

## **FLEET FUEL EFFICIENCY**

TVA's fleet strategy is to examine current vehicle use and replacement and where feasible, choose replacement vehicles that are the most efficient. TVA, as a major provider of electricity, will continue to make use of alternative fueled vehicles (AFVs), including those that use electric power, and acquire additional vehicles to meet requirements under EPA05 and EISA 2007. TVA has recognized the value of hybrid electric vehicle technology in reducing fuel consumption, increasing versatility, and promoting electric propulsion and has included these vehicles in its fleet. TVA created a hybrid-fleet program in FY 2002 which is a partnership effort between TVA's Energy Management and Fleet Management organizations. In FY 2008, TVA added eight hybrid gas/electric vehicles and 57 AFV's to its fleet bringing the total number of hybrid vehicles to 45 and AFV's to 186. For more information, see the TVA Fleet Strategy, Attachment 4

During FY 2008, TVA gasoline fuel usage under FAST (Federal Automotive Statistical Tool) reporting decreased by .7 percent compared to FY 2007 while diesel fuel use under FAST reporting increased by 4.1 percent compared to FY 2007. For more information see Attachment 1.

## **VEHICLE FUEL EFFICIENCY OUTREACH PROGRAMS**

TVA encourages employees to use mass transit systems, vans for group travel and car pools, when available and feasible. 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 2008 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 technologies increased in FY 2008.

- **Video Conference Rooms** - TVA has 58 video conference rooms throughout the Tennessee Valley service area. Approximately 1,801 video conferences were held in FY 2008, an increase of twenty-two percent from FY 2007, eliminating the need for travel to these meetings.
- **Meeting Place** - This technology offers up to 96 origins of audio conferencing without operator assistance, enabling employees across the service area to conduct business without travel. On average, over 2,636 such meetings were held monthly using this system, an increase of six percent from FY 2007.

## **HEAVY EQUIPMENT**

TVA continued using Fuel Mag 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. Our maintenance facilities are using oil burners to heat their facilities using TVA's generated used oil. Also, the used oil generated by our field mechanics is being recycled by the Holston Company.

TVA has begun to use super high efficiency air filters on Caterpillar equipment as available. The cost is about 15-20% higher but the efficient life 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 2008.

#### ANNUAL MILEAGE

| FY | Miles Driven |            | Percent Increase/(Decrease) |                       |
|----|--------------|------------|-----------------------------|-----------------------|
|    | Sedans       | Trucks*    | Sedans<br>Base Yr. 75       | Trucks*<br>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                   |
| 81 | 14,922,450   | 27,655,000 | 22                          | 7                     |
| 82 | 24,714,480   | 24,878,000 | 4                           | (4)                   |
| 83 | 12,125,848   | 25,122,699 | (1)                         | (3)                   |
| 84 | 11,760,288   | 24,947,558 | (4)                         | (4)                   |
| 85 | 11,958,251   | 21,237,202 | (2)                         | (18)                  |
| 86 | 12,359,000   | 24,954,488 | 1                           | (4)                   |
| 87 | 12,905,706   | 24,064,000 | 6                           | (7)                   |
| 88 | 12,650,124   | 24,008,436 | 3                           | (7)                   |
| 89 | 11,312,417   | 22,599,061 | (7)                         | (13)                  |
| 90 | 15,665,480   | 23,516,512 | 28                          | (9)                   |
| 91 | 19,175,027   | 24,120,233 | 57                          | (7)                   |
| 92 | 23,264,550   | 24,318,622 | 91                          | (6)                   |
| 93 | 25,557,833   | 25,702,300 | 109                         | (1)                   |
| 94 | 29,766,173   | 23,947,797 | 144                         | (8)                   |
| 95 | 30,096,968   | 23,996,720 | 146                         | (8)                   |
| 96 | 28,388,572   | 24,998,289 | 132                         | (4)                   |
| 97 | 20,298,902   | 24,343,292 | 66                          | (6)                   |
| 98 | 7,124,589    | 26,623,769 | (42)                        | 3                     |
| 99 | 7,939,345    | 21,335,796 | (35)                        | (18)                  |
| 00 | 9,723,679    | 27,701,582 | (20)                        | 5                     |
| 01 | 9,290,949    | 25,242,686 | (24)                        | (3)                   |
| 02 | 10,793,620   | 23,520,150 | (12)                        | (9)                   |
| 03 | 11,788,288   | 26,175,474 | (4)                         | 1                     |
| 04 | 10,689,531   | 29,911,323 | (13)                        | 15                    |
| 05 | 9,215,499    | 29,575,499 | (25)                        | 14                    |

|    |            |            |      |    |
|----|------------|------------|------|----|
| 06 | 10,929,610 | 34,110,244 | (11) | 32 |
| 07 | 10,747,173 | 33,997,319 | (12) | 31 |
| 08 | 10,115,925 | 32,345,951 | (17) | 25 |

\*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<br>Base Yr. 75 | Trucks*     |       | Sedans<br>Base Yr. 75       | Trucks* |             |
|    |                       | Base Yr. 79 | 4 x 2 |                             | 4 x 4   | Base Yr. 79 |
| 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           |
| 81 | 19.2                  | 13.2        | 7.9   | 27                          | 14      | (4)         |
| 82 | 22.7                  | 14.2        | 8.5   | 50                          | 22      | 4           |
| 83 | 26.2                  | 16.0        | 9.8   | 74                          | 38      | 20          |
| 84 | 27.5                  | 16.4        | 9.5   | 82                          | 41      | 16          |
| 85 | 26.9                  | 16.1        | 10.2  | 78                          | 39      | 24          |
| 86 | 27.6                  | 18.2        | 10.8  | 83                          | 57      | 32          |
| 87 | 26.6                  | 17.5        | 11.4  | 76                          | 51      | 39          |
| 88 | 24.6                  | 15.3        | 11.0  | 63                          | 32      | 34          |
| 89 | 28.3                  | 15.9        | 13.1  | 87                          | 37      | 60          |
| 90 | 28.4                  | 15.7        | 11.6  | 88                          | 35      | 41          |
| 91 | 29.6                  | 18.2        | 15.7  | 96                          | 57      | 91          |
| 92 | 27.7                  | 21.2        | 12.4  | 84                          | 83      | 52          |
| 93 | 31.9                  | 17.3        | 13.6  | 105                         | 49      | 66          |
| 94 | 29.8                  | 15.5        | 12.9  | 97                          | 34      | 57          |
| 95 | 31.2                  | 14.5        | 13.4  | 107                         | 25      | 63          |
| 96 | 29.1                  | 13.2        | 12.7  | 66                          | 14      | 44          |
| 97 | 28.3                  | 14.2        | 12.7  | 87                          | 22      | 44          |
| 98 | 26.6                  | 15.4        | 14.4  | 76                          | 33      | 76          |
| 99 | 25.4                  | 12.8        | 11.9  | 68                          | 10      | 45          |
| 00 | 26.3                  | 13.7        | 12.8  | 74                          | 18      | 56          |
| 01 | 26.6                  | 13.9        | 13.2  | 76                          | 20      | 61          |
| 02 | 26.0                  | 14.1        | 12.9  | 72                          | 22      | 57          |
| 03 | 27.4                  | 14.0        | 12.7  | 81                          | 21      | 55          |
| 04 | 28.2                  | 15.2        | 13.4  | 87                          | 31      | 63          |
| 05 | 27.3                  | 14.8        | 13.4  | 81                          | 28      | 63          |
| 06 | 28.0                  | 15.3        | 13.7  | 85                          | 32      | 67          |
| 07 | 27.1                  | 16.3        | 14.0  | 79                          | 41      | 71          |
| 08 | 27.3                  | 15.4        | 13.2  | 81                          | 33      | 61          |

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

## PROCUREMENT OF ALTERNATIVE FUELED VEHICLES

As a major supplier of electricity, TVA is particularly interested in supporting the use of electric vehicles (EVs). TVA has incorporated EVs into its fleet operations and supports power distributors and local communities with EV technology demonstrations. TVA also utilizes electric vehicles at its plant sites to reduce fuel consumption and emissions.

TVA currently has the following EVs:

- 7 GEM electric cars; and
- 84 EZGOs electric vehicles.

**B. Renewable Energy:** Discuss agency's policy and efforts to encourage 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. More details on the changes to renewable energy reporting are contained in the *FEMP Renewable Energy Requirement Guidance for EPACT 2005 and Executive Order 13423*, available on FEMP's website:

[http://www1.eere.energy.gov/femp/pdfs/epact05\\_fedrenewenergyguid.pdf](http://www1.eere.energy.gov/femp/pdfs/epact05_fedrenewenergyguid.pdf)

### GREEN POWER SWITCH® (GPS)

TVA and 12 public power companies launched GPS on Earth Day, April 22, 2000. GPS was the first program of its kind 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.

Sixteen TVA-owned solar generating facilities are presently operating in Tennessee, Kentucky, Alabama, Virginia and Mississippi. One commercial scale wind power generation site has been operational since November 2000. TVA will also purchase up to 27 megawatts of wind energy from Invenergy through the end of CY 2024. Invenergy operates the fifteen 1.8 megawatt wind turbines that were added to the existing three wind turbines located on Buffalo Mountain in Anderson County, Tennessee. These Invenergy units became operational in December 2004. GPS also benefits from generation produced from an eight megawatt waste water treatment methane gas project located at TVA's Allen Fossil plant near Memphis, Tennessee.

Under the GPS program, residential customers can purchase green power in blocks of 150 kilowatt hours each, at a cost of \$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 reduction of atmospheric carbon dioxide is equivalent to planting an acre of trees in the Tennessee Valley. As of September 30, 2008, residential customers were purchasing 26,004 blocks and business customers were purchasing 16,626 blocks for a total of 42,630 purchased blocks of green power. For the fiscal year, residential and commercial customers purchased a total of 81,328 MWh of green power. This total includes TVA's purchase of 1,170 MWh for use in its Knoxville Office Complex, Chattanooga Office Complex, and Huntsville office.

As of September 30, 2008, there were 104 TVA power distributors participating in the GPS program throughout the Tennessee Valley. TVA plans to continue expanding the GPS program by offering it to additional power distributors.

## RENEWABLE ENERGY TECHNOLOGY MONITORING

TVA identifies and evaluates emerging renewable energy technologies in support of its strategic needs. The renewable energy program provides information to inform renewable energy policy; monitors advancements in renewables to keep TVA organizations and customers informed on technology issues; and demonstrates and develops the most viable technologies in the areas of bio-energy, wind, solar, and other renewable resources.

There are a number of drivers for renewables at TVA. TVA's Green Power Switch program is currently the primary driver for renewable energy technologies at TVA. In addition, TVA's 2007 Strategic Plan promotes reduction of TVA's environmental footprint, including a reduction in carbon intensity and an increase in renewables generation. The 2008 Renewable and Clean Energy Strategy establishes context around renewable energy options under mandatory and voluntary scenarios. Additionally, TVA complies with the renewable energy requirements of Energy Policy Act of 2005 and Executive Order 13423 which mandate that at least half of the required renewable energy consumed by a federal agency come from new renewable sources (in service after January 1, 1999). TVA continues to assess and evaluate new and advanced renewable technologies. Project plans include working with EPRI, national laboratories and other utilities to evaluate large scale biomass gasification for production of electricity and value-added products from regional biomass and evaluating other advanced renewable energy supply options in wind and solar.

1. **Self-generated renewable energy:** Summarize agency activities and highlight specific recent projects related to energy use from electricity self-generated from renewable sources and renewable energy thermal projects. Also discuss energy generated on Federal or Indian lands, but which may be sold to other parties.

Through TVA's GPS program, TVA utilizes photovoltaics, wind, and methane as part of its mix to provide renewable energy to its customers (for more information see Section II. B. Renewable Energy, Green Power Switch).

2. **Purchased renewable energy.** Summarize agency purchases of renewable energy in the form of RECs or as part of competitive power purchases. 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.

- C. **Water Conservation.** Identify/estimate water consumption and cost by the agency in FY 2008 and outline any agency-specific issues related to collection of water consumption data. (Note: This information will be reported on the Data Report.) Also in this section, highlight activities undertaken to improve water efficiency. For more information, refer to DOE's supplemental guidance document, *Establishing Baseline and Meeting Water Conservation Goals of Executive Order 13423* on the FEMP website:  
[http://www1.eere.energy.gov/femp/pdfs/water\\_guidance.pdf](http://www1.eere.energy.gov/femp/pdfs/water_guidance.pdf).

During FY 2008, energy surveys including water were conducted at multiple TVA sites. TVA consumed 714.9 million gallons of potable water in FY 2008 with an estimated cost of \$2.2 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 274 facilities have been covered, representing over 4.3 million GSF. To date, TVA has implemented the Best Management Practices (BMPs) in more than 11 percent of its gross square footage.**

- D. Metering of Electricity Use.** EPCACT '05, Section 103, requires all Federal agencies to install metering and advanced metering where found to be cost-effective, according to guidelines developed by DOE (refer to: [http://www1.eere.energy.gov/femp/pdfs/adv\\_metering.pdf](http://www1.eere.energy.gov/femp/pdfs/adv_metering.pdf)). Agencies are required to install standard or advanced meters at all Federal buildings to the maximum extent practicable, by October 1, 2012 and were to submit implementation plans to accomplish this in August 2006. Agencies are required to report on their progress as part of their annual input to the DOE Report to Congress. Progress will be measured based on the percentage of appropriate buildings metered and the percentage of agency electricity consumption represented by those buildings. The quantitative information related to this section will be reported on the agency's Data Report in Table 2-4. Starting with FY 2008, agencies will be required to report progress on both buildings with standard meters and buildings with advanced meters as well as the total number of buildings for which separate electric meters are appropriate. Agencies should describe progress made in FY 2008 in meeting the milestones of their metering implementation plans.

**Under TVA's Metering Plan, funding for metering projects, including advanced meter installation, was established starting in FY 2008. Meters were installed in 10 Buildings in FY 2008 at a cost of \$54,000.**

- E. Federal Building Energy Efficiency Standards.** EPCACT '05, Section 109, requires that new Federal buildings be designed to achieve energy consumption levels that are at least 30 percent below the levels established in the ASHRAE Standard or the International Energy Conservation Code, as appropriate, if life-cycle cost-effective. DOE published the Interim Final Rule for new Federal building energy efficiency standards in the Federal Register, Vol. 71, No. 232, December 4, 2006, 70275 (see [http://www1.eere.energy.gov/femp/pdfs/fr\\_notice\\_cfr433\\_434\\_435.pdf](http://www1.eere.energy.gov/femp/pdfs/fr_notice_cfr433_434_435.pdf)). The prevailing private sector standards referenced are ANSI/ASHRAE/IESNA Standard 90.1-2004 for commercial and high-rise multi-family residential buildings and the 2004 Supplement to the IECC for low-rise residential buildings. Both Standard 90.1-2004 and the 2004 IECC are incorporated by reference into the new Federal standards. The new standards may be found in 10 Code of Federal Regulations (CFR) Part 433 for commercial and high-rise multi-family residential buildings and in 10 CFR Part 435 Subpart A for low-rise residential buildings.

The quantitative information related to this section will be reported on the agency's Data Report in Table 2-5. In addition, the statute requires that agencies provide the following in their annual reports:

1. a list of all new Federal buildings owned, operated, or controlled by the Federal agency, for which designs were started since the beginning of FY 2007 (begun since October 1, 2006), and
2. a statement specifying whether the Federal buildings are expected to meet or exceed the Federal building efficiency standards.
3. A template for listing all new Federal building designs initiated since FY 2007 is included as a separate worksheet to the Annual Energy Management Data Report workbook. (Note: Only new buildings which *began the design phase* after the

beginning of FY 2007 need to be listed. Buildings for which construction was completed in FY 2007 and after do not need to be listed if they were designed prior to FY 2007.)

**During FY 2008 TVA designed and built seven buildings meeting the Federal building efficiency standard.**

**III. IMPLEMENTATION HIGHLIGHTS OF FY 2008.** The purpose of this section is to identify and describe results and accomplishments to reduce energy consumption and improve energy efficiency. It is not expected that each agency will have employed every strategy; rather, the strategies identified below are intended to remind agency officials of the existence of these strategies and to encourage their use where practical and life-cycle cost effective. Agencies should provide highlights of the following strategies their energy management programs employed during FY 2008:

- A. Life-Cycle Cost Analysis
- B. Retrofits and Capital Improvement Projects
- C. Use of Performance Contracts
  - o Energy-Savings Performance Contracts (ESPCs)
  - o Utility Energy Services Contracts (UESCs).
- D. Use of ENERGY STAR<sup>®</sup> 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 cooling, heating, and power systems

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

#### **AGENCY ENERGY MANAGEMENT COMMITTEE**

**TVA Agency Energy Management Committee is a forum for sharing of information and success stories on energy efficiency 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 implemented in FY 2007 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, used to 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 are the efficient operation of building EMCS 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 on a continuous basis 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 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 Improvement Projects:**

TVA has evaluated building inventory for potential energy conservation measures. These facilities are being re-evaluated in accordance with EPCAct05, EISA 2007, E.O. 13423 and TVA's Memorandum of Understanding with the EPA. During FY 2008, TVA surveyed 152 facilities located across the valley.

**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 2008, TVA did not utilize these financing mechanisms.

**D. Use of Energy Star® and Other Energy-Efficient Products:**

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 feasible.

**E. Sustainable Building Design and High Performance Buildings:**

During FY 2008 TVA did not design or build any major buildings (those that would use \$40,000/year or more energy use). Buildings that were designed and built were smaller metal warehouses and additions to metal buildings mostly to support TVA's construction of its Watts Bar Unit 2 nuclear plant. Following is a list of buildings and their square footages:

- 1) Watts Bar Unit 2 Hut Building 1 (4,130 sf)
- 2) Watts Bar Unit 2 Hut Building 2 (4,130 sf)
- 3) Watts Bar Unit 2 Hut Building 3 (4,130 sf)
- 4) Watts Bar Unit 2 Hut Building 4 (4,130 sf)
- 5) Watts Bar Receiving Warehouse (2,710 sf)
- 6) Watts Bar Mechanical FAB Shop Addition (2,902 sf)

Cost effective energy-saving and sustainable technologies including those required in the "Guiding Principles for Federal Leadership In High Performance and Sustainable Buildings" were incorporated into the buildings listed above including the use of:

- 1) Passive solar heating with fixed overhangs to reduce summer cooling load (buildings 5 & 6).
- 2) Daylighting with photo sensor controls. (buildings 1-6).

- 3) Energy efficient lighting with occupancy sensor controls (buildings 1-6).
- 4) Increased wall and roof insulation (buildings 1-6).
- 5) Reuse of existing foundations and concrete pads (buildings 1-4).
- 6) Recycled content materials (buildings 1-6).
- 7) Commissioning of lighting control systems (buildings 1-6).

These buildings are estimated to use 30 percent+ less energy than the ASHRAE 90.1 energy code.

TVA is incorporating 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; and
- Upgrade lighting systems using T-5 and T-8 lamps, room and personal work station occupancy sensors, and internet based digital lighting control systems.

All of these efforts are being done as part of an agency sustainable program under TVA's IEMP.

TVA continues to buy materials that have positive environmental qualities and include those that meet RCRA, EPCRA, EISA 2007 and EO 13423 requirements and other recycled content materials. Examples of environmental products purchased include 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.

In December of 2008 TVA submitted a list of buildings subject to the 15% retrofit using the "Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings" along with an implementation strategy.

The baseline square footage for the 15% goal is comprised of owned and leased agency-occupied space that is reported in the agency Annual Report to Congress on Federal Government Energy Management and Conservation Programs. TVA currently has 2,758 buildings (28,166,840 GSF). Of this amount 1,619 (19,100,890 GSF) are facilities leaving 1,135 goal subject buildings (9,066,031 GSF). 15% of the gross square footage of the goal subject buildings (1,359,905 GSF) needs to be retrofitted to meet the sustainable guiding principles by the 2015 date. TVA intends to incorporate the sustainable guiding principles in its larger buildings scheduled for renovation provided it is feasible, practical and cost-effective to do so. Following guidance developed for metering, TVA feels that the best opportunities for applying the guiding principles cost-effectively would be to apply them to larger buildings that use greater than \$40,000/year of energy. Looking at TVA's goal subject building inventory this would result in 32 buildings (4,086,216 sf) that would be potential candidates for application of the sustainable guiding principles.

The TVA Facilities Asset Preservation Plan will be used to identify buildings needing renovation and its schedule will be adopted to establish milestones for implementation of the sustainable guiding principles. Any deficiencies will be identified and corrective measures documented in TVA's "Gap Analysis Plan". The TVA Energy Management Committee 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 under TVA's IEMP.

TVA continues to buy materials that have positive environmental qualities and include those that meet RCRA, EPCRA, EISA 2007 and EO 13423 requirements and other recycled content materials. Examples of environmental products purchased include 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.

- 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 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 2008 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: [http://www.eere.energy.gov/femp/pdfs/exclusion\\_criteria.pdf](http://www.eere.energy.gov/femp/pdfs/exclusion_criteria.pdf).

**Attachments:**

- 1) **Attachment 1 - Annual Energy Management Data Report FY 2008 (electronic file "Attachment\_1\_DataReport\_12-08.xls")**
- 2) **Attachment 2 - Excluded Facility Inventory FY 2008 (electronic file "Attachment\_2\_Excluded\_Facility\_Inventory\_12-08.xls")**
- 3) **Attachment 3 - Reporting Units and Conversion Factors for Federal Energy Management Reporting (electronic file "Attachment\_3\_Conversion\_Factors\_12-08.doc")**
- 4) **Attachment 4 - TVA Fleet Strategy FY 2008 (electronic file "Attachment\_4\_Fleet\_Strategy\_12-08.doc")**

## Attachment 1 - Data Report

### Tennessee Valley Authority FY 2008 Energy Management Performance Summary

#### Goal Performance

| <b>Energy Management Requirement</b>  | FY 2003<br>Btu/GSF | FY 2008<br>Btu/GSF | Percent Change<br>2003 - 2008 | FY 2008 Goal<br>Target |
|---|--------------------|--------------------|-------------------------------|------------------------|
| Reduction in energy intensity in facilities subject to the EPACT and E.O. 13423 goals | 65,530             | 59,393             | -9.4%                         | -9.0%                  |

| <b>Renewable Energy Requirement</b>   | Renewable<br>Electricity Use<br>(MWH) | Total Electricity<br>Use<br>(MWH) | Percentage | FY 2008 Goal<br>Target |
|---|---------------------------------------|-----------------------------------|------------|------------------------|
| Eligible renewable electricity use as a percentage of total electricity use | 28,428.0                              | 523,699.8                         | 5.4%       | 3.0%                   |

| <b>Water Intensity Reduction Goal</b>            | FY 2007<br>Gallon/GSF | FY 2008<br>Gallon/GSF | Percent Change<br>2007 - 2008 | FY 2008 Goal<br>Target |
|--|-----------------------|-----------------------|-------------------------------|------------------------|
| Reduction in potable water consumption intensity | 26                    | 25.4                  | -3.1%                         | -2.0%                  |

| <b>Metering of Electricity Use</b>     | Cumulative #<br>of Buildings<br>Metered | Cumulative % of<br>Electricity<br>Metered | Cumulative % of<br>Appropriate<br>Buildings<br>Metered | FY 2012 Goal<br>Target        |
|--|---|---|--|-------------------------------|
| Standard Electricity Meters in FY 2008 | 15                                      | 100.0%                                    | 49.0%  | 100%                          |
| Advanced Electricity Meters in FY 2008 | 10                                      | 17.0%                                     | 15.7%  | Maximum Extent<br>Practicable |
| Total Electricity Meters in FY 2008    | 25                                      | 117.0%                                    | 64.7%  |                               |

| <b>Federal Building<br/>Energy Efficiency Standards</b>   | Percent of<br>New Building<br>Designs | FY 2007 forward<br>Goal Target |
|---|---------------------------------------|--------------------------------|
| Percent of new building designs started since beginning of FY 2007 that are 30 percent more energy efficient than relevant code, where life-cycle cost effective: | 100%                                  | 100%                           |

#### Investments in Energy and Water Management

| <b>Sources of Investment</b>   | Investment Value<br>(Thou. \$) | Anticipated<br>Annual Savings<br>(Million Btu) |
|--|--------------------------------|--|
| Direct obligations for facility energy efficiency improvements       | \$1,721.0                      | 46,406.0                                       |
| Investment value of ESPC Task/Delivery Orders awarded in fiscal year | \$0.0                          | 0.0  |
| Investment value of UESC Task/Delivery Orders awarded in fiscal year | \$0.0                          | 0.0  |
| Total  | \$1,721.0                      | 46,406.0                                       |

|  | Percentage |
|--|------------|
| Total investment as a percentage of total facility energy costs                | 7.0%       |
| Financed (ESPC/UESC) investment as a percentage of total facility energy costs | 0.0%       |

## FY 2008 ENERGY MANAGEMENT DATA REPORT

Agency: Tennessee Valley Authority  
 Date: 12/30/2008

Prepared by: Stephen L. Brothers Jr.  
 Phone: 423-751-7369

### PART 1: ENERGY/WATER CONSUMPTION AND COST DATA

#### 1-1. NECPA/E.O. 13423 Goal Subject Buildings

| Energy Type  | Consumption Units | Annual Consumption | Annual Cost (Thou. \$) | Unit Cost (\$)      | Site-Delivered Btu (Billion)              | Est. Source Btu (Billion) | Est. GHG Emissions (MTCO <sub>2</sub> e) |
|--|-------------------|--------------------|------------------------|---------------------|---|---------------------------|--|
| Electricity  | MWH               | 155,997.5          | \$7,628.9              | \$0.05 /kWh         | 532.26                                    | 1,848.6                   | 100,970                                  |
| Fuel Oil   | Thou. Gal.        | 13.3               | \$50.0                 | \$3.76 /gallon      | 1.8                                       | 1.8                       | 135                                      |
| Natural Gas  | Thou. Cubic Ft.   | 2,700.2            | \$39.0                 | \$14.45 /Thou Cu Ft | 2.8                                       | 2.8                       | 148                                      |
| LPG/Propane  | Thou. Gal.        | 16.4               | \$3.9                  | \$0.24 /gallon      | 1.6                                       | 1.6                       | 97                                       |
| Coal   | S. Ton            | 0.0                | \$0.0                  | #DIV/0! /S. Ton     | 0.0                                       | 0.0                       | 0  |
| Purch. Steam   | BBtu              | 0.0                | \$0.0                  | #DIV/0! /MMBtu      | 0.0                                       | 0.0                       | 0  |
| Other  | BBtu              | 0.0                | \$0.0                  | #DIV/0! /MMBtu      | 0.0                                       | 0.0                       |  |
| Purch. Renew. Electric.                                      | MWH               | 1,170.0            | \$0.0                  | \$0.00 /kWh         | 4.0                                       |                           |  |
| Purch. Renew. Other  | BBtu              | 0.0                | \$0.0                  | #DIV/0! /MMBtu      | 0.0                                       |                           |  |
| Total Costs:   |                   |                    | \$7,721.8              |                     | Total: 542.4                              | 1,854.8                   | 101,351                                  |
| FY 2008 Goal Subject Buildings Gross Square Feet (Thousands) |                   | 9,066.0            |                        |                     | Btu/GSF: 59,833                           | 204,584                   |  |
| Goal Subject Buildings FY 2003 Baseline (Btu/GSF)            |                   | 65,530             |                        |                     | Btu/GSF w/ RE Purchase Credit: 59,393     |                           |  |
|  |                   |                    |                        |                     | Btu/GSF w/ RE & Source Btu Credit: 59,393 |                           |  |

#### 1-2. NECPA/E.O. 13423 Goal Excluded Facilities (1)

| Energy Type   | Consumption Units | Annual Consumption | Annual Cost (Thou. \$) | Unit Cost (\$)      | Site-Delivered Btu (Billion)              | Est. Source Btu (Billion) | Est. GHG Emissions (MTCO <sub>2</sub> e) |
|---|-------------------|--------------------|------------------------|---------------------|---|---------------------------|--|
| Electricity   | MWH               | 366,532.3          | \$16,841.5             | \$0.05 /kWh         | 1,250.6                                   | 4,343.4                   | 237,240                                  |
| Fuel Oil  | Thou. Gal.        | 0.0                | \$0.0                  | #DIV/0! /gallon     | 0.0                                       | 0.0                       | 0  |
| Natural Gas   | Thou. Cubic Ft.   | 0.0                | \$0.0                  | #DIV/0! /Thou Cu Ft | 0.0                                       | 0.0                       | 0  |
| LPG/Propane   | Thou. Gal.        | 0.0                | \$0.0                  | #DIV/0! /gallon     | 0.0                                       | 0.0                       | 0  |
| Coal  | S. Ton            | 0.0                | \$0.0                  | #DIV/0! /S. Ton     | 0.0                                       | 0.0                       | 0  |
| Purch. Steam  | BBtu              | 0.0                | \$0.0                  | #DIV/0! /MMBtu      | 0.0                                       | 0.0                       | 0  |
| Other   | BBtu              | 0.0                | \$0.0                  | #DIV/0! /MMBtu      | 0.0                                       | 0.0                       |  |
| Purch. Renew. Electric.                                   | MWH               | 0.0                | \$0.0                  | #DIV/0! /kWh        | 0.0                                       |                           |  |
| Purch. Renew. Other                                       | BBtu              | 0.0                | \$0.0                  | #DIV/0! /MMBtu      | 0.0                                       |                           |  |
| Total Costs:  |                   |                    | \$16,841.5             |                     | Total: 1,250.6                            | 4,343.4                   | 237,240                                  |
| FY 2008 Excluded Facilities Gross Square Feet (Thousands) |                   | 19,100.8           |                        |                     | Btu/GSF: 65,474                           | 227,394                   |  |
| Goal Excluded Facilities FY 2003 Baseline (Btu/GSF)       |                   | 65,417             |                        |                     | Btu/GSF w/ RE Purchase Credit: 65,474     |                           |  |
|   |                   |                    |                        |                     | Btu/GSF w/ RE & Source Btu Credit: 65,474 |                           |  |

**1-3. Non-Fleet Vehicles and Other Equipment (Does not include Fleet Vehicle Data Captured by FAST System)**

|                   | Consumption Units | Annual Consumption  | Annual Cost (Thou. \$) | Unit Cost (\$)  | Btu (Billion) | Est. GHG Emissions (MTCO <sub>2</sub> ) |
|-------------------|-------------------|---------------------|------------------------|-----------------|---------------|---|
| Auto Gasoline     | Thou. Gal.        | 0.4                 | \$1.1                  | \$3.20 /gallon  | 0.0           | 3                                       |
| Diesel-Distillate | Thou. Gal.        | 600.2               | \$2,259.4              | \$3.76 /gallon  | 83.3          | 6,090                                   |
| LPG/Propane       | Thou. Gal.        | 0.0                 | \$0.0                  | #DIV/0! /gallon | 0.0           | 0                                       |
| Aviation Gasoline | Thou. Gal.        | 61.4                | \$247.8                | \$4.04 /gallon  | 7.7           | 531                                     |
| Jet Fuel          | Thou. Gal.        | 32.0                | \$135.7                | \$4.24 /gallon  | 4.2           | 295                                     |
| Navy Special      | Thou. Gal.        | 0.0                 | \$0.0                  | #DIV/0! /gallon | 0.0           | 0                                       |
| Other             | BBtu              | 0.0                 | \$0.0                  | #DIV/0! /MMBtu  | 0.0           |   |
|                   |                   | <b>Total Costs:</b> | <b>\$2,643.9</b>       |                 | <b>95.1</b>   | <b>6,918</b>                            |

**Optional 1-3a. Fleet Vehicle Consumption and Costs Captured by the FAST System**

(Input reflects format of Section IV, Part C, Annual Fuel Consumption Report, by Fuel Type of FAST SF 82 - Aggregate Combined Report)

| Description  | Consumption Units | Annual Consumption | Annual Cost (Actual \$) | Btu (Billion) |
|--------------|-------------------|--------------------|-------------------------|---------------|
| Biodiesel    | GEG               | 0.0                | \$0.0                   | 0.0           |
| Diesel       | GEG               | 611,000.0          | \$2,316,069.0           | 76.4          |
| Electric     | GEG               | 0.0                | \$0.0                   | 0.0           |
| E-85         | GEG               | 0.0                | \$0.0                   | 0.0           |
| Gasoline     | GEG               | 2,602,000.0        | \$8,329,207.0           | 325.3         |
| Hydrogen     | GEG               | 0.0                | \$0.0                   | 0.0           |
| M-85         | GEG               | 0.0                | \$0.0                   | 0.0           |
| LPG          | GEG               | 0.0                | \$0.0                   | 0.0           |
| NG           | GEG               | 0.0                | \$0.0                   | 0.0           |
| Other        | GEG               | 0.0                | \$0.0                   | 0.0           |
| <b>TOTAL</b> | <b>GEG</b>        | <b>3,213,000.0</b> | <b>\$10,645,276.0</b>   | <b>401.6</b>  |

**1-4. RENEWABLE ENERGY GENERATED ON FEDERAL OR INDIAN LAND WHERE RECS ARE RETAINED BY THE GOVERNMENT**

(New renewable energy is from projects placed in service after January 1, 1999. Include projects that did not retain RECs if they qualify under the grandfather clause.)

| Renewable energy project types in service during FY 2008, by age and source | Number of Projects | Annual Energy Produced | Energy Produced on Federal or Indian Land and Used at a Federal Facility |
|---|--------------------|------------------------|--|
| Electricity from <i>New Solar</i> projects (MWH)                            | 0                  | 30.0                   | 0.0  |
| Electricity from <i>New Wind</i> projects (MWH)                             | 0                  | 0.0                    | 0.0  |
| Electricity from <i>New Biomass</i> projects (MWH)                          | 0                  | 0.0                    | 0.0  |
| Electricity from <i>New Landfill Gas</i> projects (MWH)                     | 0                  | 0.0                    | 0.0  |
| Electricity from <i>New Geothermal</i> projects (MWH)                       | 0                  | 0.0                    | 0.0  |
| Electricity from <i>New Hydro/Ocean</i> projects (MWH)                      | 0                  | 11,564.0               | 11,564.0   |
| Electricity from <i>Old Solar</i> projects (MWH)                            | 0                  | 0.0                    | 0.0  |
| Electricity from <i>Old Wind</i> projects (MWH)                             | 0                  | 0.0                    | 0.0  |
| Electricity from <i>Old Biomass</i> projects (MWH)                          | 0                  | 0.0                    | 0.0  |
| Electricity from <i>Old Landfill Gas</i> projects (MWH)                     | 0                  | 0.0                    | 0.0  |
| Electricity from <i>Old Geothermal</i> projects (MWH)                       | 0                  | 0.0                    | 0.0  |
| Electricity from <i>Old Hydro/Ocean</i> projects (MWH)                      | 0                  | 4,100.0                | 4,100.0  |
| Natural Gas from <i>New Landfill/Biomass</i> projects (Million Btu)         | 0                  | 0.0                    | 0.0  |
| Renewable Thermal Energy from <i>New</i> projects (Million Btu)             | 0                  | 0.0                    | 0.0  |
| Other <i>New</i> Renewable Energy ( <i>Specify Type</i> ) (Million Btu)     | 0                  | 0.0                    | 0.0  |
| Natural Gas from <i>Old Landfill/Biomass</i> projects (Million Btu)         | 0                  | 0.0                    | 0.0  |
| Renewable Thermal Energy from <i>Old</i> projects (Million Btu)             | 0                  | 0.0                    | 0.0  |
| Other <i>Old</i> Renewable Energy ( <i>Specify Type</i> ) (Million Btu)     | 0                  | 0.0                    | 0.0  |
| <b>Total New Renewable Electricity (MWH)</b>                                | 0                  | 11,594.0               | 11,564.0   |
| <b>Total Old Renewable Electricity (MWH)</b>                                | 0                  | 4,100.0                |  |
| <b>Total New Non-Electric Renewable Energy (Million Btu)</b>                | 0                  | 0.0                    |  |
| <b>Total Old Non-Electric Renewable Energy (Million Btu)</b>                | 0                  | 0.0                    |  |
| <b>Total Renewable Energy Generation (Million Btu)</b>                      | 0                  | 53,547.9               |  |

**1-5. ON-SITE RENEWABLE ENERGY GENERATION WHERE RECS ARE NOT RETAINED BY THE GOVERNMENT**

(This energy is only counted toward the renewable energy goal if the agency has enough new RECs to qualify for the on-site bonus.)

|   | Amount Produced<br>or Used | Amount Qualified<br>for Goal |
|---|----------------------------|------------------------------|
| Renewable energy reported here comes from projects: 1) placed in service <b>after 1/1/1999 (New)</b> ; 2) where RECs have not been retained by the government; 3) where the amount has not been reported elsewhere on this data report; and 4) where the energy or RECs have not been sold to another agency that is counting it toward their renewable energy goal. (MWH)      | 0.0                        | 0.0                          |
| Renewable energy reported here must come from projects: 1) placed in service <b>before 1/1/1999 (Old)</b> ; 2) where RECs have not been retained by the government; 3) where the amount has not been reported elsewhere on this data report; and 4) where the energy or RECs have not been sold to another agency that is counting it toward their renewable energy goal. (MWH) | 0.0                        | 0.0                          |

**1-6. RENEWABLE ENERGY/RENEWABLE ENERGY CERTIFICATE PURCHASES IN FY 2008**

(New renewable energy is from resources developed after January 1, 1999)

| Type of Renewable Energy Purchase (Two rows are provided for each type. Insert additional rows as necessary for purchases of same type for different end-use categories (Goal or Excluded) or purchase terms (Short or Long). Insert rows between each color-coded category.) | Total Amount Purchased (MWH) | Total Amount Purchased (Million Btu) | Annual Cost (Thou. \$) | Portion of Total Purchased from Projects on Federal or Indian Lands | FY 2008 Goal Application<br>Renewable Energy Goal (RE)<br>Energy Efficiency Goal (EE) Credit                                  | Purchase Term (Enter: Short or Long) | End Use Category (Enter: Goal or Excluded) | Total Amount Purchased for Goal Buildings (Billion Btu) | Total Amount Purchased for Excluded Fac. (Billion Btu) |
|---|------------------------------|--------------------------------------|------------------------|---|---|--------------------------------------|--|---|--|
| Electricity from <i>New</i> Renewable Source  | 1,170.0                      |                                      | \$0.0                  | 0.0   | RE: 100%<br>EE-Credit: Up to 5.4% reduction for short-term and 7.2% reduction for long-term.                                  | Short                                | Goal                                       | 4.0   | 0.0  |
| Electricity from <i>New</i> Renewable Source  | 0.0                          |                                      | \$0.0                  | 0.0   | RE: 100%<br>EE-Credit: Up to 5.4% reduction for short-term and 7.2% reduction for long-term.                                  | Long                                 | Excluded                                   | 0.0   | 0.0  |
| Electricity from <i>Old</i> Renewable Source  | 0.0                          |                                      | \$0.0                  | 0.0   | RE: Up to 1.5% of total electricity use.<br>EE-Credit: Up to 5.4% reduction for short-term and 7.2% reduction for long-term.  | Short                                | Goal                                       | 0.0   | 0.0  |
| Electricity from <i>Old</i> Renewable Source  | 0.0                          |                                      | \$0.0                  | 0.0   | RE: Up to 1.5% of total electricity use.<br>EE-Credit: Up to 5.4% reduction for short-term and 7.2% reduction for long-term.  | Long                                 | Excluded                                   | 0.0   | 0.0  |
| RECs from <i>New</i> Renewable Source   | 0.0                          |                                      | \$0.0                  | 0.0   | RE: 100%<br>EE-Credit: Up to 5.4% reduction for short-term and 7.2% reduction for long-term.                                  | Short                                | Goal                                       | 0.0   | 0.0  |
| RECs from <i>New</i> Renewable Source   | 0.0                          |                                      | \$0.0                  | 0.0   | RE: 100%<br>EE-Credit: Up to 5.4% reduction for short-term and 7.2% reduction for long-term.                                  | Long                                 | Excluded                                   | 0.0   | 0.0  |
| RECs from <i>Old</i> Renewable Source   | 0.0                          |                                      | \$0.0                  | 0.0   | RE: Up to 1.5% of total electricity use<br>EE-Credit: Up to 5.4% reduction for short-term and 7.2% reduction for long-term.   | Short                                | Goal                                       | 0.0   | 0.0  |
| RECs from <i>Old</i> Renewable Source   | 0.0                          |                                      | \$0.0                  | 0.0   | RE: Up to 1.5% of total electricity use<br>EE-Credit: Up to 5.4% reduction for short-term and 7.2% reduction for long-term.   | Long                                 | Excluded                                   | 0.0   | 0.0  |
| Non-Electric Energy from <i>New</i> Renewable Source  |                              | 0.0                                  | \$0.0                  | 0.0   | RE: no contribution to goal (see comment)<br>EE-Credit: Up to 5.4% reduction for short-term and 7.2% reduction for long-term. | Short                                | Goal                                       | 0.0   | 0.0  |
| Non-Electric Energy from <i>New</i> Renewable Source  |                              | 0.0                                  | \$0.0                  | 0.0   | RE: no contribution to goal (see comment)<br>EE-Credit: Up to 5.4% reduction for short-term and 7.2% reduction for long-term. | Long                                 | Excluded                                   | 0.0   | 0.0  |
| Non-Electric Energy from <i>Old</i> Renewable Source  |                              | 0.0                                  | \$0.0                  | 0.0   | RE: no contribution to goal<br>EE-Credit: Up to 5.4% reduction for short-term and 7.2% reduction for long-term.               | Short                                | Goal                                       | 0.0   | 0.0  |
| Non-Electric Energy from <i>Old</i> Renewable Source  |                              | 0.0                                  | \$0.0                  | 0.0   | RE: no contribution to goal<br>EE-Credit: Up to 5.4% reduction for short-term and 7.2% reduction for long-term.               | Long                                 | Excluded                                   | 0.0   | 0.0  |
| <b>Total Purchases of <i>New</i> Renewable Electricity</b>  | <b>1,170.0</b>               |                                      | <b>\$0.0</b>           | <b>0.0</b>  |   |                                      |  |   |  |
| <b>Total Purchases of <i>New</i> RECs</b>   | <b>0.0</b>                   |                                      | <b>\$0.0</b>           | <b>0.0</b>  |   |                                      |  |   |  |
| <b>Bonus for Purchases from New Projects on Federal or Indian Land</b>  | <b>0.0</b>                   |                                      |                        |   |   |                                      |  |   |  |
| <b>Total Purchases of <i>Old</i> Renewable Electricity</b>  | <b>0.0</b>                   |                                      | <b>\$0.0</b>           | <b>0.0</b>  |   |                                      |  |   |  |
| <b>Total Purchases of <i>Old</i> RECs</b>   | <b>0.0</b>                   |                                      | <b>\$0.0</b>           | <b>0.0</b>  |   |                                      |  |   |  |
| <b>Total Purchases of <i>New</i> Non-Electric Renewable Energy</b>  |                              | <b>0.0</b>                           | <b>\$0.0</b>           |   |   |                                      |  |   |  |
| <b>Total Purchases of <i>Old</i> Non-Electric Renewable Energy</b>  |                              | <b>0.0</b>                           | <b>\$0.0</b>           |   |   |                                      |  |   |  |
| <b>Total Purchases for Goal Buildings</b>   | <b>1,170.0</b>               | <b>0.0</b>                           | <b>\$0.0</b>           |   |   |                                      |  |   |  |
| <b>Total Purchases for Excluded Facilities</b>  | <b>0.0</b>                   | <b>0.0</b>                           | <b>\$0.0</b>           |   |   |                                      |  |   |  |
| <b>Total All Purchases</b>  | <b>1,170.0</b>               | <b>0.0</b>                           | <b>\$0.0</b>           |   |   |                                      |  |   |  |
|   |                              |                                      |                        |   | Eligible Short-Term Purchase<br>Goal Building EE Credit (BBtu):   | 4.0                                  |  |   |  |
|   |                              |                                      |                        |   | Eligible Long-Term Purchase<br>Goal Building EE Credit (BBtu):  | 0.0                                  |  |   |  |
|   |                              |                                      |                        |   | Total Goal Building EE Credit (BBtu):   | 4.0                                  |  |   |  |
|   |                              |                                      |                        |   | Eligible Short-Term Purchase<br>Excluded Fac. EE Credit (BBtu):   | 0.0                                  |  |   |  |
|   |                              |                                      |                        |   | Eligible Long-Term Purchase<br>Excluded Fac. EE Credit (BBtu):  | 0.0                                  |  |   |  |
|   |                              |                                      |                        |   | Total Excluded Fac. EE Credit (BBtu):   | 0.0                                  |  |   |  |

**1-7. GOAL-ELIGIBLE RENEWABLE ELECTRICITY USE AS A PERCENTAGE OF FACILITY ELECTRICITY USE**

(Calculated from input above per FEMP Renewable Energy Guidance)

| Components of Eligible RE Use               | Renewable Electricity Use (MWH) | Total Facility Electricity Use (MWH) | RE as a Percentage of Electricity Use |
|---|---------------------------------|--------------------------------------|---------------------------------------|
| <b>Eligible Renewable Electricity Total</b> | <b>28,428.0</b>                 | <b>523,699.8</b>                     | <b>5.4%</b>                           |
| New Renewable Electricity (without Bonus)   | 12,764.0                        |                                      |                                       |
| Bonus, Federal or Indian Land               | 11,564.0                        |                                      |                                       |
| Eligible Old Renewable Electricity          | 4,100.0                         |                                      |                                       |

**1-8. ALL RENEWABLE ENERGY USE (INCLUDING NON-ELECTRIC) AS A PERCENTAGE OF FACILITY ELECTRICITY USE (WITHOUT BONUS)**

(Calculated from input above for information only)

| All Renewable Energy Use (Billion Btu) | Total Facility Electricity Use (Billion Btu) | RE as a Percentage of Energy Use |
|--|--|----------------------------------|
| 57.5                                   | 1,786.9                                      | 3.2%                             |

**1-9. WATER USE INTENSITY AND COST (2)**

| Potable Water  | Annual Consumption (Million Gallons) | Annual Cost (Thou. \$) | Facility Gross Square Feet (Thou.) | Gallons per Gross Square Foot |
|--|--------------------------------------|------------------------|------------------------------------|-------------------------------|
| Buildings & Facilities Subject to Water Goal                         | 714.9                                | \$2,216.1              | 28,166.8                           | 25.4                          |
|  |                                      |                        |                                    | Percent                       |
| Approx. percentage of reported water consumption that is estimated:  |                                      |                        |                                    | 20%                           |
| Is the FY 2007 agency water intensity baseline preliminary or final? |                                      |                        |                                    | final                         |

A large portion of buildings are master metered

**PART 2: ENERGY EFFICIENCY IMPROVEMENTS**

**2-1. DIRECT AGENCY OBLIGATIONS**

|   | FY 2008       |            | Projected FY 2009 |            |
|---|---------------|------------|-------------------|------------|
|   | (Million Btu) | (Thou. \$) | (Million Btu)     | (Thou. \$) |
| Direct obligations for facility energy efficiency improvements, including facility surveys/audits |               | \$1,721.0  |                   | \$450.0    |
| Estimated annual savings anticipated from obligations   | 46,406.0      | \$798.0    | 3,780.0           | \$65.0     |

**2-2. ENERGY SAVINGS PERFORMANCE CONTRACTS (ESPC) (3)**

|  | Annual savings (Million Btu) | (number/Thou. \$) |
|--|------------------------------|-------------------|
| Number of ESPC Task/Delivery Orders awarded in fiscal year & annual energy (MMBTU) savings.  | 0.0                          | 0                 |
| Investment value of ESPC Task/Delivery Orders awarded in fiscal year.  |                              | \$0.0             |
| Amount privately financed under ESPC Task/Delivery Orders awarded in fiscal year.  |                              | \$0.0             |
| Cumulative guaranteed cost savings of ESPCs awarded in fiscal year relative to the baseline spending.  |                              | \$0.0             |
| Total contract award value of ESPCs awarded in fiscal year (sum of contractor payments for debt repayment, M&V, and other negotiated performance period services). |                              | \$0.0             |
| Total payments made to all ESPC contractors in fiscal year.  |                              | \$0.0             |

**2-3. UTILITY ENERGY SERVICES CONTRACTS (UESC) (4)**

|   | Annual savings<br>(Million Btu) | (number/Thou. \$) |
|---|---------------------------------|-------------------|
| Number of UESC Task/Delivery Orders awarded in fiscal year & annual energy (MMBTU) savings.   | 0.0                             | 0                 |
| Investment value of UESC Task/Delivery Orders awarded in fiscal year.   |                                 | \$0.0             |
| Amount privately financed under UESC Task/Delivery Orders awarded in fiscal year.   |                                 | \$0.0             |
| Cumulative cost savings of UESCs awarded in fiscal year relative to the baseline spending.  |                                 | \$0.0             |
| Total contract award value of UESCs awarded in fiscal year (sum of payments for debt repayment and other negotiated performance period services). |                                 | \$0.0             |
| Total payments made to all UESC contractors in fiscal year.   |                                 | \$0.0             |

**2-4. METERING OF ELECTRICITY USE**

| FY           | Standard Meters                   |                                     | Advanced Meters                   |                                     | Appropriate Buildings                   |                                   |
|--------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|---|-----------------------------------|
|              | Cumulative # of Buildings Metered | Cumulative % of Electricity Metered | Cumulative # of Buildings Metered | Cumulative % of Electricity Metered | # of Appropriate Buildings for Metering | Cumulative % of Buildings Metered |
| 2008         | 15                                | 100.0%                              | 10                                | 17.0%                               | 51                                      | 49.0%                             |
| 2009 planned | 0                                 | 0.0%                                | 8                                 | 15.0%                               | 51                                      | 15.7%                             |

**2-5. FEDERAL BUILDING ENERGY EFFICIENCY STANDARDS**

|  | Number of New Building Designs |
|--|--------------------------------|
| Total new building designs started since beginning of FY 2007:   | 7                              |
| Total new building designs started since beginning of FY 2007 that are expected to be 30 percent more energy efficient than relevant code, where life-cycle cost effective:      | 0                              |
|  | Percent                        |
| Percent of new building designs started since beginning of FY 2007 that are expected to be 30 percent more energy efficient than relevant code, where life-cycle cost effective: | 100%                           |

This only includes buildings which met the TVA capital investment threshold.

**2-6. TRAINING**

|  | (number) | (Thou. \$) |
|--|----------|------------|
| Number of personnel trained in FY 2008/Expenditure | 160      | \$24.0     |

- (1) "1-2. EPACT Goal Excluded Facilities", does not include energy used for the generation or transmission of power.
- (2) Estimated based on normalized actual data.
- (3) TVA considers the use of ESPCs where cost effective and in the best interest of the agency and its customers.
- (4) TVA is a utility.

## Tennessee Valley Authority

### List of New Federal Building Designs and Construction

(Note: Only new buildings which began the design phase after the beginning of FY 2007 need to be listed.

Buildings for which construction was completed in FY 2007 and after do not need to be listed if they were designed prior to FY 2007.)

| New Construction Project Information  |  |                           | Design                 |  |  | Completed New Construction                |   |
|---|--|---------------------------|------------------------|--|--|---|---|
| Project ID  | Building Name                                    | Location<br>(City, State) | Design<br>Started (FY) | Percentage below<br>ANSI/ASHRAE/IESNA<br>Standard 90.1--2004<br>in terms of energy use | If not at least 30% below<br>ANSI/ASHRAE/IESNA<br>Standard 90.1--2004, will design<br>achieve maximum level of energy<br>efficiency that is life-cycle cost-<br>effective? | Date<br>Construction<br>Completed<br>(FY) | In terms of energy use,<br>percentage below<br>ANSI/ASHRAE/IESNA<br>Standard 90.1--2004<br>achieved |
|   |  |                           | 20??                   | 0%   | Yes or No  | 20??                                      | 0%  |
|   | Watts Bar Unit 2 Hut Building 1<br>(4,130 sf)    | Spring City, TN           | 2008                   |  |  | 2008                                      | 30%+  |
|   | Watts Bar Unit 2 Hut Building 2<br>(4,130 sf)    | Spring City, TN           | 2008                   |  |  | 2008                                      | 30%+  |
|   | Watts Bar Unit 2 Hut Building 3<br>(4,130 sf)    | Spring City, TN           | 2008                   |  |  | 2008                                      | 30%+  |
|   | Watts Bar Unit 2 Hut Building 4<br>(4,130 sf)    | Spring City, TN           | 2008                   |  |  | 2008                                      | 30%+  |
|   | Watts Bar Receiving Warehouse<br>(2,710 sf)      | Spring City, TN           | 2008                   |  |  | 2008                                      | 30%+  |
|   | WBN Mechanical FAB Shop<br>Addition (2,902 sf)   | Spring City, TN           | 2008                   |  |  | 2008                                      | 30%+  |
|   | WBN Mechanical Paint Shop<br>Addition (2,514 sf) | Spring City, TN           | 2008                   |  |  | 2008                                      | 30%+  |
|   |  |                           |                        |  |  |   |   |
|   |  |                           |                        |  |  |   |   |
|   |  |                           |                        |  |  |   |   |
|   |  |                           |                        |  |  |   |   |
|   |  |                           |                        |  |  |   |   |
|   |  |                           |                        |  |  |   |   |
| Total new building designs started since beginning of FY 2007:  |  |                           | 7                      |  |  |   |   |
| Total new building designs started since beginning of FY 2007<br>expected to be 30% more energy efficient than relevant code,<br>where life-cycle cost effective: |  |                           | 0                      |  |  |   |   |

# Tennessee Valley Authority

## Designated Covered Facilities for 42 USC 8253(f), Use of Energy and Water Efficiency Measures in Federal Buildings

Note: Power plant building energy use does not include energy used to generate, transmit and control electricity.

| Identification Information        |  | Location Information |       |          | Building Characteristics      |                                      | Energy Manager Information |                      |                       |                   |
|-----------------------------------|--|----------------------|-------|----------|-------------------------------|--------------------------------------|----------------------------|----------------------|-----------------------|-------------------|
| Agency Facility Number (Optional) | Facility Name  | City                 | State | Zip Code | Gross Square Footage (Thous.) | Annual Energy Use (Site Billion Btu) | Unique Identifier          | Last Name (Optional) | First Name (Optional) | E-Mail (Optional) |
| 3645                              | PAF POWER HOUSE (ID: 3645)                             | Drakesboro           | KY    | 42337    | 1,823,203                     | 118.508                              | TVA-CG-Nayad               |                      |                       |                   |
| 3663                              | CUF POWERHOUSE (ID: 3663)                              | Cumberland City      | TN    | 37050    | 1,564,438                     | 101.688                              | TVA-CG-Nayad               |                      |                       |                   |
| 715                               | KIF POWERHOUSE (ID: 715)                               | Kingston             | TN    | 37748    | 1,255,721                     | 92.923                               | TVA-CG-Nayad               |                      |                       |                   |
| 6322                              | JOF POWER HOUSE (ID: 6322)                             | New Johnsonville     | TN    | 37134    | 1,069,704                     | 69.531                               | TVA-CG-Nayad               |                      |                       |                   |
| 274                               | GOT COC - CHATTANOOGA OFFICE COMPLEX (ID: 274)         | Chattanooga          | TN    | 37402    | 1,163,264                     | 65.359                               | TVA-FM-Smith               |                      |                       |                   |
| 712                               | JSF POWERHOUSE (ID: 712)                               | Rogersville          | TN    | 37857    | 836,722                       | 61.917                               | TVA-CG-Nayad               |                      |                       |                   |
| 5799                              | WCF PLANT A POWERHOUSE (ID: 5799)                      | Bridgeport           | AL    | 35772    | 949,877                       | 61.742                               | TVA-CG-Nayad               |                      |                       |                   |
| 6303                              | SHF POWERHOUSE (ID: 6303)                              | West Paducah         | KY    | 42086    | 929,764                       | 60.435                               | TVA-CG-Nayad               |                      |                       |                   |
| 666                               | COF POWERHOUSE (ID: 666)                               | Tuscumbia            | AL    | 35674    | 719,500                       | 53.243                               | TVA-CG-Nayad               |                      |                       |                   |
| 5814                              | WCF PLANT B POWERHOUSE (ID: 5814)                      | Bridgeport           | AL    | 35772    | 804,096                       | 52.266                               | TVA-CG-Nayad               |                      |                       |                   |
| 6101                              | GAF POWER HOUSE (ID: 6101)                             | Gallatin             | TN    | 37066    | 713,267                       | 46.362                               | TVA-CG-Nayad               |                      |                       |                   |
| 311                               | GOT KNOXVILLE OFFICE COMPLEX (ID: 311)                 | Knoxville            | TN    | 37902    | 690,000                       | 45.274                               | TVA-FM-Shank               |                      |                       |                   |
| 268                               | GOT MONTEAGLE PLACE (ID: 268)                          | Chattanooga          | TN    | 37402    | 149,000                       | 35.983                               | TVA-FM-Smith               |                      |                       |                   |
| 6230                              | BRF POWER HOUSE (ID: 6230)                             | Clinton              | TN    | 37716    | 552,034                       | 35.882                               | TVA-CG-Nayad               |                      |                       |                   |
| 3088                              | CUF ABSORBER BUILDING (ID: 3088)                       | Cumberland City      | TN    | 37050    | 107,500                       | 6.988                                | TVA-CG-Nayad               |                      |                       |                   |
| 1042                              | BFN TURBINE BUILDING (ID: 1042)                        | Athens               | AL    | 35611    | 468,442                       | 34.665                               | TVA-CG-Nayad               |                      |                       |                   |
| 641                               | ALF POWERHOUSE (ID: 641)                               | Memphis              | TN    | 38109    | 428,539                       | 27.855                               | TVA-CG-Nayad               |                      |                       |                   |
| 1041                              | BFN REACTOR BUILDING (ID: 1041)                        | Athens               | AL    | 35611    | 361,944                       | 26.784                               | TVA-CG-Nayad               |                      |                       |                   |
| 1048                              | BLN TURBINE BLDG (ID: 1048)                            | Hollywood            | AL    | 35752    | 342,090                       | 22.236                               | TVA-CG-Nayad               |                      |                       |                   |
| 810                               | MSL PSS PSC 127 SHOP 1 MATERIAL DISTRIBUTION (ID: 810) | Muscle Shoals        | AL    | 35661    | 209,218                       | 21.741                               | TVA-FM-Britt               |                      |                       |                   |
| 1056                              | SQN TURBINE BLDG. (ID: 1056)                           | Soddy Daisy          | TN    | 37379    | 325,542                       | 21.160                               | TVA-CG-Nayad               |                      |                       |                   |
| 3067                              | RAC RPS POWERPLANT CHAMBER AND TUNNELS (ID: 3067)      | Tiftonia             | TN    | 37419    | 244,200                       | 18.071                               | TVA-CG-Nayad               |                      |                       |                   |
| 799                               | WEH POWERHOUSE/DAM (ID: 799)                           | Town Creek           | AL    | 35672    | 200,200                       | 14.815                               | TVA-CG-Nayad               |                      |                       |                   |
| 1049                              | SQN AUX.BLDG (ID: 1049)                                | Soddy Daisy          | TN    | 37379    | 217,500                       | 14.138                               | TVA-CG-Nayad               |                      |                       |                   |
| 2999                              | WBN AUXILLARY BUILDING AUX (ID: 2999)                  | Spring City          | TN    | 37381    | 217,500                       | 14.138                               | TVA-CG-Nayad               |                      |                       |                   |
| 1045                              | BLN AUXILIARY BLDG (ID: 1045)                          | Hollywood            | AL    | 35752    | 205,000                       | 13.325                               | TVA-CG-Nayad               |                      |                       |                   |
| 753                               | PKH POWERHOUSE/DAM (ID: 753)                           | Counce               | TN    | 38365    | 177,200                       | 13.113                               | TVA-CG-Nayad               |                      |                       |                   |
| 1249                              | CHC CHATTANOOGA PSCC (ID: 1249)                        | Chattanooga          | TN    | 37401    | 40,574                        | 11.523                               | TVA-FM-Smith               |                      |                       |                   |
| 758                               | SHF AFBC BOILER BLDG (ID: 758)                         | West Paducah         | KY    | 42086    | 120,000                       | 8.880                                | TVA-CG-Nayad               |                      |                       |                   |
| 677                               | FNH POWERHOUSE/DAM (ID: 677)                           | Fontana Village      | NC    | 28733    | 118,414                       | 8.763                                | TVA-CG-Nayad               |                      |                       |                   |
| 1116                              | SQN TRAINING CENTER (ID: 1116)                         | Soddy Daisy          | TN    | 37379    | 119,248                       | 8.718                                | TVA-CG-Nayad               |                      |                       |                   |
| 3001                              | WBN TURBINE BUILDING TB (ID: 3001)                     | Spring City          | TN    | 37381    | 112,500                       | 8.325                                | TVA-CG-Nayad               |                      |                       |                   |
| 826                               | CHH CHL/DC/MSC LABORATORY BLDG/POWER STORES (ID: 826)  | Chattanooga          | TN    | 37401    | 56,682                        | 8.219                                | TVA-CG-Nayad               |                      |                       |                   |
| 811                               | MSL PSS PSC 127 SHOP 2 (ID: 811)                       | Muscle Shoals        | AL    | 35661    | 93,696                        | 8.003                                | TVA-FM-Britt               |                      |                       |                   |
| 754                               | CHH POWERHOUSE/DAM (ID: 754)                           | Chattanooga          | TN    | 37406    | 102,200                       | 7.563                                | TVA-CG-Nayad               |                      |                       |                   |

| Identification Information                                       |  | Location Information |       |          | Building Characteristics      |                                      | Energy Manager Information |                      |                       |                   |
|--|--|----------------------|-------|----------|-------------------------------|--------------------------------------|----------------------------|----------------------|-----------------------|-------------------|
| Agency Facility Number (Optional)                                | Facility Name  | City                 | State | Zip Code | Gross Square Footage (Thous.) | Annual Energy Use (Site Billion Btu) | Unique Identifier          | Last Name (Optional) | First Name (Optional) | E-Mail (Optional) |
| 1109   | SQN OFFICE (ID: 1109)                                  | Soddy Daisy          | TN    | 37379    | 124,912                       | 7.495                                | TVA-CG-Nayad               |                      |                       |                   |
| 314  | MSL NATL FERTILIZER AND ENV. RESEARCH CENTER (ID: 314) | Muscle Shoals        | AL    | 35661    | 185,975                       | 6.903                                | TVA-FM-Britt               |                      |                       |                   |
| 3096   | FTL FLH POWERHOUSE/DAM (ID: 3096)                      | Lenoir City          | TN    | 37772    | 92,540                        | 6.848                                | TVA-CG-Nayad               |                      |                       |                   |
| 1248   | CHC CHATTANOOGA PSC (ID: 1248)                         | Chattanooga          | TN    | 37406    | 97,596                        | 6.832                                | TVA-CG-Nayad               |                      |                       |                   |
| 2995   | WBN TRAINING CENTER (ID: 2995)                         | Spring City          | TN    | 37381    | 93,696                        | 6.758                                | TVA-CG-Nayad               |                      |                       |                   |
| 674  | DGH POWERHOUSE/DAM (ID: 674)                           | Dandridge            | TN    | 37725    | 84,700                        | 6.268                                | TVA-CG-Nayad               |                      |                       |                   |
| 1078   | BFN TRAINING (ID: 1078)                                | Athens               | AL    | 35611    | 101,031                       | 6.163                                | TVA-CG-Nayad               |                      |                       |                   |
| 669  | CRH POWERHOUSE/DAM (ID: 669)                           | Jefferson City       | TN    | 37861    | 83,100                        | 6.149                                | TVA-CG-Nayad               |                      |                       |                   |
| 1067   | BFN MATERIALS (ID: 1067)                               | Athens               | AL    | 35611    | 97,993                        | 6.003                                | TVA-CG-Nayad               |                      |                       |                   |
| 694  | GUH POWERHOUSE/DAM (ID: 694)                           | Guntersville         | AL    | 35976    | 80,747                        | 5.975                                | TVA-CG-Nayad               |                      |                       |                   |
| 276  | MSL CHEMICAL ENGINEERING BUILDING (ID: 276)            | Muscle Shoals        | AL    | 35661    | 87,431                        | 5.558                                | TVA-FM-Britt               |                      |                       |                   |
| 738  | NOH POWERHOUSE/DAM (ID: 738)                           | Norris               | TN    | 37828    | 73,900                        | 5.469                                | TVA-CG-Nayad               |                      |                       |                   |
| 783  | WBH POWERHOUSE/DAM (ID: 783)                           | Spring City          | TN    | 37381    | 68,970                        | 5.104                                | TVA-CG-Nayad               |                      |                       |                   |
| 308  | GOT EDNEY BUILDING (ID: 308)                           | Chattanooga          | TN    | 37402    | 91,842                        | 5.005                                | TVA-FM-Smith               |                      |                       |                   |
| 7329   | BFN NEW ADMIN BUILDING (ID: 7329)                      | Athens               | AL    | 35611    | 84,168                        | 4.913                                | TVA-CG-Nayad               |                      |                       |                   |
| 736  | NJH POWERHOUSE/DAM (ID: 736)                           | New Hope             | TN    | 37340    | 63,900                        | 4.729                                | TVA-CG-Nayad               |                      |                       |                   |
| 1047   | BLN REACTOR BLDG (ID: 1047)                            | Hollywood            | AL    | 35752    | 72,000                        | 4.680                                | TVA-CG-Nayad               |                      |                       |                   |
| 496  | N ENGINEERING LAB BLDG N (ID: 496)                     | Norris               | TN    | 37828    | 20,710                        | 4.607                                | TVA-FM-Shank               |                      |                       |                   |
| 1092   | BLN OFFICE & SERVICE BUILDING (ID: 1092)               | Hollywood            | AL    | 35752    | 64,242                        | 4.561                                | TVA-CG-Nayad               |                      |                       |                   |
| 494  | N ENGINEERING LAB BLDG B (ID: 494)                     | Norris               | TN    | 37828    | 21,059                        | 4.416                                | TVA-FM-Shank               |                      |                       |                   |
| 733  | KYH POWERHOUSE/DAM (ID: 733)                           | Gilbertsville        | KY    | 42044    | 67,400                        | 4.381                                | TVA-CG-Nayad               |                      |                       |                   |
| 812  | MSL PSS PSC 127 SHOP 4 (ID: 812)                       | Muscle Shoals        | AL    | 35661    | 59,278                        | 4.149                                | TVA-CG-Nayad               |                      |                       |                   |
| 3650   | CUF SERVICE BUILDING (ID: 3650)                        | Cumberland City      | TN    | 37050    | 60,000                        | 3.900                                | TVA-CG-Nayad               |                      |                       |                   |
| Total Estimated Energy Use for Covered Facilities (Billion Btu): |  |                      |       |          |                               | 1347.0                               |                            |                      |                       |                   |
| Percentage of Total Facility Energy Use:                         |  |                      |       |          |                               | 75.1%                                |                            |                      |                       |                   |

**AGENCY COMPILATION WORKSHEET FOR CREDIT FOR PROJECTS THAT INCREASE SITE ENERGY USE BUT SAVE SOURCE ENERGY**

(See [http://www.eere.energy.gov/femp/pdfs/sec502e\\_%20guidance.pdf](http://www.eere.energy.gov/femp/pdfs/sec502e_%20guidance.pdf))

**EPACT Goal Subject Buildings**

| Name of Project Saving Source Energy in Current Fiscal Year (insert additional rows as necessary) | Annual Site Energy Increase with the Project | Annual Source Energy Saved with the Project | Adjustment to Annual Site Energy |
|---|--|---|----------------------------------|
|   | (Million Btu)                                | (Million Btu)                               | (Million Btu)                    |
| Project No. 1   | 0.0  | 0.0   | 0.0                              |
| Project No. 2   | 0.0  | 0.0   | 0.0                              |
| Project No. 3   | 0.0  | 0.0   | 0.0                              |
| Totals  | 0.0  | 0.0   | 0.0                              |

**EPACT Excluded Facilities**

| Name of Project Saving Source Energy in Current Fiscal Year (insert additional rows as necessary) | Annual Site Energy Increase with the Project | Annual Source Energy Saved with the Project | Adjustment to Annual Site Energy |
|---|--|---|----------------------------------|
|   | (Million Btu)                                | (Million Btu)                               | (Million Btu)                    |
| Project No. 1   | 0.0  | 0.0   | 0.0                              |
| Project No. 2   | 0.0  | 0.0   | 0.0                              |
| Project No. 3   | 0.0  | 0.0   | 0.0                              |
| Totals  | 0.0  | 0.0   | 0.0                              |

## Attachment 2

### TVA Excluded Facility Inventory - FY2008

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 SWITCHHOUSE         | 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    |
| 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                   | Lewsborg      | TN    |
| CBT LINDEN 69 KV SWITCH HOUSE                 | Linden        | TN    |

| Building Name                                   | City             | State |
|---|------------------|-------|
| 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    |
| 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    |

| Building Name                                | City            | State |
|--|-----------------|-------|
| 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    |
| 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    |
| 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    |

| Building Name                               | City          | State |
|---|---------------|-------|
| 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 FABIVS 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    |
| 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    |

| Building Name                                | City             | State |
|--|------------------|-------|
| 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    |
| 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 MIDDLE 69 KV SWITCH HOUSE                | Middle           | 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    |

| Building Name                                 | City            | State |
|---|-----------------|-------|
| 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    |
| 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 SURGOINSVILLE 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    |
| 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    |

| Building Name                                 | City          | State |
|---|---------------|-------|
| 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                               | Shookes 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    |
| 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    |

| Building Name                                 | City            | State |
|---|-----------------|-------|
| 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    |
| 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    |
| 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    |

| Building Name                                 | City          | State |
|---|---------------|-------|
| 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 BALDWIN 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           | Ecu           | 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    |
| 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    |

| <b>Building Name</b>                     | <b>City</b>    | <b>State</b> |
|--|----------------|--------------|
| 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

| <i>Fuel Type</i> | <i>Reporting Units</i> | <i>BTUs per Reporting Unit</i> | <i>Joules per Reporting Unit</i> | <i>GigaJoules (GJ) per Reporting Unit</i> |
|------------------|------------------------|--------------------------------|----------------------------------|---|
| 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                | 1,055.0                                   |
| Other            | Billion Btu (BBtu)     | 1,000,000,000                  | 1,055,000,000,000                | 1,055.0                                   |

#### Vehicles/Equipment

| <i>Fuel Type</i> | <i>Reporting Units</i> | <i>BTUs per Reporting Unit</i> | <i>Joules per Reporting Unit</i> | <i>GigaJoules (GJ) per Reporting Unit</i> |
|------------------|------------------------|--------------------------------|----------------------------------|---|
| 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                | 1,055.0                                   |

#### 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

## **Attachment 4**

# **Tennessee Valley Authority Fleet 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

# Tennessee Valley Authority Fleet Strategy

## Executive Summary

TVA's mission includes generating and transmitting electric power to fulfill the needs of almost eight million users throughout its seven-state service territory, and specifically includes the major objective of selling power at rates as low as feasible. All TVA operations (including but not limited to 29 hydroelectric plants, 11 fossil-fueled plants, three nuclear plants, 83 generators powered by combustion turbines and 17,000 miles of transmission lines and facilities) are independently funded by power sales and by power revenue bonds (which are not obligations of, nor backed by, the United States); TVA receives no appropriated funds. Consistent with its mission requirements and its independent corporate status, TVA intends to comply with E.O. 13423 to the extent feasible. 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's fleet strategy is to examine current vehicle use and replacement and where possible, choose replacement vehicles that are most efficient. TVA, as a major provider of electricity will continue to make use of alternative fueled vehicles (AFVs) including those that use electric power and acquire additional vehicles to meet requirements under the Energy Policy Act of 1992 and 2005 (EPA92/05). TVA has recognized the value of hybrid electric vehicle technology in reducing fuel consumption, increasing versatility and promoting electric propulsion and has included these vehicles in its fleet. TVA created a hybrid-fleet program in FY 2002 which is a partnership effort between TVA's Energy Management and Fleet Management organizations. In FY 2008, TVA added eight hybrid gas/electric vehicles and 57 AFV's to its fleet, bringing the total number of hybrid vehicles to 45 and AFV's to 186.

In FY 2008 TVA reported in its "Federal Agency Annual Report on Energy Management" the following data:

- Annual MPG Sedans – 27.3
- Annual MPG Light Trucks (4x2) – 15.4
- Annual MPG Light Trucks (4x4) – 13.2

### I-1. TVA Petroleum Use

Petroleum use for covered vehicles will continue to be reported in FAST; however, gasoline and diesel fuel usage for FY 2008 and associated cost is listed below. This data includes fuel used by light duty, medium duty and heavy duty vehicles and equipment used on the road and equipment used off the road. The source of this data is the "TVA Energy Management Annual Report for FY 2008."

- Gasoline – 2.602 million gallons. Cost: \$8.33 million
- Diesel Fuel – 1.211 million gallons. Cost: \$4.58 million

To increase MPG for FY 2009, TVA plans to purchase more fuel efficient vehicles where possible, including additional hybrid vehicles. Fuel saving activities will be reported each year in the TVA Energy Management Annual Report.

## **I-2. 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 attend meetings and presentations. TVA vehicles are used primarily outside of metropolitan statistical areas as described in EPAAct92/05. Also, significantly for purposes of EPAAct92/05 Alternative Fueled Vehicle requirements, TVA has no central fueling facilities in metropolitan statistical areas. Further, as coordinated with DOE, TVA vehicles used in maintaining the reliable operation of the power system appear to be within the intent of EPAAct92/05 exemptions such as for emergency or off-road vehicles. Based on these facts, EPAAct92/05 does not impose significant AFV purchase requirements on TVA but, TVA nonetheless does intend to continue to add to its current fleet of AFVs. Annual fleet characteristics for vehicles covered under EPAAct92/05 will be reported in FAST.

## **I-3. TVA Fleet Strategy to Reduce Fuel Use and Increase Efficiency**

TVA's fleet strategy is to replace vehicles with those that are more efficient where practical. To facilitate this effort, TVA has produced several guides accessible to employees as needed, which graphically compare the fuel use and operating costs of various types of vehicles.

TVA will continue to utilize various transportation options related to increasing efficiency including the use of personal vehicles, short term rental cars and assigned vehicles. This information will also be made available to employees to determine the best method of transportation based on trip duration and miles driven.

TVA examines current vehicle use and replacement and, where possible, chooses replacement vehicles that are most efficient. TVA, as a major provider of electricity, will continue to make use of alternative fueled vehicles that use electric power and acquire additional vehicles to meet requirements under EPAAct92/05. TVA recognizes the value of hybrid electric vehicle technology in reducing fuel consumption, increasing versatility and promoting electric propulsion. TVA has added hybrid vehicles to its fleet and will continue to do so.

TVA's Agency Energy Management Committee (AEMC) facilitates compliance with 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 AEMC 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 AEMC provides an avenue for sharing lessons learned and replicating success, including fuel use and increased vehicle efficiency. This committee meets every other month.