Tennessee Valley Authority
Strategic Sustainability Performance Plan
Executive Order 13514
Federal Leadership in Environmental, Energy, and Economic Performance

Prepared by:

June 2, 2010

TABLE OF CONTENTS

Section 1: Agency Policy and Strategy

I. Agency Policy Statement

From our inception, the people of TVA have maintained a proud history of environmental leadership. On May 18, 1933, the President signed the Tennessee Valley Authority (TVA) Act into law to create an Agency that serves the Valley through its Energy, Environment, and Economic Development mission. To this day, TVA remains committed to leading the way in a new era of environmental sustainability. TVA's environmental policy is to provide cleaner, reliable, and affordable energy to support sustainable economic growth in the Tennessee Valley, and to engage in proactive environmental stewardship in a balanced and ecologically sound manner. The TVA pursuits in these areas benefit the well-being of our employees, our customers, the people we serve, and the natural resources we steward.

Over the years since the passing of the TVA Act, TVA has held fast to this vision and a strategy of innovative and integrated resource management solutions. Today TVA employees manage many environmental sustainability programs, including environmental stewardship and compliance, a growing renewable energy portfolio, and a comprehensive economic development program. TVA also has implemented a comprehensive Environmental Management System (EMS) that allows for TVA to maintain and continuously improve on all environmental aspects throughout the organization.

TVA continues to improve our environmental programs in accordance with the guidance set forth in applicable Executive Orders (EOs) and using our EMS to ensure compliance with applicable environmental and energy statutes and regulations. The TVA EMS platform also enhances our ability to integrate sustainability throughout our operations. The EMS platform supports the integration of sustainability metrics into our overall business planning processes.

As one component of our overall sustainability commitment, TVA is pleased to extend our commitment to our mission by integrating the implementation of the goals of EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* into our existing innovative programs and new efforts. Pursuant to the EO, this comprehensive Strategic Sustainability Performance Plan (SSPP) addresses key aspects of our energy, environmental, economic, and social resources and responsibilities in the 21st Century.

As part of this SSPP, TVA has established specific goals. We will measure and report our progress toward each of these goals annually using our existing EMS platform. Our SSPP will be driven not only by the goals set forth in EO 13514, but also by the TVA Strategic Plan, the 2008 TVA Environmental Policy, and the new TVA Integrated Resource Plan and Natural Resource Plan currently under development. These environmental goals will be an integral part of how we do business, and will be tracked along with our other business objectives.

For Fiscal Year (FY) 2011, TVA has identified several areas that demonstrate our commitment to meeting our environmental sustainability targets and goals. By using existing systems, TVA will strive to implement these environmental sustainability projects as well as consider additional environmental sustainability aspects throughout the organization.

The following presents a representative, but not exhaustive, list that highlights our key proposed projects and investments for FY 2011.

- Tracking sustainability metrics for all business plans through the comprehensive TVA EMS.
- Further engaging and empowering employees this year and beyond through the TVA Personal Sustainability Program, launched on Earth Day April 22, 2010.
- Continuing to create a culture around sustainability, including awareness around energy and water consumption, greenhouse gas emissions, pollution prevention, recycling, waste reduction, and composting.
- Launching a Sustainability Innovation system that includes recognition, rewards and a focus on replicable projects.
- Evaluating the Chattanooga Office Complex (COC) energy management system and other building systems in order to prioritize upgrades for holistic efficiencies.
- Launching a comprehensive assessment of historic buildings and structures at the Muscle Shoals Reservation.
- Exploring water reuse through rooftop rainwater collection systems at the COC.
- Continuing to implement the applicable provisions of the Energy Independence and Security Act (EISA) of 2007 in order to uncover additional water-saving projects like low-flow water closets, urinals, showerheads, and low-flow aerators for lavatories and sinks, and energy-saving opportunities.
- Enacting developed plans to eliminate wet ash and gypsum storage in the TVA system and to convert operating coal-fired power plants to dry storage to reduce industrial waste use.
- Studying the standardized Chemical Traffic Control System database at Sequoyah and Browns Ferry Nuclear Plants for potential agency-wide adoption.
- Performing an inventory of all printers in use, including both networked printers and personal printers, to reduce paper use through policy and purchase changes.
- Continuing the feasibility study of wooden pallet reuse and grinding on regional and centralized levels.
- Launching a mechanism to track construction and demolition waste material and debris.
- Increasing the diversion of compostable and organic matter at four TVA cafeterias by diverting the compostable waste by the end of 2014.
- Establishing the baseline of chemical usage in order to ultimately decrease use of chemicals that increase GHG emissions.
- Implementing plans to individually meter data centers aside from overall facility energy usage.

- Completing the implementation of Advanced PC Power Management project across TVA.
- Establishing the Natural Resource Plan (NRP) to guide the implementation of the TVA reservoir lands planning, natural resource management, water resources management, and recreation processes and strategies.
- Identifying opportunities to reduce energy usage through the installation of fewer and more energy efficient lighting throughout the fossil powerhouses.

The TVA budget for meeting the TVA SSPP goals will be based upon non-appropriated dollars; therefore, this plan and all proposed goals and projects hereunder shall be subject to the availability of funding as TVA, in its discretion, deems appropriate and practicable.

Furthermore, this SSPP is intended for the internal management of TVA only and is not intended to, and does not create any right or benefits, substantive or procedural, enforceable at law or equity against TVA or the United States, or their officials, employees, or agents or any other person.

Signed,

Senior Sustainability Officer

Coordinated with the offices of:

- Chief Financial Officer
- Chief Information Officer
- Chief Acquisition Officer
- Senior Real Property Officer
- General Counsel
- (others as appropriate)

II. Sustainability and the Agency Mission

The TVA Mission is to serve the Tennessee Valley through Energy, Environment, and Economic Development. These areas of service have a direct, clear relationship with environmental sustainability, so achieving the EO 13514 goals directly supports the broader TVA Mission.

Sustainability focuses on Environmental, Economic and Social criteria, which are aspects that are already integral to TVA and its mission:

- The TVA Environmental Policy and commitment to cleaner energy correlates exactly with the environmental aspect of sustainability. TVA efforts to manage natural resources responsibly, reduce emissions, explore renewable energy, all while providing affordable and reliable power, are central to this commitment.

- TVA economic development commitment mirrors the economic aspect through goals of increasing capital investment and attracting and retaining good jobs for the people we serve.

- The TVA Mission is supported by our values, all of which reflect sustainability's social aspect: safety, diversity, integrity and respect, honest communication, accountability, teamwork, flexibility, and continuous improvement.

III. Greenhouse Gas Reduction Goals

TVA has established greenhouse gas (GHG) emission reduction targets for Scope 1 (direct) and 2 (indirect) emissions in accordance with EO 13514. The TVA GHG target is a 17% reduction of Scope 1 and 2 emissions from the FY 2008 baseline by FY 2020. This emission reduction will be accomplished through two primary mechanisms: 1) improving the energy efficiency of the TVA Chattanooga and Knoxville Office Complexes and other major buildings, and 2) improving the reliability and efficiency of the TVA hydro-generating portfolio.

TVA has also established GHG reduction targets for Scope 3 (indirect) emissions associated with employee travel, waste disposal, and transmission and distribution losses from purchased electricity as required by EO 13514. The overall reduction target for Scope 3 emissions is 20.7% by FY 2020, compared to a FY 2008 baseline. The target will be achieved primarily through reductions in solid waste disposal, reduced energy usage in TVA buildings, higher fuel efficiency standards for new cars and light trucks, and increased use of employee telecommuting and employee car-pooling.

IV. Plan Implementation

As mentioned previously, TVA will use the existing EMS to implement both high priority environmental sustainability projects and to consider environmental sustainability in all projects implemented at TVA. All the metrics for these projects will be tracked through the EMS.

a. Internal Coordination and Communication

TVA will communicate the objectives and goals of this SSPP, as well as progress toward objectives, to all TVA employees via the TVA internal website, "InsideNet." Additionally, highlights of initiatives and significant progress toward meeting plan goals will be shared via the daily "TVA Today" email updates and monthly newsletter "Inside TVA." TVA's Environmental Performance Business Unit is responsible for compiling information and reporting on progress under this SSPP as well as other aspects of the TVA Environmental Program. This mechanism will allow the continued identification of opportunities to integrate sustainability requirements into existing planning documents. The Environmental Performance Business Unit works closely with the Employee and Stakeholder Environmental Relations and Environmental Sustainability Business Units and the TVA Corporate Communications Staff to ensure coordination and communication of this plan across TVA.

b. Coordination and Dissemination of the Plan to the Field - Communications Committee

In addition to the Internal TVA communications detailed in Section a above, Environmental Program Objectives and Targets (including targets associated with each Goal Performance Area) will be incorporated into facility-level (field-level) business plans, as appropriate, to ensure implementation in the field as well as at Corporate Offices (see Section 2, Part II c implementation Methods for details).

c. Leadership and Accountability

TVA implementation of the Sustainability Plan will be accomplished by the following key staff:

- Anda Ray – TVA Senior Sustainability Officer
- Al Nayadley – TVA Environmental Sustainability Manager
- Joel Haden – TVA SSPP Manager

TVA created the Environmental Sustainability Manager position and staffed the Environmental Sustainability Program to provide leadership and focus for the TVA Environmental Sustainability efforts. The person in this role serves as the TVA-designated "Chief Energy Manager" as required by past EOs and legislation. The Environmental Sustainability Manager is the TVA point of contact with the Office of Management and Budget (OMB) and Council on Environmental Quality (CEQ) on sustainability reporting.

The Environmental Sustainability Program's goal is to reduce the TVA environmental footprint as a Federal Agency. The program achieves this goal by issuing and maintaining the TVA SSPP; directing the TVA internal Environmental Sustainability team; engaging employees on personal sustainability; and implementing actions to improve the TVA internal environmental footprint in collaboration with others.

TVA is chartering a cross-organizational committee, the TVA Environmental and Energy Sustainability Committee, to ensure that the Environmental Sustainability Program can

collaborate effectively to achieve its purpose. Once chartered, the TVA Environmental and Energy Sustainability Committee will replace TVA's existing Agency Energy Management Committee (AEMC). The new committee will serve the role required of an Agency Energy Management Committee by past EOs and legislation, and will include members of TVA's existing AEMC.

Members of the TVA Environmental and Energy Sustainability Committee manage TVA facilities, buildings, vehicles and information technology (IT) assets. They report and communicate about the TVA sustainability goals and accomplishments. Members also serve on subcommittees. There are eight subcommittees.

The Environmental and Energy Sustainability Steering Subcommittee membership includes Environmental Sustainability Program staff, Working Subcommittee leads, Federal Working Group members, and representatives from organizations that are signatories to the SSPP. This subcommittee leads and manages the collaborative, cross-organizational efforts of the Working Subcommittees as TVA updates and achieves the goals in the SSPP. As part of developing and maintaining the SSPP, this subcommittee sets priorities and agrees on projects. It makes presentations internally and externally to promote the TVA Environmental Sustainability Program.

Representatives on seven Working Subcommittees are responsible for achieving the EO goals and related TVA environmental sustainability goals. The Working Subcommittees develop, implement, and oversee planned projects within their own organizations; report implementation progress and results; and update the SSPP annually. Working Subcommittees include:

- Communications and Innovations,
- Electronic Stewardship and Data Centers,
- Greenhouse Gas,
- Green Procurement,
- High-Performance Facilities,
- Pollution Prevention and Waste Elimination, and
- Regional and Local Planning.

Accountability for accomplishing the SSPP will be managed through the TVA Integrated Performance Management (IPM) system. The system is a five-step process designed to improve individual employee performance by providing clear goals, support for learning and development, ongoing coaching and feedback, and periodic performance reviews. The overall goal of the IPM is to promote excellence in business performance and public service through high-performing and fully engaged employees. Through the system, employees clearly see how their individual performance objectives support their Business Unit performance plans, which then support the TVA Critical Success Factors. All employees involved in accomplishing EOs can align their efforts with the TVA Critical Success Factors to continue to reduce the impacts of TVA operations on the environment.

d. Agency Policy and Planning Integration

TVA will seek to incorporate the goals of the SSPP into existing plans and policies. The following describes four major plan and policy documents:

TVA Strategic Plan (May 2007)

The purpose of the TVA Strategic Plan is to set high-level direction to guide TVA. The Strategic Plan establishes the overall direction and framework for decision-making within TVA. Specific actions related to the Strategic Plan are incorporated into the TVA Business and Performance Plans. For implementation activities requiring environmental review, the Business and Performance Plans also provide opportunities for internal and external stakeholder input. The TVA Board of Directors ensure adherence to the strategy direction through the Business and Performance Plans, and by tracking performance against key metrics. The Board of Directors periodically reviews and updates the Strategic Plan.

TVA Environmental Policy (May 2008)

The TVA Environmental Policy objective is to provide cleaner, reliable, and affordable energy; support sustainable economic growth in the Tennessee Valley; and engage in proactive environmental stewardship in a balanced and ecologically sound manner.

This Environmental Policy provides Board-level guiding principles to successfully lead TVA to reduce its environmental footprint while continuing to provide reliable and competitively priced power to the Tennessee Valley. There is a growing recognition of the environmental and economic need for an increased emphasis on actions that support sustainable initiatives to most effectively meet the three dimensions of the TVA mission. Following the release of the TVA Strategic Plan, the Board asked for the development of an integrated environmental policy to outline objectives and critical success factors across the multiple areas of TVA activities. The TVA Environmental Policy has objectives in each of the following six areas: Climate Change Mitigation, Air Quality Improvement, Water Resources Improvement, Waste Minimization, Sustainable Land Use, and Natural Resource Management.

TVA Natural Resource Plan

On June 15, 2009, TVA published a notice of intent (NOI) to prepare an environmental impact statement (EIS) and to conduct a comprehensive study of future energy and environmental stewardship needs in order to develop an Integrated Resource Plan (IRP). Since publishing the NOI, TVA has determined that planning processes for the Environmental Policy goals not closely tied to energy production and use would be better addressed in a separate study – the Natural Resource Plan (NRP) and EIS. These areas include Water Resource Protection and Improvement, Recreation, Sustainable Land Use and Natural Resource Management. The NRP will describe the implementation of TVA reservoir land planning, natural resource management, water resources management, and recreation processes and strategies. The content of this EIS will be consistent with the TVA Environmental Policy and Land Policy, and with the previous Shoreline Management Initiative EIS and Reservoir Operations Study EIS.

TVA Integrated Resource Plan

As described above, TVA has started a comprehensive study of future energy and environmental stewardship needs in order to develop an Integrated Resource Plan. TVA will develop the plan in a way that best meets the goals of the overall TVA Strategic Plan and Environmental Policy while meeting the needs of Tennessee Valley residents over the next 20 years. The results of the study will be presented in the Integrated Resource Plan.

e. Agency Budget Integration

The TVA Business Plan is the fundamental link between the TVA Strategic Plan and its business processes. The implementation of this Business Plan reinforces TVA's commitment to the TVA Mission and stakeholders, and aligns each business unit's key initiatives with the 24 TVA Critical Success Factors. This alignment enables TVA to manage its priorities and resources in order to effectively address customer, financial, operational, and organizational initiatives for each fiscal year.

TVA will establish environmental program objectives and targets for each of the 10 EO 13514 goals as a part of the TVA EMS planning process, and these objectives and goals will be reflected in the annual Business Planning guidance. The guidance will be used by the Strategic Business Units (SBU) for incorporation in SBU and facility-level Business Plans, as appropriate.

EO 13514 projects have been identified and will be monitored manually in FY 2010 and 2011. Projects will be incorporated into the TVA project justification process and entered into the project's accounting system for capturing cost and budget information. The TVA budget for meeting the TVA SSPP goals will be based on non-appropriated dollars; therefore, this plan and all proposed goals and projects hereunder shall be subject to the availability of funding as TVA, in its discretion, deems appropriate and practicable. EO 13514 goals that are identified as part of the TVA routine operations and maintenance activity will be monitored manually by coordinating efforts between senior management and Financial Services. Specific routine tasks will be identified for reporting on a monthly basis.

In FY 2012, the SSPP budget will be derived from the TVA Business Plan and incorporated into the TVA project accounting system. The EO 13514 projects will be flagged in the TVA project accounting system to automate the capture of cost and budget information.

f. Methods for Evaluation of Progress

Objectives and targets for each of the EO 13514 goals have been outlined in this SSPP and will be incorporated into the TVA EMS planning process and in annual Business Plan guidance. As a part of Business Plan development for the upcoming fiscal year, metrics and performance indicators will be established for each goal area and incorporated in applicable SBU and TVA Business Plans. Progress toward achieving the objectives and targets will be tracked using the EMS Performance Monitoring and Reporting process, and will be communicated using existing internal reports. Self assessments and periodic independent internal audits at the facility level and program

audits conducted under the EMS will also be used to evaluate progress toward meeting the EO 13514 goals. Significant deviations from plans and targets will be managed using the Corrective Action Program as required in the EMS. Table 1 below presents the critical planning coordination activities being conducted by the TVA Communications Committee.

Table 1: Critical Planning Coordination - Communications Committee

Originating Report / Plan	Scope 1 & 2 GHG Reduction	Scope 3 GHG Reduction	Develop and Maintain Agency Comprehensive GHG Inventory	High-Performance Sustainable Design / Green Buildings	Regional and Local Planning	Water Use Efficiency and Management	Pollution Prevention and Waste Elimination	Sustainable Acquisition	Electronic Stewardship and Data Centers	Agency Specific Innovation
GPRA Strategic Plan	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Agency Capital Plan	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
A-11 300s	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Annual Energy Data Report	No	No	No	Yes	No	Yes	No	No	No	No
EISA Section 432 Facility Evaluations/Project Reporting	No	No	No	Yes	No	Yes	No	No	No	No
Budget	No	No	No	Yes	Yes	Yes	No	No	No	Yes
Asset Management Plan / 3 Year Timeline	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Circular A-11 Exhibit 53s	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
OMB Scorecards	No	No	No	Yes	No	Yes	Yes	Yes	Yes	No
DOE's Annual Federal Fleet Report to Congress and the President[1]	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Data Center Consolidation Plan	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Environmental Management System	No	No	No	No	No	No	No	No	No	No
Other (reports, policies, plans, etc.)[2]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

[1] EPAct

[2] Sustainable Building Implementation Plans, Sustainable Procurement (also known as Green or Affirmative Procurement, or Green Purchasing), Electronic Stewardship Plans, Chemical Reduction Plans, Pollution Prevention Plans, Compliance Management Plans, etc.

V. Evaluating Return on Investment

TVA considers the economic business case for all new projects and initiatives. Understanding that many projects can increase social and environmental benefits, these costs and benefits will also be analyzed in the future for most projects. There are no mission-specific factors that prevent TVA from implementing sustainability projects.

TVA has also started developing a Return on Investment (ROI) tool to compare the overall economic, environmental, and social costs and benefits of a project. This tool provides an initial rating based on expected project performance. The following summarizes the rating system:

Rating	Description
Green	GREEN indicates a project will provide a high ROI in this category.
Yellow	YELLOW indicates a project will provide average ROI in this category.
Red	RED indicates a project will provide minimal or negative ROI in this category.

In developing these ratings, TVA considers the following factors:

a. Economic Cost and Benefits

TVA considers discounted payback, profitability index, upfront investment needed, and ongoing annual costs. TVA has been quantifying economic ROI for seven decades. Capital projects and other major investments are considered on a 10 to 15 year energy savings return for major investments. Under a regulatory framework, TVA is also subject to the National Environmental Policy Act (NEPA) and other statutes. For sustainability projects, TVA is using the life-cycle analysis (LCA) approach to determine the cost effectiveness of identified projects.

b. Social Costs and Benefits

TVA recognizes social benefits to be the following: employee morale and satisfaction, stakeholder interest or support, brand management, increase in jobs, promotion of a healthy workplace, community impact, and safety and reliability. TVA is evaluating approaches for quantifying and measuring these on a regular basis.

c. Environmental Costs and Benefits

TVA recognize considers environmental benefits to include reduction to Scope 1, 2, and 3 GHG emissions, water usage, and waste. They take into consideration sustainable acquisition, recycling, and other environmental issues. Environmental costs and benefits have largely been driven by regulatory considerations (e.g., NEPA, Clean Air Act) over the years. TVA prioritizes the projects with the greatest benefits to the TVA Mission and Environmental Policy. Moving forward, consideration of environmental cost and benefits will continue to include the TVA Mission and Environmental Policy, regulatory requirements, and goals in the EO and this sustainability plan.

d. Mission-Specific Costs and Benefits

This SSPP is consistent with the TVA Mission "to serve the Valley through Energy, Environment, and Economic Development." Sustainability projects that address Tennessee Valley economic development, environmental, and social responsibility are well within the TVA mission. By integrating the EO 13514 responsibilities into the TVA personal scorecard, TVA can demonstrate both management commitment and personal engagement to sustainability.

e. Operations and Maintenance and Deferred Investments

The existing TVA Facilities Asset Preservation (FAP) Program addresses deferred maintenance needs across TVA. FAP sub-teams, each led by a member of the FAP team, along with Strategic Business Unit (SBU) representatives gather asset information, identify deficiencies, recommend corrective action, implement planned and approved projects, and report status back to the FAP team. Due to the diversity and complexity of facilities, TVA divides the work into the following five focus areas:

1. Building Envelope - (roofs, walls, siding, insulation, doors, windows, caulking, foundations and footings, slabs, damproofing/waterproofing, and fire-proofing)

2. Building Systems - (elevators, plumbing, life safety systems, HVAC, chillers, electrical distribution, lighting, emergency generators, water treatment, and sewer)

3. Architectural Systems - (finishes and furnishings, specialty finishes, walls, floors, ceilings, partitions, and aesthetic / image appearance)

4. Roads, Parking, and Grounds - (roads, parking areas, grounds and landscaping, erosion control, sidewalks, trails, recreation areas, and signs)

5. Coatings and Corrosion Control - (specialized protective coatings for plant and process equipment subjected to harsh environmental conditions, dam safety spillway gates, other hydro structures, and water barriers)

The FAP Program goal is to have all important facility assets in good or better condition, and included in a routine preventive maintenance program with minimum backlog. The FAP Program achieves this goal using an approach that focuses available resources first on facility assets with the greatest need for repair and importance to the TVA Mission. Additionally, this approach focuses resources first on maintenance items in "Failed Condition," and then on those in "Poor Condition" and those in "Fair Condition" with the potential of extending their economic life.

The approach relies on a prioritization method that draws on evaluated or gathered data. This data includes asset importance ratings, observed condition ratings, life-cycle expectations, actual age, environmental conditions, and health and safety and environmental regulations. Assets are sorted first by observed condition and then by importance. Other factors are considered when needed to refine lists. Project lists are coordinated with SBUs, line management, TVA Power Planning staff, and the TVA Strategic Facilities Planning organization to gain concurrence and consensus. Finally, project approvals are made contingent on the availability of annual funding.

TVA calculated ROI for the overall FAP program as it was developed and approved. TVA does not calculate ROI on a year-to-year or individual project basis. Because of the large backlog of deferred maintenance, most repairs/replacements are on assets that are beyond their useful life and must be replaced to continue supporting the TVA Mission.

Through the FAP program, TVA continues to reduce its deferred maintenance backlog. The program, started in the early 2000s, has made excellent progress especially in some areas such as coatings and roofing.

TVA has an active program to reduce building/facility footprint size. Financial imperatives drive this program, which also provides GHG reduction benefits. GHG requirements will have only a minor impact on facilities with large deferred maintenance backlogs. Condition and mission-criticality drive maintenance schedules with environmental and regulatory issues the secondary concerns. FAP budgets are only sufficient to handle failing or very poor condition assets so additional weighting factors have not been necessary.

f. Climate Change Risk and Vulnerability

In November 2009, the Electric Power Research Institute (EPRI) published a report entitled *Potential Impacts of Climate Change on Natural Resources in the Tennessee Valley Authority Region* (the EPRI Report). TVA co-sponsored this report, with the objective of providing preliminary information on climate change impacts across the Tennessee Valley.

Based on the *Fourth Assessment Report of the Interagency Panel on Climate Change* (the IPCC Report), published in 2007 and subject to substantial uncertainties, EPRI concluded that future precipitation will vary substantially across the Tennessee Valley, with increased precipitation during the winter and unchanged or lower precipitation over the summer. In addition, extreme weather events such as droughts and floods are also expected to become more frequent, although difficult to quantify. The IPPC Report also indicates that temperatures will steadily increase across the Tennessee Valley.

TVA manages the Tennessee River System for multiple purposes, including power generation, water use, commercial navigation, recreation, water quality, and flood control. If realized, projected changes in precipitation and increasing temperatures will directly impact future TVA management of the water resources of the Tennessee Valley.

Power generation is dependent on having sufficient water flow available to generate hydro-power, as well as water temperature for cooling fossil and nuclear power plants. Generation of hydro-power will depend on the precipitation runoff within each reservoir drainage basin and the upstream flow into each reservoir. Increasing water temperatures would require withdrawing more water to achieve the same amount of cooling at fossil and nuclear power plants, or reducing power generation to match the available water supply.

Agricultural, municipal, and industrial water uses are driven by temperature and extreme weather. Warmer temperatures and extreme weather (droughts) will increase water demand for crops, gardens, and landscaping. Industrial process cooling water needs will be impacted by water temperature in the same manner as power generation.

Commercial navigation relies on maintaining the minimum channel depth as well as reasonable flow rates. Increasingly frequent extreme weather events (drought episodes and flooding) may create more challenges to maintaining the entire length of the commercial navigation channel.

Recreational uses of the Tennessee River and its tributaries include boating and fishing, and are dependent on water levels related to precipitation runoff. Sport fishing may also be impacted by water temperature for certain species in certain areas.

Water quality impacts the aquatic life dependent on` the river system. Changes in water flow due to the increasing frequency of extreme weather events may impact the habitats and biodiversity of the Tennessee River system.

As changes in future precipitation and temperature develop, the current river management system employed by TVA (reservoir operating guides) may require periodic re-evaluations to balance the competing water use interests across the Tennessee Valley.

g. Other, as defined by agency – None identified.

VI. Transparency

TVA will communicate to internal and external stakeholders the objectives outlined in this SSPP as well as the measures that will be taken to meet those objectives. This communication will take place in a transparent, easy-to-understand format on the TVA website and in published annual reports. TVA will also communicate anticipated impacts of TVA actions on stakeholders and will include opportunities for stakeholders to participate in programs that improve sustainable performance.

Section 2: Performance Review and Annual Update

I. Summary of Accomplishments

TVA's Mission to serve the Tennessee Valley through Energy, Environment, and Economic Development has already produced many environmental sustainability and social accomplishments. The following summarizes these:

- Although outside the scope of EO 13514 and this SSPP, TVA promotes sustainable practices in the production and use of electrical power. Our current generation portfolio includes wind, solar, and landfill gas-to-energy generation, as well as biomass co-firing and dedicated biomass energy generation. The TVA Green Power Switch® and the GPS Generation Partners® programs leverage this portfolio to promote use and growth of green power.

- TVA is collaborating with a nationally known energy/sustainable company to develop "next generation/dream" energy and water efficiency projects for analysis and study.

- TVA has incorporated many sustainability principles in the Chattanooga and Knoxville Office Complexes during the past year and is currently evaluating these requirements for potential agency-wide adoption.

- The TVA COC, 1.2-million square foot facility completed in 1986, integrates the use of passive energy strategies, energy management practices, environmental programs and activities, and aggressive energy reduction operation and maintenance efforts. This complex remains a model facility within TVA. The U.S. Environmental Protection Agency (EPA) recognized the COC's energy and environmental performance with its Energy Star Building qualification.

- High performance buildings help reduce TVA energy use and costs. As part of the 2007 EISA requirements, TVA started EISA surveys in FY 2009. These surveys resulted in identification of $16.75 million in energy and water improvements with a potential cost savings of $2.15 million/yr with a simple payback of 7.8 years. These cost-effective projects include energy efficient lighting and HVAC upgrades, occupancy sensors to control plug loads, HVAC and lighting controls, insulation and window upgrades, and plumbing fixture retrofits. TVA will continue EISA surveys and implementation to reduce further agency energy and water use.

- TVA ended FY 2009 with an annual average building energy usage rate of 57,283 Btu/GSF (including Green Power Switch renewable energy blocks), which represents a 12.6 percent reduction from the FY 2003 baseline of 65,530 Btu/GSF.

- During FY 2009, TVA conducted energy and water use surveys at multiple sites covering 4.7 million square feet. TVA consumed 711.2 million gallons of potable water in FY 2009 with an estimated cost of $2.7 million. To date, and as required by EISA 2007, TVA has identified projects that can save 13 million gallons of water.

- The TVA Technology Innovations Department is conducting a pilot project to develop internal knowledge and expertise to reduce additional carbon emissions by using a terrestrial carbon sequestration project.

- TVA developed a required, online training program for Technical Contract Managers and Procurement Managers/Agents to support the Green Procurement Plan.

- TVA continues its practice of implementing information technologies such as Video Conference Rooms, Meeting Place, and SharePoint. These practices reduce employee travel, transfer of hard copies, and associated GHG emissions.

- The TVA Information Technology (IT) virtualization in years 2006 through 2009 resulted in a 6 to 1 virtual to physical server ratio in the COC, 11 to 1 in the Browns Ferry Nuclear Facility and 4 to 1 in 11 regional sites. Recent server virtualization is more than 40%, exceeding the EO goal of 30% in FY11.

- The TVA Innovative Environmental Utility Benchmarking Forum, a utility industry benchmarking forum organized and hosted by TVA on May 12 and 13, 2010, allowed utility representatives to share environmental performance data and best practices.

- To achieve goals set in relation to high-performance facilities, TVA utilizes heating and cooling fountains, smaller pumps in heating systems, and membrane heat exchange systems. TVA is currently installing personal work station occupancy sensors to reduce energy use.

- TVA is currently working with Solar America Cities across the Tennessee Valley to make solar energy a more viable option for their communities. Solar America Cities uses innovative approaches to remove market barriers to solar energy and to encourage adoption of solar energy technologies at the local level.

- TVA has a Memorandum of Agreement (MOA) with the Kentucky Energy and Environment Cabinet to help develop clean and renewable energy initiatives. TVA will actively participate in regional and local planning meetings to help facilitate the use of renewable generation.

- In the last decade, TVA has beneficially reused more than 29 million tons of coal combustion products (CCPs). TVA is evaluating a number of market, economic, and regulatory issues that will provide the basis for identifying and setting specific targets for increasing the diversion of these materials.

- TVA currently has a solidly performing waste diversion program at the corporate locations. TVA is increasing awareness of and improving on the program at the remote sites. The remaining amount of waste to be diverted will be generated through new program ideas such as compost bins for food waste generated in office areas and cafes.

- Since 2003, TVA has operated “Growth Readiness,” a program using collaborative planning methods to help communities within its service area create smart growth and low impact policies to support sustainable development. Through this program, 230 communities have evaluated their codes and ordinances against model principles. Initially, evaluations of codes and ordinances against model principles yielded an average score of 39 out of 100, indicating “serious reform needed.” Five years later, 123 of the communities reported changes to achieve more quality growth and scores increasing by 41% to 54.6. In addition, 57 projects used best practices promoted by the program, including pervious pavement, preserved open space, grassy swales, bio-retention and rain gardens.

- The TVA Hydro Modernization Program (HMOD) program began in 1992 to address reliability issues on all 95 units, and increase capacity and efficiency on some portion of the 95 hydro units. As currently configured, the HMOD program is scheduled to be complete in 2030. To date, 57 hydro units have been completed. The capacity gain has been 560 MW and the average efficiency gain has been 4.8 percent.

- The volume of toxic chemicals purchased for use in corporate office buildings has been reduced by more than 90 percent since 1995. The COC is the largest single contributor to this effort.

- For sustainable acquisition, TVA shifted to the use of MAXIMO Asset Management software in 2009. MAXIMO has been customized to allow purchase and tracking of materials/services that are included in the EO 13514 Sustainable Acquisition requirement.

- In the area of information technology, TVA has been using the Energy Star and EPEAT criteria since 2003 and 2005, respectively. Currently, more than 99% of desktops, laptops, and monitors are EPEAT and Energy Star qualified. Ninety-nine percent of all electronic assets are donated, resold, or recycled and thus do not go to a landfill. TVA uses server virtualization to operate 431 servers on 46 physical hosts, a net reduction of 385 servers. Virtualization and smart configuration of data centers reduces energy consumption by the servers as well as the cooling associated with the reduced data centers.

- TVA launched an agency-wide Personal Sustainability initiative on April 22, 2010 in observance of the 40th anniversary of Earth Day. The program engages and empowers employees to weave sustainability into their personal lives in a meaningful way in four key areas: health, efficiency, community, and environment.

II. Goal Performance Review

GOAL 1: Scope 1 and 2 Greenhouse Gas (GHG) Reduction

Scope 1 GHG emissions are from equipment or operations within the TVA organizational boundary that directly emit GHGs. TVA will report Scope 1 GHG emissions in the baseline year, FY 2010, and annually thereafter. Reportable scope 1 and 2 emissions result from the following types of activities: stationary combustion and generation of electricity, heat or steam, (including carbon dioxide (CO_2), methane (CH_4) and nitrous oxides (N_2O) emissions from biomass combusted for production of electricity, heat, cooling, or steam), combustion of fuels in agency-controlled mobile sources, and process operations. Scope 2 GHG emissions are indirect emissions and include those associated with the consumption of purchased or acquired electricity, steam, and heating.

TVA GHG emissions result from a combination of buildings, operations, employee activities, and electric power production. Pursuant to the provisions of EO 13514 and consistent with the EO intent, direct emissions from the production of power and steam sold commercially to other parties in the course of regular business are excluded from the GHG reduction directives.

1.a. Goal Description

TVA has set a Scope 1 and 2 GHG emissions reduction target of 17% from FY 2008 through FY 2020. This emission reduction target is based on a new 5% reduction target from FY 2010 through FY 2015 and a new 4.7% reduction target from FY 2016 through FY 2020 for Excluded Buildings. In addition, this emission reduction target is based on an existing 30% reduction target from FY 2006 through FY 2015 and a new 1% reduction target from FY 2016 through FY 2020 for Goal Subject Buildings.

TVA has also set the following goals as outlined in EO 13514:

Buildings

- Reduce Energy Intensity - TVA will strive to reduce facility energy intensity and resulting GHG emissions by 3% per year from FY 2006 through FY 2015 (total 30% reduction) compared to a baseline year of FY 2003. (Goal is set forth in EO 13514).

- Renewable Electricity Installation and Use - TVA will also strive to increase agency renewable energy installation and use by 3% in FY 2007 through FY 2009, 5% in FY 2010 through FY 2012, and by 7.5% in FY 2013 and beyond. (Goal is set forth in EPAct'05 Sec. 203)

Motor Vehicle Fleet

TVA has a long history of demonstrating stewardship toward energy use reduction and fuel efficiency, and will continue to work toward meeting fuel reduction and vehicle efficiency through pursuing the following fleet targets:

- Reduce petroleum use in fleet vehicles,

- Increase use of alternative fuels in fleet Alternative Fueled Vehicles (AFVs). Optimize use of vehicles and right-size Fleet, and

- Increase use of low emission and high fuel economy vehicles

TVA vehicles are operated across a 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 EPAct92/05. Also, significantly for purposes of EPAct92/05 Alternative Fueled Vehicle requirements, TVA has no central fueling facilities in metropolitan statistical areas. Further, as coordinated with the U.S. Department of Energy (DOE), TVA vehicles used in maintaining the reliable operation of the power system are within the intent of EPAct92/05 exemptions such as for emergency or off-road vehicles. Based on these facts, EPAct92/05 does not require significant AFV purchase requirements for TVA but nonetheless TVA does intend to continue to add to its current fleet of AFVs. Annual fleet characteristics for vehicles covered under EPAct92/05 will be reported in FAST. In place of meeting specific EO goals, TVA will strive to meet such goals and communicate fleet progress through a Fleet Strategy that will be updated as part of the TVA Annual Report on Energy Management.

1.b. Agency Lead for Goal

Implementation of Scope 1 and 2 GHG reductions will be accomplished by the following key groups and individuals:

- TVA Senior Sustainability Officer
- TVA Environmental Sustainability Manager
- TVA Climate Regulatory Policy Team (RPT)

These groups and individuals will be supported by key areas of the TVA organization including the TVA Internal Energy Management Program headed up by the TVA Environmental Sustainability Manager. The Environmental Sustainability Manager will communicate EO goals and legislative requirements and implementation progress toward Scope 1 and 2 GHG reductions through the TVA Environmental and Energy Sustainability Committee and the TVA Climate RPT. The TVA Manager of Sustainable Design and the TVA GHG reporting staff will assist the TVA Environmental Sustainability Manager.

1.c. Implementation Methods

The following describes the implementation methods specific to buildings and fleets that that will be implemented to meet the targets of the Scope 1 and 2 GHG emission reduction goals (Goal 1).

Buildings

TVA plans to reduce facility energy intensity through a number of strategies. EISA requires the completion of comprehensive energy and water evaluations on 25 percent of covered facilities each year. These evaluations will be used to identify energy and potable water reduction projects and strategies necessary to meet the energy intensity and resulting GHG targets. These projects will be funded and implemented through current existing TVA project justification processes and any new sustainability funding initiatives developed within TVA. In addition, all reductions to Scope 1 and 2 GHG emissions will result in progress toward meeting EO 13514 Goals 2, 4, and 6. The TVA facility inventory and the type of activities for which these facilities are used will continue to evolve in the future and facility information will be updated through the TVA Environmental and Energy Sustainability Committee. To benchmark success, this committee uses many tools including the OMB Energy Scorecard and Internal Energy Management Program Database. The TVA Environmental and Energy Sustainability Committee allows representatives to voice problems in meeting regulations and goals and to share success stories which can then be applied throughout 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 day lighting, passive solar heating, geothermal heat pumps, premium efficiency motors, demand reduction, advanced controls and non-toxic, recycle-content building materials.

Facility Improvements

TVA implements various energy efficiency improvements in its facilities and retrofits and upgrades planned under Goal 4. In addition, some examples of new projects include:

- Addition of lighting upgrades including motion sensors, occupancy sensors, electronic ballasts, and new lighting technologies,

- Addition of Energy Management Control Systems to control heating and cooling systems, lighting systems, motors, exhaust fans, pumps, and other energy-using equipment,

- Addition of Variable Frequency Drives to building heating, ventilating, and air-conditioning units,

- Addition of new high-efficiency heat pump systems, air handlers cooling towers, insulation, windows, window shades, and chillers, and

- Replacement of older emergency generators with smaller generators to reduce fuel use and cost.

Operation and Maintenance for Buildings

TVA continues to improve energy efficiency and environmental stewardship through operation and maintenance activities as well as through activities planned under Goal 4. Large reductions in energy usage can be achieved by behavior and procedure modification to ensure that good choices and actions are being taken to minimize energy usage. A list of operation and maintenance practice revisions for FY 2009 has been included as an Appendix to this plan.

Employee Training

TVA provides energy management and associated environmental training to managers and employees as needed. In addition, a dedicated TVA staff tracks energy efficiency and information updates on current federal requirements and regulations. Training is provided to employees, managers, and TVA customers as part of the TVA policy and planning processes. TVA also educates staff on energy- and environmental-related topics through the TVA Training and Development Organization. In FY 2009, TVA provided energy/environmental training to 1,344 employees at an estimated cost of $80,600.

Renewable Electricity

TVA plans to meet the renewable electricity targets through a number of initiatives. TVA will meet the target in part by purchasing Green Power Switch renewable energy blocks totaling approximately 1,170 megawatt-hours (MWh) for the KOC and a number of TVA customer service center buildings. In addition, credits from the TVA Hydro Modernization Program (HMOD) will contribute to meeting the target. TVA also plans to meet the target through on-site renewable technologies that would be installed at TVA facilities as part of the Sustainable High Performance Buildings Goals.

Fleet

The TVA vehicle fleet is not included in the TVA Scope 1 GHG target, but TVA plans to reduce petroleum use in fleet vehicles and increase the use of alternative fuels in the fleet as described below.

Reduce Petroleum Use in Fleet Vehicles

TVA recognizes the value of hybrid electric vehicle technology in reducing fuel consumption, increasing versatility, and promoting electric propulsion. TVA created a hybrid-fleet program in FY 2002 which is a partnership effort between the TVA Energy Management and Fleet Management organizations. In FY 2009, TVA added four hybrid gas/electric vehicles and 27 AFVs to the fleet, bringing the total number of hybrid vehicles to 47 and AFVs to 201. The TVA objective will be to continue adding hybrid and AFVs to the fleet as appropriate.

Increase Use of Alternative Fuels in Fleet AFVs

TVA vehicles are spread across a seven-state service area, and are often required to travel in rural areas outside the major metropolitan areas where alternative fuels are more likely to be available. TVA will continue to purchase alternative fuels for fleet AFVs when and where such fuels are readily available.

Optimize Use of Vehicles and Right-Size Fleet

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

Increase Use of Low Emission and High Fuel Economy Vehicles

The TVA 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 monitors current vehicle use and replacement and, where possible, chooses replacement vehicles that are most efficient.

1.d. Positions

TVA has two full time equivalents (FTEs) spending approximately 50% of their time dedicated to entering utility bill information into the TVA Internal Energy Management Program database, which tracks energy and water usage at the TVA facilities that receive utility bills.

TVA has three FTEs spending approximately 50% of their time dedicated to conducting energy surveys, implementation planning, and reporting. In order to effectively manage and reduce facilities' energy use, TVA estimates that it will need to hire six FTEs to serve as energy managers.

As a power producer, TVA has a number of people with finance, engineering, and policy expertise who are working on renewable power development.

TVA currently has no FTEs tracking the information necessary to assess the target Scope 1 and 2 emission reductions associated with facility improvements, building operations, and maintenance. TVA estimates one FTE will be required for this task.

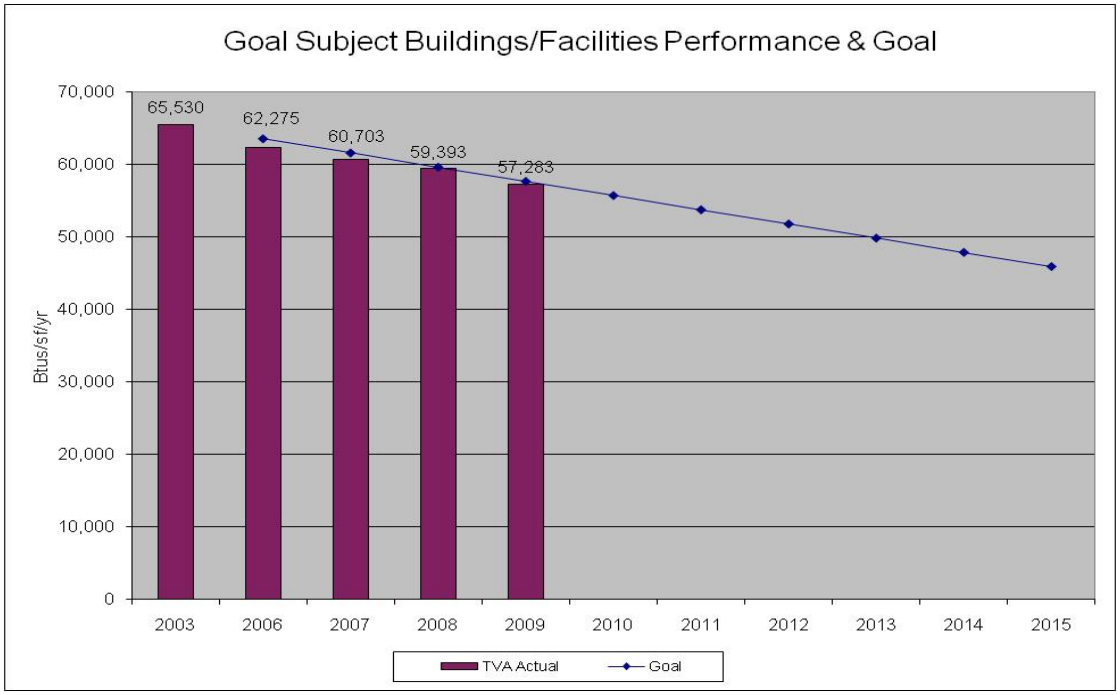
1.e. Planning Table

	SCOPE 1and 2 GHG Target	Unit	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	….	FY 20
Buildings	Energy Intensity Reduction Goals (BTU/SF reduced from FY03 base year)	%	15	18	21	24	27	30	hold	….	hold
	Planned Energy Intensity Reduction (BTU/SF reduced from FY03 base year)	%	15	18	21	24	27	30	30.2	….	31.0
	Renewable Electricity Goals (Percent of electricity from renewable sources)	%	5	5	5	7.5	hold	hold	hold	hold	hold
	Planned Renewable Electricity Use (Percent of electricity from renewable sources)	%	5	5	5	7.5	hold	hold	hold	hold	hold
Fleet	Petroleum Use Reduction Targets (Percent reduction from FY05 base year)	%	10	12	14	16	18	20	22	….	30
	Planned Petroleum Use Reduction (Percent reduction from FY05 base year)	%	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	….	N/A[1]
	Alternative Fuel Use in Fleet AFV Target (Percent increase from FY05 base year)	%	61	77	95	114	136	159	hold	…..	hold
	Planned Alternative Fuel Use in Fleet AFV (Percent increase from FY05 base year)	%	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	….	N/A[1]
	Other, as defined by agency		none	none	None	none	none	none	none	….	none
	Scope 1 and 2 - Reduction Target (reduced from FY08 base year)	%	3.9	5.9	7.8	9.8	11.7	13.7	14.4	….	17.0
	Leveraged Investment (funded through annually recurring existing budget items, such as capital improvement, O&M, etc. or ARRA)	$ M	12.02	11.69	12.72						
	Incremental Investment (funded through new program budget requests specific to this EO)	$ M	0	0.679	0.679						
	Alternative Investment (funded through ESPC, UESC, EUL, PPA, rebates, or other funding assistance)	$ M	NA	NA	NA						

[1] These requirements do not apply to TVA Fleet vehicles (see text discussion)

1.f. Agency Status

TVA continues to reduce energy use in its Goal Subject Buildings through the coordination of energy management efforts and implementation of energy efficiency improvements. TVA ended FY 2009 with a Btu/GSF/Yr of 57,283 (including Green Power Switch renewable energy blocks) which is a 12.6 percent reduction from the FY 2003 baseline year.



For TVA excluded buildings, TVA has a long history of demonstrating stewardship toward energy reduction and will continue to work toward reducing energy use in the generation, transmission, and related energy-intensive buildings. 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. The TVA Internal Energy Management Program is surveying many of these facilities to identify energy reduction opportunities and meet the covered facilities survey requirements under EISA. In FY 2009, 4,705,655 square feet of excluded facilities were surveyed, meeting the 25 percent goal. Energy Conservation Measures (ECM) meeting the Life Cycle and Simple Payback (SPB) criteria were identified and included lighting improvements, controls, water improvements, insulation, and window replacement. The following is a list of projects developed in FY 2009 that meet the existing TVA payback criteria related to energy/water efficiency and sustainability.

Agency Facility Number	FacilityName	Gross Square Footage (Thou.)	Annual EnergyUse (Site Billion Btu)	1. Gross Square Footage Evaluated (Thou.)	2. Estimated Implementation Cost ofMeasure(s) ($)	Annual Data				
						3a. Estimated *Annual* Energy Savings (Million Btu)	Estimated Kwh Savings	Estimated Kw Savings	3b. Estimated *Annual* Water Savings (Thou.Gallons)	3c. Estimated *Annual* Cost Savings ($)
3645	PAF POWERHOUSE	1,823.000	128.85	1,823,000	$ 1,038,450	7,978.7	2,338,428	247	681.0	$ 118,852
3663	CUF POWERHOUSE	1,564.438	115.77	1,564,438	$ 1,216,950	12,519.1	3,669,126	375	0.0	$ 183,456
715	KIF POWERHOUSE	1,229.287	106.624	1,229,287	$ 1,821,527	7,965.2	2,334,477	568	638.2	$ 241,208
694	GUH POWERHOUSE/DAM	88.930	5.086	88,930	$ 235,000	1,742.1	510,565	68	0	$ 23,847
	TOTALS	4,705.655	356.33	4,705,655	$ 4,311,927	30,205.1	8,852,596	1,258	1,319.2	$ 567,363

GOAL 2: Scope 3 Greenhouse Gas Reduction

Scope 3 GHG emissions are a result of TVA activities, but originate from sources outside of TVA's organizational boundary. They include other indirect emissions not accounted for in Scope 2 emissions, and include employee travel, waste disposal, and transmission and distribution (T&D) losses. For FY 2010, TVA will report a selected set of Scope 3 GHG emissions as outlined in the table below. These Scope 3 GHG emissions are the same sources addressed, at a minimum, in the Scope 3 reduction targets.

Scope 3 Emissions Categories for Reporting in FY 2010

Required Scope 3 Emission Categories
Employee business travel (air travel)
Contracted disposal of waste generated in operations (solid waste and wastewater treatment)
Transmission and distribution losses
Optional Scope 3 Emission Categories
Employee business travel (ground travel)
Employee commuter travel

2.a. Goal Description – Scope 3 GHG Reduction

The EO 13514 and guidance from the Office of the Federal Environmental Executive (OFEE) and the Office of Management and Budget (OMB) have established three sub-targets for Scope 3 GHG reductions. TVA will specify reduction targets to meet these sub-targets as summarized in the following table. TVA plans meet these sub-targets by FY 2020 compared to a FY 2008 baseline. A large component of the Scope 3 GHG emissions are from contracted waste disposal activities. Therefore, a significant portion of the reduction target for Scope 3 GHG is predicated on the successful completion of a pilot Municipal Solid Waste (MSW) reduction program, and the rollout and achievement of the 50% MSW reductions goal (see Goal 7 for details).

SCOPE 3 GHG REDUCTION TARGET	Units	FY 10	FY 11	FY 12	FY 13	FY 14	….	FY 20
Overall Agency Scope 3 Reduction Target (reduced from FY08 base year)	%	-3.1	-0.1	3.2	6.7	9.8	….	20.7
Sub-Target for Federal Employee Travel	%	-5.1	-3.7	-2.0	-0.1	1.5	….	13.3
Sub-Target for Contracted Waste Disposal	%	2.9	11.9	21.8	31.8	40.7	….	49.6
Sub-Target for Transmission and Distribution Losses from Purchased Energy	%	8.0	11.0	14.0	17.0	20.0	….	24.0

- **Sub-target a) - Federal employee travel.** This sub-target encompasses all employee travel, including employee business travel by air, employee business travel by ground (e.g., vehicle, rail, and water), and employee commuter travel. Employee travel emissions are related to future employment levels at TVA, participation in car/van pools, telecommuting programs, and recently enacted national fuel economy standards (CAFÉ standards) for passenger cars and light-duty trucks. TVA has set reduction targets by taking these factors into account in combination with the implementation methods described later in the section. TVA plans to conduct an employee survey in FY 2010 and 2011 to collect information on current employee business travel (non-air) and commuting patterns. The results of this survey will be used to benchmark current business travel and commuting practices, and evaluate future programs designed to further reduce GHG emissions from these activities. TVA plans to increase employee participation in car/van pool and/or telecommuting, and to decrease employee business ground travel through upgraded teleconferencing infrastructure.

- **Sub-target b) - Contracted waste disposal.** This sub-target encompasses contracted MSW (trash) and domestic wastewater (sewage) disposal. This sub-target does not include industrial solid waste (e.g., fly ash), industrial wastewater, and once through cooling water generated in the course of the normal TVA business of generating electric power (energy). TVA set the reduction targets using the OFEE Scope 3 GHG Emission Reduction Target Tool and User's Manual in combination with projected reductions in solid waste for disposal per Goal 7 Pollution Prevention and Waste Elimination.

- **Sub-target c) - T&D losses from purchased energy.** Scope 3 T&D loss emissions occur when TVA purchases energy from the grid that was not generated by TVA. Electric distribution systems transport electricity from power plants to end users. GHG emissions associated with this process include the losses that occur on the lines. The consumption of electricity on the line, also commonly referred to as line loss, results from facilities such as feeders, transmission lines, distribution lines, and substations as well as from equipment such as transformers, wires, and conductors. Since this line loss is a form of electricity consumption, there are indirect GHG emissions associated with the energy required to generate this electricity. Reduction targets were set using the OFEE Scope 3 GHG Emission Reduction Target Tool and User's Manual in combination with planned reductions in electricity purchases, replacing purchase power with on-site generation, and energy intensity reductions mandated by EISA 2007.

- **Other, as defined by TVA.** TVA currently has no other planned projects relating to targeted Scope 3 GHG emissions reductions. As opportunities to reduce other non-targeted Scope 3 emissions are identified and evaluated, these will be added to the plan in future years as appropriate.

2.b. Agency Lead for Goal

Implementation of Scope 3 GHG reductions will be accomplished by the following key groups and individuals:

- TVA Senior Sustainability Officer
- TVA Environmental Sustainability Manager
- TVA Environmental and Energy Sustainability Committee
- TVA Climate Regulatory Policy Team (RPT)

These groups and individuals will be supported by key areas of the TVA organization including the TVA Internal Energy Management Program headed up by the TVA Environmental Sustainability Manager. The TVA Environmental Sustainability Manager will communicate EO and other legislative requirements and implementation progress toward Scope 3 GHG reductions to the TVA Environmental and Energy Sustainability Committee and TVA Climate RPT. The TVA Manager of Sustainable Design, and the GHG reporting staff will assist the TVA Environmental Sustainability Manager.

2.c. Implementation Methods

To reduce emissions from employee travel, 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. To meet the Scope 3 GHG goals, TVA will do the following:

- **Increase use of Telework -** TVA formally established a Telework Program in 2001, allowing certain employees to work remotely from the office. The existing program is primarily used by employees who must perform job responsibilities during non-standard business hours, must work frequently in the field, or are essential to maintaining TVA operations. TVA will evaluate the results of two on-going pilot programs and revise/expand the existing TVA Telecommuting Policy as necessary in order to meet the GHG targets.

- **Increase use of car/van pools -** TVA has sponsored a vanpool program since 1974. Currently, there are approximately 750 participants (89 vans in operation), primarily employees at the nuclear and fossil plants. TVA will review the existing car/van pool program and evaluate and implement as necessary a formal program to encourage and/or provide incentives for increasing employee participation at the four office complexes.

- **Increase use of video and audio conferencing -** TVA continues to implement information technologies that enable employees to perform their jobs more efficiently while also saving energy and reducing GHG emissions. 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 that enable employees to travel less and conduct more meetings from their remote work sites, therefore saving fuel and related travel expenses. TVA plans to upgrade video and audio conferencing capabilities between FY 2011 and FY 2013, and increase

employee awareness of such capabilities in order to reduce employee business travel as appropriate in order to meet the GHG targets.

- **Contracted waste disposal reduction** - Scope 3 GHG emission reductions from contracted waste disposal will result from meeting Goal 7 (Pollution Prevention/Waste Elimination).

- **T&D Emission Reductions** - Scope 3 GHG emission reductions from T&D losses from purchased energy are a direct result of meeting Goal 1 (Scope 1 and 2 GHG Reduction), Goal 4 (High Performance Sustainable Design/Green Buildings), and Goal 6. Any reduction of purchased energy or the use of on-site (and preferably renewable) energy to offset purchased energy will result in reductions to T&D losses. In addition, EISA requires completing comprehensive energy and water evaluations on 25% of covered facilities each year. These evaluations will be used to identify energy and potable water reduction projects and strategies necessary to meet the T&D losses reduction target. These projects will be funded and implemented through current existing TVA project justification processes and any new sustainability funding initiatives developed within TVA.

2.d. Positions

TVA currently has two FTEs spending approximately 50% of their time dedicated to entering utility bill information into the TVA Internal Energy Management Program database, which tracks energy and water usage at TVA facilities. There is currently not a FTE dedicated to directly tracking GHG T&D Losses.

TVA currently has no FTEs tracking the information necessary to assess the Scope 3 GHG reductions from waste disposal and employee travel. TVA estimates that two FTEs will initially be required for this task, with additional FTEs needed as additional Scope 3 reductions are targeted.

III.2.e. Planning Table

Based on the narrative above, the targets for Scope 3 emissions reductions are presented in the table below.

SCOPE 3 GHG TARGET	Units[1]	FY 10	FY 11	FY 12	FY 13	FY 14	….	FY 20
Overall Agency Scope 3 Reduction Target (reduced from FY08 base year) [2]	%	-3.1	-0.1	3.2	6.7	9.8	….	20.7
Sub-Target for Federal Employee Travel [2]	%	-5.1	-3.7	-2.0	-0.1	1.5	….	13.3
Sub-Target for Contracted Waste Disposal	%	2.9	11.9	21.8	31.8	40.7	….	49.6
Sub-Target for Transmission and Distribution Losses from Purchased Energy	%	8.0	11.0	14.0	17.0	20.0	….	24.0
Other, as defined by agency	%	NA	NA	NA	NA	NA	NA	NA
Leveraged Investment (funded through annually recurring existing budget items, such as capital improvement, O&M, etc. or ARRA)	$ M	1.121	1.121	1.121				
Incremental Investment (funded through new program budget requests specific to this EO)[3]	$ M	0	1.543	1.453				
Alternative Investment (funded through ESPC, UESC, EUL, PPA, rebates, or other funding assistance)[2]	$ M	NA	NA	NA				

1 Cumulative percent reduction from FY 2008 base year.

2 TVA employment in FY 2010 increased by 6.5% over the FY 2008 base year.

3 costs for reducing T&D losses included in Goal 1.

2.f. Agency Status

TVA is currently conducting two pilot studies to evaluate enhanced employee telecommuting opportunities. One pilot involves employees telecommuting one day per week, while the other pilot is evaluating employees telecommuting five days per week. TVA plans to revise the Telework Program in FY 2011 based on the results of these two pilot studies.

The TVA vanpool program is operated by Fleet Management in the Supply Chain organization and is self-supporting. Since 2001, employees and contractors have been reimbursed for up to $65 monthly for participation. This reimbursement is a TVA benefit and is charged to the participant's organization. TVA plans to evaluate the car/van pool program and identify methods to increase employee participation during FY 2011, including incentives related to levels of participation.

The technologies in use by TVA to support reduction in employee travel are:

- **Video Conference Rooms** - TVA has 58 video conference rooms throughout the Tennessee Valley service area. Approximately 1,801 video conferences were held in FY 2009, an increase of 22 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 6 percent from FY 2007.

TVA has continually made progress toward the goals that directly impact meeting the sub-target for T&D losses. Going forward TVA will need to review its list of goal subject and excluded buildings that purchase energy from utility providers. Some goal subject buildings may not have been a part of the covered facilities survey plan. In addition, it may not be possible to reduce the energy usage of some excluded buildings energy because they perform a necessary function (generation and transmission of power). TVA will need more time and resources to evaluate additional buildings before a more accurate FY 2008 baseline can be provided.

GOAL 3: Develop and Maintain Agency Comprehensive Greenhouse Gas Inventory

3.a. Goal Description

A complete and accurate GHG emissions inventory is a critical data set for planning and assessing GHG emission reduction activities. Overall TVA GHG emissions are generated by sources in the Scopes 1, 2, and 3 categories. These GHG emissions sources include energy use in buildings, employee activities, and electrical power production. Consistent with the provisions of EO 13514, the emissions will be those associated with TVA building energy use (both goal subject and excluded buildings) and TVA employee activities. This will allow for a consistent approach with targets and inventory, and will provide data consistency within other federal agency reporting requirements. The electrical power production system emissions will be reported to the EPA annually beginning in 2011 per the requirements of the EPA GHG Mandatory Reporting Rule (GHG MRR) (40 CFR Part 98). Together, these inventories will provide a complete picture of TVA GHG emissions footprint.

3.b. Agency Lead for Goal

Implementation of GHG emission inventory reporting will be accomplished by the following key groups and individuals:

- TVA Senior Sustainability Officer

- TVA Environmental Sustainability Manager

- TVA Clean and Renewable Energy Group

- TVA Environmental and Energy Sustainability Committee

- TVA Climate Regulatory Policy Team (RPT).

These groups and individuals will be supported by key areas of the TVA organization including the TVA Internal Energy Management Program headed up by TVA's Environmental Sustainability Manager. TVA's Environmental Sustainability Manager will communicate EO and other legislative requirements, and implementation progress through the TVA Environmental and Energy Sustainability Committee and TVA's Climate RPT. TVA's Clean and Renewable Energy Group will assist TVA's Environmental Sustainability Manager.

3.c. Implementation Methods

The Scope 1, 2, and 3 GHG emissions not required to be reported by an EPA rule, other statue, or other regulatory agency will be determined and reported in accordance with procedures to be developed by the TVA Clean and Renewable Energy Group under the direction of the Agency's Senior Sustainability Officer.

A new Comprehensive EO 13514 GHG Reporting Plan highlighting the reporting procedures will be developed by the TVA Clean and Renewable Energy Group. This Plan will be developed from:

- Guidance issued by the CEQ per Section 9 of EO 13514, including the Scope 3 Target Tool and the "Federal GHG Accounting and Reporting Guidance,"

- Recommendations issued by DOE's Federal Management Program, and/or

- Other such procedures TVA deems necessary to implement to ensure that it is accurately quantifying and accounting for Scope 1, 2, and 3 GHG emissions in a manner consistent with the agency's mission.

The TVA GHG inventory shall be the basis for reporting targeted GHG reductions provided for in EO 13514.

3.d. Positions

TVA currently has two FTEs assigned to preparing the annual GHG emissions inventory from excluded Scope 1 and 2 sources required to be reported to EPA under the Mandatory Reporting Rule.

TVA currently has no FTEs assigned to preparing the annual GHG emissions inventory from targeted Scope 1, 2, and 3 sources, or from other sources excluded from both the EPA Mandatory Reporting Rule and the EO. TVA estimates that two FTEs will be required for this task, with additional FTEs needed as additional Scope 3 reductions are targeted.

3.e. Planning Table

COMPREHENSIVE GHG INVENTORY	Units	FY 10	FY 11	FY 12	FY 13	….	FY 20
Preparation of Inventory Report for Targeted Emissions	FTEs	2	2	3	3		5
Leveraged Investment (funded through annually recurring existing budget items, such as capital improvement, O&M, etc. or ARRA)	$ M	0.224	0.224	0.224			
Incremental Investment (funded through new program budget requests specific to this EO)	$ M	0	0.224	0.304			
Alternative Investment (funded through ESPC, UESC, EUL, PPA, rebates, or other funding assistance)	$ M	NA	NA	NA			

3.f. Agency Status

TVA has prepared and implemented GHG Monitoring Plans for subject emission sources and is currently preparing to report GHG emissions in 2011.

GOAL 4: High-Performance Sustainable Design/Green Buildings

TVA started its Sustainable Architecture Program in 1993. The program's purpose was to consider recycling of used building materials and purchase of more environmental building materials. This early pioneering sustainable building work by TVA resulted in a White House Closing the Circle award. The Federal Environmental Executive presented this award to the TVA in a ceremony held on the plaza between the TVA KOC twin towers. TVA has continued to build upon these early efforts and has been an active participant in the Interagency Sustainable Working Group since it was founded in 2001. TVA also assisted in the writing of the original Sustainable MOU which was the start of the "Sustainable Guiding Principles."

TVA updates facility information including sustainability through the TVA Environmental and Energy Sustainability Committee. This committee is the focal point for disseminating energy and related environmental information to TVA organizations and employees, and will be an essential part of the implementation plan to meet this high performance building goals. TVA maintains a database of all of its buildings and makes use of it to track energy/water consumption and energy conservation opportunities uncovered during energy surveys.

4.a Goal Description

EO 13514 and guidance from OFEE and OMB have established sub-target areas for High-Performance Sustainable Design/Green Buildings. TVA has developed and presented in the implementation section a number of strategies and methods to meet the following eight sub-target areas:

Sub-target a) - Beginning in FY 2020, all new Federal buildings are designed to achieve zero-net energy by FY 2030

Sub-target b) - All new construction, major renovation or repair and alteration of federal buildings complies with, "Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles)"

Sub-target c) - At least 15% of the TVA existing buildings and building leases meet guiding principles by FY 2015 [5,000 GSF threshold for existing buildings and building leases]

Sub-target d) - Demonstrate annual progress toward 100% conformance with Guiding Principles for entire building inventory

Sub-target e) - Demonstrate use of cost-effective, innovative building strategies to minimize energy, water and materials consumption

Sub-target f) - Manage existing building systems to reduce energy, water and materials consumption in a manner that achieves a net reduction in agency deferred maintenance costs

Sub-target g) - Optimize performance of the agency's real property portfolio – examine opportunities to decrease environmental impact through consolidation, reuse and disposal of existing assets prior to adding new assets

Sub-target h) - Ensure use of best practices and technology in rehabilitation of historic Federal buildings

4.b. Agency Lead for the Goal

Implementation of High-Performance Sustainable Design/Green Buildings will be accomplished by the following key groups and individuals:

- TVA Senior Sustainability Officer
- TVA Manager of Sustainable Design
- TVA Environmental Sustainability Manager
- TVA Environmental and Energy Sustainability Committee.

These groups and individuals will be supported by key areas of the TVA organization including the TVA Internal Energy Management Program. The High-Performance Sustainable Design/Green Buildings EO 13514 requirements (including zero energy buildings and new and existing building compliance with the Guiding Principles), will be lead by the TVA Manager of Sustainable Design, who is a part of the TVA Internal Energy Management Program headed up by the TVA Environmental Sustainability Manager. The Manager of Sustainable Design will communicate EO and other legislative requirements, and implementation progress through the TVA Environmental and Energy Sustainability Committee.

Optimizing performance of the TVA real property portfolio will be led by the TVA Property Acquisition, Management, and Leasing in TVA Facilities Management. Managing existing building systems to reduce energy, water and materials consumption will be led by regional engineers in TVA Facilities Management. This work will also be communicated through the TVA Environmental and Energy Sustainability Committee.

4.c. Implementation Methods

Sub-target a) - Beginning in FY 2020, all new Federal buildings are designed to achieve zero-net energy by FY 2030

For every new building that is built, TVA will strive to produce a design that uses 40,000 Btu/sf/yr or less. To approach zero net energy, TVA will evaluate the use of passive solar heating, active solar hot water heating, day-lighting, shading, and natural ventilation, and the use of on-site photovoltaic systems for every new building design. Those strategies that prove to be cost effective will be incorporated into the design. TVA recognizes that as time goes by the price of photovoltaic and other renewables will likely decrease, making it possible to meet this goal by 2030.

Sub-target b) - Ensure that all new construction, major renovation, or repair and alteration of Federal buildings comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles).

The TVA goals for High-Performance Sustainable Design/Green Buildings align closely with those outlined in EO 13423/13514, EPAct05 and EISA 2007. Although TVA builds few new buildings each year, those that have been built have incorporated the required Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles) and have been designed to perform 30 percent better than the ASHRAE 90.1 code or the International Energy Conservation Code. TVA will continue to meet these requirements for new buildings.

To ensure that no new construction or major renovation takes place without accounting for these requirements, a new construction/major renovation check box will be added to the NEPA review that is performed for every TVA action dealing with the environment. This box simply asks the question: "Does this action involve the construction of a building or major renovation to an existing building?" If checked when the review is submitted electronically, this will generate an email sent to a special mailbox that has already been set up for Internal Energy Management (IEMP) staff to check periodically. Staff can then follow up with the appropriate people to ensure that they are aware of the Sustainable Guiding Principles and can apply them to the building.

Whenever the need for new space is identified or renovation of an existing space is needed, the TVA Standard Process and Procedure SPP 3.2 - Internal Energy Efficiency Process (Including Potable Water and Sustainability as Related to Energy) and SPP 3.3 - Resource Efficient Building Design Process shall be followed. Both of these processes make up the TVA Sustainable Buildings Implementation Plan.

All new Requests for Proposals for contracted building design services shall include the Sustainable Guiding Principles including the need for documentation that verifies compliance. Additional funding to meet these requirements will be provided as part of the overall project cost by the TVA group requesting new building space. The IEMP staff will work closely with the major TVA groups to ensure that this language is included. Communications on this requirement as well as other EO requirements will be done through the TVA Environmental and Energy Sustainability Committee.

Sub-target c and d) - Ensure that at least 15 percent of the TVA existing buildings (above 5,000 gross square feet) and building leases (above 5,000 gross sf) meet the Guiding Principles by FY 2015 and that TVA makes annual progress toward 100% conformance with the Guiding Principles for its building inventory.

TVA is working toward meeting the retrofit of 15 percent of its existing buildings using The Sustainable Guiding Principles. The TVA original strategy was to retrofit its two largest major buildings--the COC and the KOC. These two buildings represent 21 percent of TVA goal subject buildings as defined by EPAct05. Following current EO 13514 directives to exclude buildings that are 5,000 square feet or less, the COC and KOC would represent 25 percent of TVA square footage subject to this requirement. However, with the OMB's recent policy to count square footage reporting less than numbers of buildings through the Federal Real Property Portfolio (FRPP) database, TVA is adjusting this strategy.

TVA is not subject to the FRPP EO but will voluntarily supply a complete inventory of buildings to the database that can be used to count progress toward the 15 percent requirement and beyond. TVA will continue to concentrate on applying the Sustainable Guiding Principles to the COC and KOC since this approach will have the greatest impact on reducing agency energy use and environmental impact as opposed to doing a greater number of smaller buildings. TVA is working with OMB to allow TVA to show incremental progress (implementing individual requirements of the Sustainable Guiding Principles) as counting toward progress in meeting the 15 percent requirement on the OMB Scorecard. In the future, TVA will expand beyond the COC and KOC, and will start applying the Sustainable Guiding Principles to many of its smaller buildings. This will not only help with quantity accounting through the FRPP but will help demonstrate annual progress toward 100% conformance.

Sub-target e) - Pursue cost-effective, innovative strategies, such as highly reflective and vegetated roofs, to minimize consumption of energy, water, and materials.

TVA has a long history of conducting building energy surveys and cost analysis on potential energy conservation opportunities (ECOs). TVA does not receive taxpayer dollars but is funded through power revenue so building energy projects must compete for funding on a cost-effective basis. TVA has an ECO evaluation form that is used to evaluate potential projects and takes into account all of the various life cycle attributes. These forms are stored electronically on the TVA Internal Energy Management database by building. TVA will not only continue its past practice of implementing ECOs when a building is renovated but will also pursue targeted funding for cost-effective ECOs that support legislative and EO directives.

TVA is also reaching out beyond the agency to obtain expertise to identify innovative strategies. TVA is in a unique position in that it has the lowest Btu/sf/yr energy use of all Federal agencies for its goal subject buildings. TVA energy use is currently less than 60,000 Btu/sf/yr compared to the rest of the Federal Government which is averaging 110,000 Btu/sf/yr. To reduce this further, TVA has contracted with a nationally known energy/sustainability company to review past TVA work and make innovative energy/water/sustainable recommendations to achieve even better performance. The results of this collaboration will be a list of "next generation / dream" energy efficiency projects for analysis and study.

Sub-target f) - Manage existing building systems to reduce the consumption of energy, water, and materials, and identify alternatives to renovation that reduce existing assets' deferred maintenance costs.

TVA's existing building systems will be operated and maintained to optimize the asset's value to TVA. This shall include operational activities for efficient, safe, and reliable operations while maximizing the life of the building systems. This will be accomplished using the most cost-effective and practical solutions ranging from control through building automation systems to

manual operations. Paramount to this strategy is the safety, comfort, and productivity of building occupants.

In conjunction with optimized operations will be an optimized maintenance program to ensure that the assets continue to perform as originally designed and intended without diminished quality, reliability, efficiency, or life. Appropriate frequencies and levels of maintenance will be determined based on evaluations of the value of the asset, cost of the maintenance, regulatory/safety code requirements, productivity of occupants or users, manufacturers recommendations, and the importance of the asset to TVA. These maintenance activities will be scheduled using the TVA work management system. A key facet of the maintenance program will always be safety.

TVA's existing funding activities currently have weighting for regulatory requirements and commitments. These funding mechanisms look at all important project aspects including safety, regulatory requirements, economics, asset preservation, and commitments, and prioritize funding based upon these. By using these existing systems and processes, and with an increased emphasis on sustainability in the agency, TVA will implement high priority sustainability projects as well as consider the sustainability aspects in all projects.

Sub-target g) - When adding assets to the agency's real property inventory, identify opportunities to consolidate and dispose of existing assets, optimize the performance of the agency's real-property portfolio, and reduce associated environmental impacts.

The TVA-managed Corporate Real Estate (CRE) Portfolio consists of approximately 2.5 managed square feet (MSF) supporting a population of knowledge workers totaling approximately 5,000. TVA uses a model developed in 2002 to determine "core" buildings versus "non-core" buildings for the purpose of collaboration with the Asset Preservation program which allocates dollars for capital improvements for building envelopes and systems for our core properties. The non-core properties are then put in a program for further evaluation regarding disposal and "mothballing."

The model and methodology was developed in 2001 as a response to a declining workforce and a stable portfolio of space that needed to be reduced. Known as the TVA Facilities Strategic Plan, the plan was approved by the TVA Board of Directors in 2001 and received an achievement award in the "Asset Management" category for "Real Property Innovation" in 2003 from the General Services Administration.

Results of the plan include a reduction from 3.5 MSF to the current level of 2.5 MSF, removal of approximately 100 buildings from TVA corporate portfolio, elimination of non-essential spending on non-core properties, and more strategic alignment of the knowledge workforce with the TVA business planning due to the resultant consolidations.

TVA continually updates this plan for a 3 to 5 year scenario planning outlook and continues to take steps to maximize the CRE Portfolio, providing the right amount of space in the right locations to enable TVA employees to do their jobs effectively.

Sub-target h) - Best practices and technology in rehabilitation of historic Federal buildings

TVA currently has an inventory of over 100 federally owned historic buildings comprising a very small portion of the Agency's total real estate portfolio. TVA must consider the effect of its actions on eligible buildings and structures throughout the Tennessee Valley as projects are

developed. Historic buildings include corporate office buildings, warehouses, and laboratories. While TVA's dams and hydroelectric plants are not covered under EO 13514, these structures must comply with the renovation, maintenance, and rehabilitation requirements of the National Historic Preservation Act (NHPA).

The TVA Historic and Archeological Compliance Staff work to ensure that TVA complies with Federal regulations and EOs governing historic preservation of federal properties, including:

- NHPA of 1966, Sections 106 and 110,
- Archaeological Resource Protection Act (ARPA),
- Native American Graves Protection and Repatriation Act (NAGPRA),
- EO 13514: Federal Leadership in Environmental, Energy and Economic Performance, and
- EO 13287: Preserve America.

TVA reviews each project for compliance with regulations and, as appropriate, consults with State Historic Preservation Officers (SHPO), federally recognized tribes, and other consulting parties. Copies of Section 106 Consultation letters are entered into the Electronic Document Management System (EDMS) for record-keeping. TVA also tracks compliance with NEPA using the Environmental Information Center or the EDMS.

To comply with this sub-target, TVA plans to submit the selection of a Senior Real Property Official for compliance with the EO 13327 requirements. TVA will also benchmark its compliance with Section 106 and Section 110 of the NHPA against other federal agencies. TVA will complete this work by April 2011 as part of the TVA Natural Resource plan. TVA will include sufficient funding and staffing to meet regulatory compliance requirements of NHPA (Section 106 and 110), and include this goal in the TVA Natural Resource Plan. TVA will improve coordination and relationships with SHPO and the Advisory Council on Historic Preservation.

4.d. Positions

TVA currently has one manager responsible for zero-net energy buildings and for ensuring that existing buildings as well as new construction meets the Sustainable Guiding Principles. The manager will be supported by a LEED-accredited architect in the TVA Facilities Management (FM) group. Other FM architects responsible for new building projects and supporting contracted A/E services will provide additional support.

TVA currently has two managers responsible for pursuing innovative cost-effective building strategies. Their efforts will be supported by additional IEMP staff and interns, and TVA FM architects and project managers responsible for building renovation projects.

TVA FM has site-engineering managers with staff that support building systems renovations and new construction. These managers, with guidance and assistance from TVA Environmental and Energy managers and staff, are tasked with supporting projects that meet EO requirements. TVA Facilities Management Realty Group has been successfully consolidating space over the last couple of years and currently has adequate staff to continue these efforts.

TVA will need to hire one-and-a-half FTE for Preservation Planning in 2011 and employ one-half FTE in Information Services for database structure as well as hire consulting services to develop a database of historic buildings and structures. Finally, TVA will need staff to report quarterly and this will require one-half FTE to track and report on compliance, number of projects reviewed and number missed and monitor improvement.

4.e. Planning Table

SUSTAINABLE HIGH PERFORMANCE BUILDINGS Buildings Meeting Guiding Principles [i]	Units	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15
Owned Facilities Targets	%	1.9	3.1	4.2	5.4	6.6	7.8
Leased Facilities Targets	%	3.1	5.1	7.2	9.2	11.2	13.2
Total Facility Targets 1	%	5	8.2	11.4	14.6	17.8	21
Other, as defined by agency	?	N/A	N/A	N/A	N/A	N/A	N/A
FTEs	#	2.5	2.5	2.5			
Leveraged Investment (funded through annually recurring existing budget items, such as capital improvement, O&M, etc. or ARRA)	$ M	685.46	1,393.0	859.28			
Incremental Investment (funded through new program budget requests specific to this EO)	$ M	0.00	3,637.81	6,362.87			
Alternative Investment (funded through ESPC, UESC, EUL, PPA, rebates, or other funding assistance) 2	$ M	0	0	0			

1. Applies to buildings at least 5,000 square feet (sf). Calculations do not include incremental cost associated with selecting a different leased facility. The costs reflect actual quantifiable costs such as third party certification programs, facility upgrades, or similar. If there are no quantifiable costs, $0 is entered for costs. The write up describes TVA's methodology for working towards the goal.
2. These percentages assume that OMB will allow agencies to report incremental progress by square footage when applying the sustainable guiding principles to large buildings.
3. Projects for TVA 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 uses Utility Energy Savings Contracts (UESC) when working with Federally Directly Served customers. TVA facilities are currently supplied energy and water either through TVA's own generation or electric, gas and water distributors. In the future, TVA will explore the feasibility of funding and pursuing the use of UESC or Energy Savings Performance Contracts (ESPC) to meet TVA Sustainability Goals.

4.f. Agency Status

In past years, the TVA Environmental Sustainability Manager working with an FM architect has proven that it is possible to design new buildings that approach net-zero energy use. For example, TVA developed a new design for the Johnson City Customer Service center that incorporated a wide range of cost-effective energy and sustainable features such as decentralized geothermal heat pump HVAC, north facing clerestory windows, perimeter

windows and light tube skylights for day-lighting, light-colored roof, task/ambient lighting system, membrane heat exchange system, permeable paving, rain water collection and reuse for irrigation and vehicle washing, waterless urinals, high efficiency hand dryers, and sustainable materials and finishes. Even though this building was not built, whole building energy analyses proved that the design would use only 20,107 Btu/sf/yr. This value is significantly below the TVA typical office energy use of 60,000 Btu/sf/yr. This low energy use would make it possible to apply photovoltaic solar panels to provide the remaining energy requirement and achieve net-zero energy use.

TVA has only built new buildings at TVA plant sites in recent years. These buildings are prefabricated metal buildings that are used as shops and warehouses, and are less than 5,000 sf. Though not required under EO 13514, TVA did incorporate the Sustainable Principles to the extent applicable in these buildings per EO 13423 by incorporating strategies such as day-lighting, passive solar heating with fixed overhangs for summer shading, increased insulation, and efficient lighting controlled by photocells and occupancy sensors.

In FY 2010 TVA began design work on a major 65,000-sf training center to support power plant operations. The TVA Manager of Sustainable Design has been working closely with the FM architect and contracted A/E services to incorporate the Sustainable Principles and to ensure that the building will perform 30% better than the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 90.1 energy code.

During the past year, TVA has also worked to incorporate many of the requirements of the Sustainable Guiding Principles in the COC and KOC. TVA completed Energy Star certification for both buildings, a sustainable assessment of the KOC, and benchmarking of the COC energy use. TVA also met ASHRAE ventilation and thermal standards at the COC and KOC, and provided occupant-controlled lighting at the COC. The TVA work being performed in FY 2010 includes installation of more efficient lighting (all of KOC and COC secondary spaces), installation of workstation occupancy sensors to reduce energy use at the COC, plumbing fixture retrofits at the KOC, new sprinkler heads to reduce 50% of landscaping water use at the KOC, and the completion of a comprehensive day-lighting study of the COC. The TVA work planned for next fiscal year and beyond is new efficient open office lighting with day-lighting controls for the COC, documentation of an integrated team approach for both COC and KOC and integration with the TVA EMS, occupant feedback study at the KOC and COC, installation of a domestic solar hot water system for the KOC, and documentation of the use of low emitting materials and current TVA office recycling services at the KOC and COC.

Since TVA started the EISA surveys in FY 2009, $16.75 million of energy and water improvements have been identified with a potential savings of $2.15 million/yr. This results in a simple payback of 7.8 years. These cost-effective projects include energy efficient lighting and HVAC upgrades, occupancy sensors to control plug loads, HVAC and lighting controls, insulation and window upgrades and plumbing fixture retrofits. TVA will continue the EISA surveys and has already obtained funding and is currently implementing many of these projects to help reduce agency energy and water use to meet EO goals and reduce operational costs.

A study of the COC energy management system is being completed in 2010. The study will provide an assessment of the current system and will provide options, costs, and potential savings for implementation of a new system. The project is scheduled for implementation in FY12 and FY13. In conjunction with this study is an evaluation of other building systems so all upgrades can be accomplished from an efficient holistic perspective.

TVA currently has a plan (Green Procurement Plan) for green procurement. This plan will be modified to include the requirements of the new EO. Currently the plan states that "The Energy Policy Act of 2005 and EO 13123 "Greening the Government through Efficient Energy Management" requires Federal agencies purchasing energy consuming equipment to purchase Energy Star products or energy-efficient products designated by the Department of Energy's Federal Energy Management Program (FEMP). Vendors who supply equipment to TVA must in turn comply with these guidelines. Equipment supplied on this contract has been identified by TVA to be subject to these energy efficiency requirements."

Rainwater collection studies, including potential costs and paybacks, will be captured as part of the comprehensive energy and water evaluations required on 25 percent of covered facilities each year.

Current projects in development include the disposal and potential redevelopment of an approximately 1,400-acre brownfield parcel in Muscle Shoals, AL, including 1.4M square feet of corporate, warehouse and abandoned industrial space. This was a collaborative effort between TVA and the local governmental agencies that have jurisdiction in the four cities surrounding the parcel.

TVA maintains strategic regional plans for major operations centers and is annually monitoring costs for operations and maintenance and suitability for workplace alignment, as well as local real estate market information.

Going forward, TVA will focus on workplace strategies to maximize the square footage utilization and continue to align with the enterprise strategic business planning while exploring opportunities to reduce square footage, collaborate with business units, support organizations, and create opportunities for economic development in the Tennessee Valley.

TVA states in the 2008 Environmental Policy the commitment to "demonstrate leadership through the ecologically sound management of natural resources and the protection of cultural and heritage resources." To this end, TVA has a policy requiring that projects be reviewed and address NEPA and NHPA requirements, which includes the review of potential impacts on natural and cultural resources, including historic structures.

TVA is currently preparing a comprehensive assessment of historic buildings and structures at the Muscle Shoals Reservation. A comprehensive assessment is needed for all remaining TVA historic buildings and structures across the Tennessee Valley.

GOAL 5: Regional and Local Planning

5.a. Goal Description

This goal, which is not included in EO 13423, is a new directive under the EO 13514 to advance regional and local integrated planning. For FY 2010, TVA is already conducting many activities that specifically address three of the five sub-targets included in this section (5a, 5b, and 5e). Activities to address sub-targets 5c and 5d have been identified within this plan and are described in detail. They can be integrated into the TVA existing operations as appropriate to streamline the overall goal implementation.

The sub-targets are listed below along with TVA-specific goals identified for each.

Sub-target 5a) - Incorporate participation in regional transportation planning, including recognition and use of existing community transportation infrastructure, into agency policy and guidance.

1. TVA will review 25 to 50 percent of pertinent metropolitan and rural transportation plans within its service area, depending on the planning cycle stages for the year.

Sub-target 5b) - Align agency policy to increase the effectiveness of local energy planning.

1. TVA will strive to increase the number of Green Power Switch customers.

Sub-target 5c) - Ensure that planning for new Federal facilities or new leases includes consideration of sites that are pedestrian friendly, near existing employment centers, and accessible to public transit, and emphasize existing central cities and, in rural communities, existing or planned town centers.

Sub-target 5d) - Update agency policy and guidance to ensure that all EISs and Environmental Assessments (EAs) required under NEPA for proposed new or expanded Federal facilities identify and analyze impacts associated with energy usage and alternative energy sources.

Sub-target 5e) - Update agency policy and guidance to ensure coordination and (where appropriate) consultation with Federal, State, Tribal and local management authorities regarding impacts to local ecosystems, watersheds and environmental management associated with proposed new or expanded Federal facilities.

1. TVA will increase hosting and/or participating in collaborative efforts focused on water quality, water quantity, and community development practices.

2. TVA will increase stakeholder participation in collaborative opportunities (meetings, projects and partner agency plan reviews).

5.b. Agency Lead for Goal

TVA leads are described for each sub-target below:

- TVA's Valley Relations and Environment and Technology (E&T) are responsible for reviewing and commenting on draft transportation plans prepared by municipal or rural planning organizations in TVA's service area.

- The Director of Environmental Policy, Clean and Renewable Energy (who reports to the Senior Vice President of E&T) will be responsible for overseeing the implementation of the TVA renewable energy portfolio.

- The Environmental Policy, Clean and Renewable Energy; Customer Relations; and Energy Efficiency and Demand Response organizations will be responsible for regional energy planning.

- Power System Operations (PSO) and FM will lead activities to support the sub-target goals of planning new federal facilities in locations near existing cities and existing or planned town centers as well as in pedestrian-friendly locations accessible by public transit.

- E&T, which is responsible for environmental permits and compliance, will identify and analyze energy impacts and alternative energy sources as a result of compliance activities associated with NEPA EIS and EA compliance activities for new facilities.

Support for consultation and collaborative partnerships with Federal, State, Tribal, and Local agencies or programs will need support from the following TVA leadership:

- TVA Senior Sustainability Officer,

- VP, Land and Shoreline Management,

- VP, Environmental Science and Resources,

- TVA Environmental Sustainability Manager,

- Senior Manager, Federal Determinations,

- Senior Watershed Managers,

- Senior Manager, Commercial and Dispersed Recreation,

- Senior Manager, Reservoir Land Use and Permitting, and

- Senior Manager, Business Support and Project Management.

Implementation will be lead by the following TVA Business Units:

- Watershed Team Staff,

- Growth Readiness Program Staff,

- Recreation Staff,

- Natural Resource Management Staff,

- Heritage and Cultural Staff, and

- NEPA Staff.

5.c. Implementation Methods

Sub-target 5a: Participate in Regional Transportation Planning

TVA will increase involvement with Regional Transportation Organizations (RTO) and/or Metropolitan Planning Organizations (MPO) in states for which TVA has operational interests. TVA will expand the review function to other TVA states, where appropriate, based on the amount of operational interests/facilities present. Given the varied planning cycles in the states (updates every 4 to 5 years), a range of "25 to 50% of plans reviewed" will be used to monitor progress for this goal. A more specific sub-target can be set for each particular year.

TVA will determine the regional and metropolitan planning organizations in the region that may be suitable for TVA participation. Once identified, TVA will review Long Range Transportation Plans (LRTPs) and Transportation Infrastructure Plans (TIPs), and provide input, as appropriate, during the organization planning cycles. TVA will also integrate this activity into employee Performance Review and Development (PR&D) documents and business planning.

Sub-target 5b: Align Agency Policy to Increase Effectiveness of Local Energy Planning.

The TVA Generation Partners program will continue to work with communities and other groups to ensure that proper planning is performed to assist in building the renewable generation portfolio for the Tennessee Valley. Currently, TVA is working with Solar America Cities across the Tennessee Valley to make solar energy a more viable option for these communities. Solar America Cities uses innovative approaches to remove market barriers to solar energy and to encourage adoption of solar energy technologies at the local level. In addition, TVA also has a MOA with the Kentucky Energy and Environment Cabinet to assist in the development of clean and renewable energy initiatives. TVA will actively participate in regional and local planning meetings to help facilitate the use of renewable generation.

TVA will work with participating local public power companies and the environmental community to increase the sale of Green Power Switch® each year to produce electricity from renewable sources and to add to the Tennessee Valley power mix. The Green Power Switch a program in which residential and commercial business customers can sign up and choose the number of green power blocks they wish to purchase each month through the local power distributors.

TVA will also actively provide guidance to communities and other stakeholders about the development of renewable generation.

Sub-target 5c: Plan New Federal Facilities in Locations near Existing Cities and Existing or Planned Town Centers

At its discretion where appropriate and practicable, TVA will include access to public transit, walking trails and restaurants to the site selection analysis and decision model and include local planning officials in regional asset planning for TVA corporate real estate.

Access to public transit, walking trails and restaurants will be part of this analysis and decision model. Prior to site selection actions, or in alternative scenarios, TVA will include local planning officials in collaborative efforts and will include this process in regional asset planning for TVA corporate real estate.

Beginning in FY 2010, TVA Facilities Management, under the agency lead of Power Systems Operations, will implement a site selection criteria matrix into our Response for Proposal (RFP) process for new owned or leased space that will consider location advantages for center city or town center locations where adjacencies to public transit and other alternative transportation methods are readily available. This matrix will become part of our site selection process along with price, schedule, and operational location criteria. The matrix will also include and weigh selection components such as adjacency to bicycle trails, greenways, and alternative transportation corridors.

Sub-target 5d: Identify and Analyze Energy Impacts and Alternative Energy Sources for NEPA-Compliant EIS and EA for New Facilities

By the end of FY 2011, TVA will revise TVA NEPA guidance to provide instructions to NEPA document preparers for addressing energy usage and alternative energy sources, and to address these issues in EA and EIS assessments for new and expanded non-power facilities. Also by the end of FY 2011, TVA will add a statement to the NEPA document review checklist addressing compliance with this goal. TVA will address the issue of energy impacts and explore alternative energy sources in relevant EA and EIS reports.

Sub-target 5e: Update TVA Policy to Coordinate with Federal, State, Tribal, and Local Management Regarding Impacts to Local Ecosystems, Watersheds, and Environmental Management Associated with Proposed or New Federal Facilities.

TVA will identify Federal, State, Tribal, and Local stakeholders and/or programs that share common goals with the TVA regional and local planning and stewardship efforts. TVA will also include partnership/coalition development into employee performance review and development plans. TVA will allocate funds and employee time as TVA contributes toward collaborative stewardship efforts (i.e., grant match, employee time as in-kind match, or supplemental materials and supplies).

More specifically, TVA will:

- Improve reservoir and stream-water quality, and leverage alliances with local and regional stakeholders to promote the use of best practices in water conservation and community planning techniques through Growth Readiness and other programs. The goal is to increase TVA hosting and/or participation in collaborative efforts focused on water quality, water quantity, and community development practices.

- Include coordination with Federal, State, Tribal and Local stakeholders, as appropriate, in planning future use and management of TVA Public Lands. Coordination with these stakeholders will occur at each planning opportunity and will be measured by the number of letters and emailed comments received, and the number of meetings held with stakeholders.

- Promote collaboration of Federal, State, Tribal and Local stakeholders in natural resource management initiatives on TVA public lands, and will increase participation in collaborative opportunities (meetings, projects and partner agency plan reviews).

The lead for implementing the three actions above is the VP of Land and Shoreline Management.

Finally, TVA will develop a Natural Resource Plan with input from Federal, State, Tribal, and Local stakeholders that will provide agency guidance on our stewardship work including: water quality/quantity, land management, recreation, and natural resources. The lead for ensuring that stakeholder input is received and incorporated is the SSO.

5.d Positions

TVA will need 0.4 additional positions, described in more detail below, in addition to the leveraged resources already in place to support implementation of Goal 5:

- 0.4 FTE to expand existing review of transportation plans prepared by municipal or rural planning organizations in TVA-served states other than Tennessee and North Carolina

5.e. Planning Table

REGIONAL AND LOCAL PLANNING	Units	FY 10	FY 11	FY 12	FY 13	….	FY 20
Other, as defined by agency	?	N/A	N/A	N/A	N/A		N/A
Leveraged Investment (funded through annually recurring existing budget items, such as capital improvement, O&M, etc. or ARRA)	$ M	$4.2	$2.85	$2.26			
Incremental Investment (funded through new program budget requests specific to this EO)	$ M	$0	$0.040	$0.040			
Alternative Investment (funded through ESPC, UESC, EUL, PPA, rebates, or other funding assistance)	$ M	N/A	N/A	N/A			

5.f. Agency Status

Regional Transportation Planning

Currently, TVA reviews and comments on draft transportation plans prepared by municipal or rural planning organizations in Tennessee (as agreed to with the Tennessee Environmental Streamlining Agreement of 2008). TVA also reviews individual transportation projects as a participating or cooperating agency as defined by NEPA. TVA has a similar agreement with North Carolina. TVA is not involved in comparable transportation planning efforts in the other TVA states. Currently, less than 0.1 FTE per year is required to conduct these reviews.

Increase Effectiveness of Local Energy Planning

The TVA Environmental Policy adopted an objective to stop the growth in volume and reduce the rate of carbon emissions by 2020 by supporting reliable, affordable, lower-carbon dioxide (CO_2) energy opportunities. The Generation Partners and Green Power Switch programs will allow TVA to help meet the challenge of reducing carbon emissions.

TVA presently has a renewable power generation program known as Generation Partners where residential, commercial, or industrial power customers served by a participating power company of TVA are able to generate eligible renewable resources that include solar, wind, low impact hydro, and biomass. TVA purchases all of the green energy output at a rate of 12 cents per kilowatt-hour for solar and 3 cents per kilowatt-hour for other renewable generation as a premium payment above the retail rate and any fuel cost adjustments. All new Generation

Partners participants receive a $1,000 incentive to help offset start-up costs. The customer is guaranteed payments for 10 years from the start of the agreement with the local power company. Generation Partners support the environment by using renewable energy sources, and they reduce their monthly energy bills through the revenue they receive from the sale of the green power.

Generation Partners has a diverse portfolio of renewable generation products which includes biomass, landfill gas-to-energy, large solar, micro-hydro, residential solar, wastewater, and wind generation. In FY 2009, Generation Partners added 234 kW of renewable generation to the TVA portfolio with an expected goal of 80 MW of summer peak generation and 594 GWh of energy in FY2020:

Year	MW	GWh
2010	0	0
2011	0	0
2012	10	69
2013	21	152
2014	33	236
2015	45	320
2016	56	397
2017	64	460
2018	71	514
2019	76	558
2020	80	594

TVA and participating local public power companies, with input from the environmental community, created the Green Power Switch program. Under the program, electricity is produced from renewable sources and added to the Tennessee Valley power mix. Green Power Switch is sold to residential consumers in 150-kilowatt-hour blocks (about 12 percent of a typical household's monthly energy use). Each block adds $4 to the customer's monthly power bills. Consumers may buy an unlimited number of blocks. In other parts of the country, residential consumers who participate in green power programs pay an extra $2 to $10 per month for green power. Green Power Switch is also marketed to commercial and industrial consumers, who are requested to buy blocks based on the amount of energy consumed.

In FY 2009, the Green Power Switch program sold 87,306 MWhs of renewable energy to participating customers in the Tennessee Valley. Currently, TVA is planning to sell 93,980 MWhs in FY 2010.

Plan New Federal Facilities in Locations Near Existing Cities and Existing or Planned Town Centers

The TVA-managed Corporate Real Estate Portfolio consists of approximately 2.5 million sf supporting a population of employees totaling approximately 5,000, who are primarily located in major regional metropolitan centers including Knoxville, Chattanooga and Nashville, TN, as well as Muscle Shoals, AL, and various other Customer Service Centers across the Tennessee Valley.

This portfolio of space is centrally managed by FM through a collaborative effort with the business units that use the space as well as annual reviews of associated costs, market conditions, and alignment with the enterprise strategic direction.

The model and methodology was developed in 2001 as a response to a declining workforce and a stable portfolio of space that needed to be reduced. Developed as the "TVA Facilities Strategic Plan" (SFP), the TVA Board of Directors approved the plan in 2001 and TVA received an achievement award in the "Asset Management" category for "Real Property Innovation" in 2003 from the General Services Administration.

The SFP also contains strategic "regional site asset plans" for major operations centers and a designed strategy for consolidations to reduce the TVA overall footprint of space consumption. Facilities are classified as "core" or "non-core" based on market conditions, population, availability of adjacent "core" space and expenses both sunk and projected. The non-core properties are then placed in a program for further evaluation regarding disposal, mothballing, etc.

Identify and Analyze Energy Impacts, and Alternative Energy Sources for NEPA-Compliant EIS and EA for New Facilities

TVA is preparing to routinely address impacts associated with energy usage and alternative energy sources in EA and EIS for new and expanded non-power facilities.

Update TVA Policy to Coordinate with Federal, State, Tribal, and Local Management Regarding Impacts to Local Ecosystems, Watersheds, and Environmental Management Associated with Proposed or New Federal Facilities

Under NEPA, TVA currently coordinates and/or consults with Federal, state, and local agencies and tribes for actions that potentially affect their trust resources. Agencies frequently involved in these efforts include State Historic Preservation Officers, U.S. Fish and Wildlife Service, state environmental regulators, local development districts, and Native American tribes.

In addition, TVA recognizes the impact that operations have on the environment and is working to maintain quality of life and a sustainable environment for the region. The TVA Environmental Policy directs TVA to collaborate with stakeholders (Federal, State, Local, Tribal, and NGOs). TVA will implement the policy within its business operations: Water Resource Protection and Improvement; Sustainable Land Use; and Natural Resource Management. Each of these policy areas has initiatives, such as the Growth Readiness Program and other programs that support stewardship of water and natural resources and that engage collaboration among a variety of partners to support TVA's Environmental Policy. In addition, TVA is developing a Natural Resource Plan (see description below).

The following presents the current policy and programs as well as innovative efforts that have been identified but not yet implemented.

Current Policy and Programs:

a. The TVA Land Policy was approved by the TVA Board of Directors on November 30, 2006. The Land Policy defines how TVA manages reservoir, power, and commercial properties under its stewardship. This Policy governs how land is planned, including whether it is disposed of or retained. When the Board approved the new policy, they also

directed staff to review TVA-managed land designated for recreation and economic development purposes to verify the suitability of the properties for this use.

b. Programs/efforts underway in regards to the Land Policy:

- Reservoir Land Management Plans,
- Economic Development Program,
- Commercial and Public Recreation (leases or easements), and
- Power and Commercial Properties (non reservoir property and mineral holdings).

c. On May 19, 2008, the TVA Board of Directors approved the TVA Environmental Policy. This Policy will inform TVA business decisions as we continue to provide clean, reliable, and still-affordable energy, sustainable economic development, and proactive environmental stewardship.

d. Programs/efforts underway in regards to the Environmental Policy:

- Climate Change Mitigation,
- Air Quality Improvement,
- Water Resource Protection and Improvement,
- Waste Minimization,
- Sustainable Land Use, and
- Natural Resource Management.

Innovative efforts in planning currently underway:

The Natural Resource Plan (NRP) will evaluate the implementation of the TVA reservoir lands planning, natural resource management, water resources management, and recreation processes and strategies. The NRP presents an opportunity to evaluate the current planning process and land use allocation categories from a Tennessee Valley-wide perspective. The objective of the TVA natural resource management plan is to implement sustainable practices to balance protection of natural and cultural resources while providing dispersed recreation opportunities. The NRP will evaluate a variety of activities associated with the implementation of these activities. In May 1997, TVA issued an EA and Finding of No Significant Impact for activities associated with the clean water initiative, now called water resource activities. The NRP would include any changes to the types of activities and techniques evaluated in the previous EA, updates to NEPA documentation required for site-specific activities, and an evaluation of TVA ability's to issue grants for certain water resource activities. The NRP process is scheduled to conclude in late Spring 2011.

GOAL 6: Water Use Efficiency and Management

TVA is committed to better management and use of potable and non-potable water resources. This issue is central to TVA's core responsibility of maintaining the Tennessee Valley reservoirs and river system. Water is essential to all stakeholders. TVA recognizes that using less water is not only better for the environment but also reduces cost. TVA plans to implement several projects in the future to further reduce our water usage and become a leading example to the community on water use efficiency and management.

6.a. Goal Description

This goal is a directive under the EO 13514 to advance water use efficiency and management. The following are the four sub-targets identified in the EO for this goal:

Sub-target a) - Reduce potable water use intensity by 2% per year or at least 26% by FY 2020

Sub-target b) - Reduce industrial, landscaping, and agricultural water use by 2% per year or at least 20% by FY 2020

Sub-target c) - Identify and implement water reuse strategies

Sub-target d) - Achieve objectives established by EPA in Stormwater Guidance for Federal Facilities.

6.b. Agency Lead for Goal

Water use efficiency and management will be jointly led by a project manager in the TVA Environmental Sustainability group and a water manager in the TVA Fossil Group. Water use efficiency will be communicated through the TVA Environmental and Energy Sustainability Committee. In addition, implementation of Water Use Efficiency Sustainability goal for TVA will be accomplished by the following key staff:

- TVA Senior Sustainability Officer,
- TVA Environmental Sustainability Manager, and
- TVA Lead, High Performance Facilities Working Subcommittee.

These individuals will be supported by key areas of the TVA organization which are:

- TVA Environmental and Energy Sustainability Committee and
- Operation Business Units,

6.c. Implementation Methods

Sub-target a) - Reduce potable water by 2 percent per year from FY 2008 through FY 2020 (total 26% reduction) with base starting year of FY 2007.

EISA requires completing comprehensive energy and water evaluations on 25 percent of covered facilities each year. TVA will use these evaluations to identify potable water reduction projects and strategies necessary to meet the water intensity reduction target. TVA will fund and implement these projects through existing project justification processes and any new sustainability funding initiatives developed within TVA. Water use reduction may provide energy and GHG savings associated with reduced pumping and heating of domestic water, which will help meet Goals 1, 2, 4, and 7.

Sub-target b) - Reduce by 20% the total of non-potable water usage at TVA facilities with a focus on industrial processes by FY 2020 based upon a starting year of FY 2010.

TVA will focus on the industrial water consumption in the power production processes as the metric for this goal. The non-power production uses including landscaping and agricultural activities are insignificant relative to current industrial usage for TVA. Industrial water consumption means water used in the transport and storage of coal combustion byproducts such as ash and gypsum. Consistent with EO 13514, TVA is excluding from this goal water used for the production of power or steam for sale to others.

TVA has a tentative baseline established based upon historical records for industrial water consumption at its coal and nuclear plant sites. In FY10, TVA will confirm and fine tune the baselines and projected reductions for individual facilities. TVA will ensure that goals are set within the business planning process and provide for management commitments of the necessary resources to achieve the goal. The Environmental Sustainability Manager will review progress against identified goals and the plan. Goals and reporting will conform with TVA EMS requirements.

Sub-target c) - Identify and implement water reuse strategies

TVA will identify, promote, and implement water reuse strategies that reduce potable water consumption. EISA requires completing comprehensive energy and water evaluations on 25 percent of covered facilities each year. TVA will use these evaluations to identify water reuse projects and strategies. TVA will fund and implement these projects through the existing TVA project justification processes and any new sustainability funding initiatives developed within TVA.

Sub-target d) - Achieve objectives established by EPA in Stormwater Guidance for Federal Facilities

The EPA Technical Guidance (EPA 841-B-09-001, December 2009) requires federal agencies to maintain or restore to the maximum extent technically feasible (METF) the pre-development hydrology of a property with regard to temperature, rate, volume and duration of flow.

TVA currently meets Federal, State, and local requirements for use of Best Management Practices in stormwater design and construction. TVA also incorporates a NEPA compliance review in development of properties, and maintains National Pollutant Discharge Elimination System (NPDES) permits for many sites. TVA plans to identify appropriate departments that

will be responsible for leading improvement of existing stormwater design processes across the organization. The TVA departments will assess current design and construction review processes to identify appropriate compliance check-points. In addition, the TVA departments will educate project management staff in all design and construction groups about the new requirement. TVA will also add a new requirement to standard contract language for engineering, architecture, and construction services, and to work with cross-functional teams and Supply Chain to accomplish this task. TVA will also add a checklist item to the existing NEPA checklist and integrate additional requirements with existing compliance record-keeping and reporting system.

6.d. Positions

TVA currently has two FTEs spending approximately 50 percent of their time dedicated to entering utility bill information into the TVA Internal Energy Management Program database, which tracks energy and water usage at TVA facilities. There will also be two FTEs spending approximately 25 percent of their time dedicated to tracking progress and reporting.

TVA Facilities Management has site-engineering managers with staff that supports building systems renovations and new construction. These managers with guidance and assistance from TVA Environmental and energy managers and staff are tasked with supporting water reuse projects.

TVA may need to add one FTE for the first year to develop the stormwater program, educate the wide group of affected project managers and engineers and including IT support for electronic tracking system improvements. In addition, TVA will need to hire a consultant for training.

6.e. Planning Table

WATER USE EFFICIENCY AND MANAGEMENT	Units	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY16 to 19	FY 20
Potable Water Reduction Targets (gal/SF reduced from FY07 base year)	%	6%	8%	10%	12%	14%	16%	….	26%
Planned Potable Water Reduction (gal/SF reduced from FY07 base year)	%	6%	8%	10%	12%	14%	16%	….	126%
Industrial, Landscaping, and Agricultural	%	-	7%	13%	13%	17%	18%	25%	25%

WATER USE EFFICIENCY AND MANAGEMENT	Units	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY16 to 19	FY 20
Water Reduction Targets (gal reduced from FY10 base year)									
Planned Industrial, Landscaping, and Agricultural Water Reduction (gal reduced from FY10 base year)	Mgal	0	25.2M	45.6M	45.6M	56.5M	60.2M	84.9M	84.9M
Other, as defined by agency	?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FTEs	#	8.6	13.6	13.6					
Leveraged Investment (funded through annually recurring existing budget items, such as capital improvement, O&M, etc. or ARRA)	$ M	30,720.6	49,129.1	17,000					
Incremental Investment (funded through new program budget requests specific to this EO)	$ M	0.00	314.38	109.54					

WATER USE EFFICIENCY AND MANAGEMENT	Units	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY16 to 19	FY 20
Alternative Investment (funded through ESPC, UESC, EUL, PPA, rebates, or other funding assistance) 1	$ M	0	0	0					

1 Projects for TVA 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 uses the Utility Energy Savings Contract (UESC) when working with our federally directly Served customers. TVA facilities are currently supplied energy and water either through its own generation or electric, gas and water distributors. TVA plans to explore the feasibility of using the UESC or Energy Savings Performance Contract (ESPC) to meet these targets.

6.f. Agency Status

During FY 2009, energy surveys including water were conducted at multiple TVA sites covering 4.7 million square feet. TVA consumed 711.2 million gallons of potable water in FY 2009 at an estimated cost of $2.7 million. These numbers include water consumption from excluded buildings. To date, and as required by EISA, TVA has identified projects with a potential water savings of 13 million gallons. TVA will continue its EISA surveys to identify water-saving projects. TVA considers water management plans as part of its operation and maintenance activities.

TVA jointly funds and manages projects with external research partners to reduce water resource impacts by identifying technologies that increase water use efficiency and water conservation (EPRI); and to develop alternative water supply and use opportunities (e.g., using POTW grey water).

TVA currently has multiple water-savings projects underway at several office buildings. These projects include installing low-flow water closets, urinals, showerheads, and low-flow aerators for lavatories and sinks throughout these buildings. In addition, TVA has plans to look at water reuse through a rooftop rainwater collection systems being considered for the COC. This water would be collected and stored for use in flushing toilets and urinals.

The primary current uses for industrial non-potable water within TVA are in the coal and nuclear power generation facilities. At present the industrial usage is approximately 340.2 million gallons a year (MGY). This is based on historical averages reported in wastewater discharge permits for the steam electric generation facilities. Non-industrial uses also include fire protection system flushes/leakage, road/landfill dust control applications, vehicle and equipment wash racks, and HVAC once-through cooling water. These uses are an insignificant portion of the total non-potable water use.

TVA has developed plans to eliminate all wet ash and gypsum storage in the system and convert its 11 operating coal-fired power plants to dry storage. The movement away from wet fly

ash systems will help to reduce the overall use of water in the TVA power generation facilities and help to meet sustainability goals as required by EO 13514. The conversion plan has been developed and capital costs have been estimated. The conversion to dry fly ash will eliminate ash sluice wastewater generation and reduce industrial water usage. In addition, plans include the installation of 11 bottom ash dewatering systems as well as four gypsum dewatering processes. The goals are to install state-of the-art equipment to ensure safety, exceed regulatory requirements, and improve the TVA sustainability posture. These projects will position TVA as an industry leader in the management of coal combustion residuals. TVA expects the overall program to cost $1.5 to $ 2 billion dollars. Additional projects to contribute to further reductions may be identified and funded as necessary to further reduce non-potable water usage throughout TVA.

TVA will develop a system for data tracking and collection in order to confirm the usage baseline and to track progress toward the goal. This will be compiled and reported annually. The High Performance Facilities Team will monitor progress and maintain reporting responsibility for this goal.

GOAL 7: Performance Review: Pollution Prevention and Waste Elimination

7.a. Goal Description

Ninety-nine percent of the consumer products on the market today are consumed within six months of purchase. The first step to preventing and eliminating waste is reducing the amount of material in use. The next step is to reuse materials until they reach the end of their lives, and then to recycle materials that cannot be eliminated.

TVA has a strong program in place to prevent pollution by reducing chemical usage and using acceptable alternatives. TVA's recycling and reuse programs are also well established, although there is room for improvement in all of the TVA pollution prevention and waste elimination programs.

TVA goals are in alignment with the goals in EO 13514 and TVA has adopted each of the following eleven sub-targets:

Sub-target a) - Minimize the generation of waste and pollutants through source reduction.

Sub-target b) - Divert 50 percent of non-hazardous solid waste, excluding construction and demolition debris, by the end of FY2015. TVA will focus on the diversion of the municipal solid waste generated at all sites but will report the status of diversion at corporate locations separately from the non-corporate locations. By reporting the components separately, TVA will be able to focus on those areas that will yield the largest gains for our agency goal while still allowing the less significant (ton wise) projects to obtain recognition.

Sub-target c) - Divert 50 percent of construction and demolition materials and debris by the end of FY 2015.

Sub-target d) - Reduce printing paper use

Sub-target e) - Increase use of uncoated printing paper containing at least 30 percent postconsumer waste (PCW) fiber.

Sub-target f) - Reduce and minimize the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of at TVA.

Sub-target g) - Increase the diversion of compostable and organic material from the waste stream.

Sub-target h) - Implement integrated pest management and other appropriate landscape management practices.

Sub-target i) - Increase TVA use of acceptable alternative chemicals and processes in keeping with the agency's procurement policies.

Sub-target j) - Decrease TVA use of chemicals where such a decrease will assist TVA in achieving GHG emission reduction targets.

Sub-target k) - Report in accordance with the requirements of sections 301 through 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986. TVA is currently achieving this sub-target by reporting in accordance with the requirements of sections 301 through 313 of EPCRA (42 U.S.C. 11001 *et seq.).*

7.b. Agency Lead for Goal

Implementation of Goal 7 reductions will be accomplished by the following key groups and individuals:

- TVA Senior Sustainability Officer,
- TVA Environmental Sustainability Manager, and
- TVA Environmental and Energy Sustainability Committee.

These individuals will be supported by key areas of the TVA organization which are:

- TVA's Pollution Prevention and Waste Elimination Working Subcommittee and
- Operation Business Units.

The TVA Senior Sustainability Officer is responsible for reporting compliance metrics from the various environmental units. The responsible managers ensure that goals are set during the business planning process. They hold site management responsible for committing the necessary resources to achieve each sub-target and for reporting progress during business plan review meetings. The Environmental Sustainability Manager will review progress against these goals and the SSPP.

The following organizations will support them:

- **TVA Pollution Prevention and Waste Elimination Working Subcommittee**. Currently the Subcommittee is headed by Environment and Technology (E&T) - Business

Operations Support. The Subcommittee includes members from Environmental Policy, Clean and Renewable Energy, Supply Chain - Governance and Knowledge, Nuclear Operations Support; Environmental Permitting and Compliance, Environmental Science and Resources; and Fossil Generation, Development and Construction.

- **Operation Business Units** and their executive's support with needed resources, personnel, and training is crucial to reaching TVA goals. The Supply Chain organizations' support is crucial to reducing the purchase of certain materials, and to increasing the purchase of more sustainable products.

- **All Employees**. Meeting the Pollution Prevention and Waste Elimination goals will require an integrated effort by TVA employees at all levels and in all functional areas, particularly in regards to properly reusing, recycling, and diverting materials from the waste stream. Creating a culture around sustainability, including awareness around waste reduction, pollution prevention, recycling, and composting will be crucial as TVA continues to educate employees about their role in participating in these programs.

7.c. Implementation Methods: Summary

Waste Minimization and Reduction of Chemical Waste

The strategy and formal process for accomplishing the minimization and reduction of chemical waste will be the TVA Chemical Traffic Control (CTC) program. More specifically, the Chemical Traffic Control program will be standardized across TVA. This program will incorporate quarterly checks of chemicals in use and stored at each site/location.

Information Services has developed a Chemical Traffic Control Database for TVA's Sequoyah and Browns Ferry nuclear plants. These systems could be used at all TVA sites. To support the system, site coordinators will be needed on site. Next, CTC training would ensure that all personnel at the sites and purchasing card holders follow the approved CTC process. Additionally, TVA would base load each site's CTC database. Goals and reporting will conform with TVA EMS requirements.

Wood Waste Recycling and Reuse – Regional Pallet Grinding and Reuse Program

Wood waste is believed to make up a large percentage of construction, demolition and nonhazardous solid waste at TVA. TVA will develop a program to collect used pallets from all sites and bring them to a central location. At the central location, pallets will be cleaned of non-wood waste debris and then ground into mulch. Mulch will then be reused at TVA sites, provided to employees, or donated to local groups.

Diversion of 50% Non-Hazardous Solid Waste

While TVA currently has a solidly performing diversion program at the corporate locations, it needs to be improved to increase recycling diversion rates. Improving recycling at corporate sites will involve ongoing staff training and education, and possibly other methods to maintain performance gains.

TVA also needs to increase awareness and improve on the program at the remote, non-corporate sites. The remaining amount of waste to be diverted will have to be generated through

some rather new and challenging programs such as compost bins for food waste generated in office areas. Challenges include space constraints and health concerns.

TVA is considering the development of a “project box” available to each site management team that would creatively help with their waste reduction/reuse program. The project box would include an outline of how the program would work; a general idea of upfront and maintenance costs; labor involved; potential waste reduction/elimination amounts; a set of “defined needs;” and methods for obtaining funding. Outreach to site managers would encourage them to implement ideas in the ”project box.” A tracking mechanism would measure each site’s progress. Example ideas for the “project box” could include composting, pallet reuse, and recycling program, and reuse of structural items. The existing Corporate Recycling Team would be “re-chartered” to increase the diversion rates at the corporate locations as well as assist the site operations in establishing/revamping recycling programs.

Construction and Demolition Debris

Currently, TVA has a system to track all its solid waste. This system does not accurately divide solid waste into different waste streams. TVA will work toward putting a mechanism in place to track construction and demolition waste material and debris.

The Pollution Prevention and Waste Elimination Working Subcommittee will work closely with the Manager of Sustainability Design and Facilities Management architects and project managers to better quantify waste generated from construction. Construction waste management is part of sustainable design. Once tracking has been initiated, TVA will establish a baseline from which the 50 percent diversion will be achieved. In parallel with the baseline tracking, TVA will identify the types of waste streams and determine appropriate diversion strategies.

To accomplish this, TVA will need to: 1) Establish a program for formally tracking the construction and demolition waste generated at TVA sites. 2) Determine which organization will track the waste and train them on the appropriate system for tracking and reporting this waste. 3) Establish a baseline for construction and demolition waste generated against which the 50 percent diversion goal would be measured. 4) Identify other types of waste streams and determine which ones could be diverted and put a plan in place to start the diversion. 5) Place yearly goals on percent diversion to ensure TVA can reach 50 percent diversion by 2015. Goals and reporting will conform with TVA EMS requirements.

Reduce Printing Paper Use and Acquire Uncoated Paper with at least 30% PCW Fiber

TVA will reduce printing paper use by providing printers that are able to print double-sided documents. TVA will inventory all printers, including both networked printers and personal printers (used by only one person or a very small group of employees). During the inventory, TVA staff will note whether the printer has double-sided capacity or not. If not, the printer will be scheduled for replacement. All new printers will have double-sided capacity.

TVA will encourage staff to use electronic instead of printed documents for review.

TVA will acquire uncoated writing and printing paper with 30 percent postconsumer fiber by implementing control systems in the Supply Chain system. To achieve this goal, TVA will need to educate all buyers (including staff that use TVA credit cards to purchase supplies) on this requirement. To track progress, TVA will need to implement mechanisms in the Maximo system

to track paper purchasing, including tracking the dollar value and amount of the uncoated 30 percent postconsumer fiber paper purchased, as well as the dollar value and amount of other papers purchased.

Increase Diversion of Compostable and Organic Matter

In FY10, TVA will establish agency-wide and facility-specific baselines for this project. The strategy includes adding one cafeteria to the composting program each fiscal year so that all four TVA cafeterias will be diverting the compostable waste by the end of FY 2014. The achievements and quantities of compost and organic material diverted will be tracked as well as the progress toward the goal of expanding the number of cafeterias involved in each fiscal year.

As part of the business planning process, TVA will evaluate the feasibility of diverting compostable and organic material from its cafeterias in Chattanooga and Knoxville, TN. Goals and reporting will conform with TVA EMS requirements.

The Pollution Prevention and Waste Elimination Working Subcommittee will work with the TVA Facilities Management Program Manager of the Randolph-Sheppard Act to oversee the adaptation of possible compost diversion programs.

Implement Integrated Pest Management (IPM) and Appropriate Landscape Management Practices

TVA will continue to implement and refine methods that reduce the use of chemicals for pest management and weed control.

The TVA leveraged contract for pest control may go out for rebidding during FY 10 (contract is scheduled to end 2010 with a two-year extension option). When the contract is rebid, TVA will incorporate new language in the RFP requesting bidders to provide information about their IPM practices. TVA will also assign more weight to bidders that are more proactive in using IPM.

Decrease Use of Chemicals that Increase GHG Emissions

For this goal in FY10, TVA will establish agency-wide and facility-specific chemical usage baselines, based on age, condition, and criticality of equipment. Funding will be managed by those responsible for providing O&M budgets, building system enhancements, and/or capital funding of the larger equipment as they fail. The goal is to prohibit/restrict new purchase of R22 equipment unless approved gas manufactured equipment is unavailable and an approval process is followed.

TVA will implement this program through its work order system. Those completing work orders will enter data about refrigerant purchases or replacements by type, pounds, and tons of refrigerants on all equipment regardless of weight. In the current system, only amounts of 50 lbs. or more are tracked. Inventories could be managed by asset, condition and replacement of each facility and appropriate management.

No new positions are proposed to reach this sub-target as of this time.

7.d. Positions: Summary

TVA will need to add a total of 12.5 FTEs by 2012 to implement the Pollution Prevention and Waste Elimination projects. First, TVA will need to add four FTEs to implement the CTC program TVA wide. In addition, three FTEs will be needed to implement the Regional Wood Waste Collection and Grinding Program. Four FTEs will be necessary to improve recycling at non-corporate locations as well as half an FTE to administer tracking and trending of non-hazardous solid waste, and increase recycling at corporate locations. Finally, one FTE will be added to create a baseline and identify and develop new programs to divert C&D waste.

7.e. Planning Table: Summary

The following table presents a summary of the planning tables for each sub-target. More detailed discussion is provided for each sub-target below

Table 1: Planning Table Summary

Specific Sub-target	Units	Baseline	FY10	FY11	FY12	FY13	FY14	FY15
TOTAL LEVERAGED INVESTMENTS	$	NA	$	$	$	$	$	$
TOTAL INCREMENTAL INVESTMENTS	$	NA	5,000	944,000	1,108,000	1,573,000	1,499,000	1,599,000
Specific Subgoal	**Units**	**Baseline**	**FY10**	**FY11**	**FY12**	**FY13**	**FY14**	**FY15**
Initiate a formalized Chemical Traffic Control Program at all TVA facilities. Install CTC Software at each site/location	Number of CTC programs?	2	2	6	10	14	18	22
Leveraged Investment	$	NA	$	$	$	$	$	$
Incremental Investment	$	NA	0	640,000	460,000	560,000	660,000	760,000
Reduce wood waste going to landfills: Regional Collection and Grinding Program	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Leveraged Investment	$	NA	$	$	$	$	$	$
Incremental Investment	$	NA	$0	155,000	210,000	265,000	220,000	220,000
Increase diversion of nonhazardous solid waste - Track and trend nonhazardous solid waste and increase recycling at Corporate locations	Tons	546	546	600	700	850	1000	1266
Leveraged Investment	$	NA	$	$	$	$	$	$
Incremental Investment	$	NA	$5,000	24,000	43,000	43,000	19,000	19,000
Increase diversion of nonhazardous solid waste – Improve recycling at non-corporate locations	% Diverted	Unknown	TBD	10%	20%	30%	40%	50%

Specific Sub-target	Units	Baseline	FY10	FY11	FY12	FY13	FY14	FY15
Leveraged Investment	$	NA	$	$	$	$	$	$
Incremental Investment	$	NA	$	$60,000	$170,000	$340,000	$100,000	$100,000
Determine appropriate organization to track C&D waste, Establish a baseline value, and Implement programs to reach diversion goals.	% Diverted	Unknown	TBD	10%	20%	30%	40%	50%
Leveraged Investment	$	NA	$	$	$	$	$	$
Incremental Investment	$	NA	$	$50,000	$50,000	$50,000	$50,000	$50,000
Diversion of Compostable and Organic Wastes in Corporate Café Locations	Percentage diverted	0%	0%	25%	50%	70%	100%	100%
Leveraged Investment	$	NA	$0	$0	$0	$0	$0	$0
Incremental Investment	$	NA	$0	$5,000	$65,000	$65,000	$60,000	$60,000
Diversion of Compostable and Organic Wastes in Non-Corporate Locations	Percentage diverted	0%	0%	25%	50%	70%	100%	100%
Leveraged Investment	$	NA	$0	$0	$0	$0	$0	$0
Incremental Investment	$	NA	$0	$40,000	$110,000	$250,000	$390,000	$390,000

7.f. Agency Status: Summary

Waste Minimization and Reduction of Chemical Waste

TVA does not have a "formal" waste reduction program. Rather, TVA has implemented waste reduction primarily through source reduction. The original TVA focus was on the hazardous waste generated at facilities. A result of this decentralized program is that a large portion of the TVA sites are Conditionally Exempt Small Quantity Generators (CESQGs).

TVA currently does not have a "formal" Chemical Traffic Control program, though the Nuclear Power Group (NPG) does have a formalized program (SPP-5.4, Chemical Traffic Control). TVA's Environment and Technology organization has a draft procedure, "Hazardous Materials Management and Chemical Traffic Control," TVA-SPP-5.62. This procedure includes approved products/chemical inventory, chemical purchase requests, waste minimization plan, pesticides and herbicides, and toxics and chemicals reduction. It is scheduled to be released in May 2010. The new procedure is patterned after the NPG SPP-5.4 procedure but does not incorporate database requirements.

TVA's Sequoyah and Browns Ferry Nuclear Plants are incorporating a standardized Chemical Traffic Control System database. Information Services has developed and will maintain the database for both of these sites. By adopting this system at each site, TVA could have a standardized agency-wide program.

NPG has a Quarterly Chemical Traffic Control (CTC) Checklist: Sequoyah's is 0-PI-ENV-000-132.2. Each department at the site has a CTC coordinator who performs a chemical inventory for his/her department and documents that inventory on the checklist. This is an internal program that ensures that the health of the program is strong because the site chemicals are inventoried once a quarter.

TVA does not have agency-wide CTC tracking. NPG has a formalized CTC tracking program that is driven by procedures. The health of the program is measured by the quarterly CTC inventories that are performed.

Wood Waste Recycling and Reuse

Pallets are currently reused and recycled when possible, but some are also discarded in open-top "roll off" containers with other types of waste. Typically TVA generates industrial wood wastes such as: pallets, lumber, cable reels, crates, whole trees from electrical line construction, maintenance activities that generate pruned branches, stumps, and other wood debris from construction and demolition clearing and grubbing activities. TVA typically handles this waste stream on a site-by-site, state-by-state basis. Each state, city or county within the seven-state Tennessee Valley has different restrictions on "green" or natural wood waste. This could include burning bans, landfill restrictions, or other disposal concerns.

Divert 50% Non-Hazardous Solid Waste

TVA currently has a recycling program for various types of materials. A summary of waste generation and recycling programs is provided in the table below.

Summary of TVA Waste Generation and Recycling Rates, by Material

Waste Stream	Amounts Generated (Tons)	Subject to this goal?	% Diversion
Coal Combustion Products	5,293,199	No	29.12
Municipal Solid Waste	22,542	Yes	3[1]
MSW (Corporate Locations)	683	Yes	19.84[2]
MSW (Power Production Sites)	21,859	Yes	2.7[3]
Non-hazardous solid waste (sent to Sub C Landfill)	569	Yes	0
Scrap Metal	5,405	No	100
Electronics	56	No	100
Used Oil	411	No	100
Universal Waste	1.4	No	100
TSCA Waste	227	No	
Electrical Equipment Waste	81	No	
RCRA Waste	71	No	

[1]COC and KOC only

[2]Based on COC Recycling #s only

[3]Site diversion rate

TVA has always tried to reuse, where possible, or recycle materials of economic value from the waste stream rather than simply dispose. As evident from the table above, TVA has an active recycling program that is outside the normal range for businesses located in such remote areas as TVA. Also, as evident from Table 3, recycling at TVA varies by material and by location. These variations occur for numerous reasons. In some cases, markets are not available for recyclable materials, and waste removal vendors do not provide recycling services in many TVA remote sites. Some recycling programs at TVA need strengthening to increase diversion rates.

TVA tracks the amount of its municipal solid waste. The remote nature of many of TVA sites limits reuse and recycling possibilities. Diversion for recycling is not economically feasible and sometimes it is logistically impossible. As a result, 53 sites do not have an office waste recycling program. However, most of these sites recycle scrap metal and universal waste (batteries).

Divert 50% Construction and Demolition Debris

TVA currently does not have a formal tracking mechanism for construction and demolition materials and debris. Examples of the types of construction and demolition material and debris that TVA generates currently are: transmission poles from right of way maintenance, and concrete and wood from building demolitions. TVA currently diverts some of this material through giveaway programs but does not formally track results from these programs.

Reduce Printing Paper Use and Acquire Uncoated Paper with at least 30% PCW Fiber

Many new printers in use at TVA have double-sided capacity. The agency strongly discourages the use of personal printers and encourages the use of shared, networked printers, which reduces some paper usage. TVA currently has a system in place that automatically causes purchasers to purchase printing paper with 30 percent postconsumer fiber, even if the purchaser chooses a cheaper alternative, when the paper is purchased through the online procurement system.

TVA currently tracks paper by dollars spent total and dollars spent where the paper had recycled content. TVA contracts allow the purchase of three amounts of recycled content – 30 percent, 50 percent and 100 percent. The contract offers 20 types of paper, 17 with at least 30 percent recycled content. TVA does not track spending by amount of recycled content.

New systems need to be put in place to track progress towards these goals.

Increase Diversion of Compostable and Organic Matter

TVA has not had a "formal" compost recycling program from the corporate facility cafeterias. These cafeterias are privately owned businesses and operated under the Federal "Randolph-Sheppard Act 20 U.S.C. § 107 et seq." This Act gives priority to blind persons who want to operate the vending facilities on Federal property.

The State of Tennessee has a program for recycling waste oil into the production of biodiesel fuel. TVA currently recycles the waste oil from the cooking operations at these cafes. The oil is placed in a tote which is then transported to a facility for processing.

TVA has three cafeterias in Chattanooga and one cafeteria in Knoxville. TVA power generation sites are typically remotely located and have vending machines rather than onsite cafeterias making composting impractical and unfeasible economically.

Since this is a new endeavor for TVA, no baseline data exists for the amount of compostable material that would be generated.

Implement IPM and Appropriate Landscape Management Practices

TVA has two main programs that use pesticides and herbicides. The first eliminates the typical "pest" such as spiders, mice, ants, and bees, along with animals that are causing damage.

The second is the herbicide application program associated with the maintenance of the Right-of-Ways (ROWs). The ROWs must be maintained to ensure emergency and routine access to structures, switches, conductors, and communications equipment. In addition, adequate clearance, as specified by the National Electrical Safety Code and Federal Energy Regulatory Commission (FERC) must be maintained. While this program focuses on herbicide use, it includes an integrated vegetative management approach. These areas are maintained in the following priority manner:

- Low growing crops in farming,
- Wildlife food and cover for property owner,

- Mechanical mowing on dissected terrain with rolling hills and interspersed woodlands,

- Species-specific herbicides, and

- Hand clearing methods; alternately considering low volume herbicide applications, single tree injections, and tree growth regulators in place of the hand clearing.

For areas where herbicides must be used, there are three subsets of chemicals: The first set is used on TVA ROWs, the second are pre-emergent herbicides used on bare ground, and the third set is TGRs that may be used on tall trees, under specific growing conditions (e.g., fast growing species, difficult to prune, difficult to access).

Certified applicators use and apply herbicides in accordance with requirements from the label. Buffer zones protect wetlands and streams.

Decrease Use of Chemicals that Increase GHG Emissions

TVA has managed and/or reduced refrigerants and halon fire suppressant systems located in the office complex buildings located in Knoxville, Chattanooga, and Muscle Shoals. This was accomplished by conversion of approved gas, removal, and then storage of the gas in a refrigerant bank located in Muscle Shoals. In some cases, the gas was sent to other government agencies per the direction of a previous EO. A total of 19,370 lbs. of various GHGs were removed from TVA facilities:

Building	Gas	Pounds
Chattanooga Office Complex	R11	5070
Muscle Shoals	R11	1200
Muscle Shoals	R13	600
Knoxville Office Complex	R12	9200
Knoxville Office Complex	Halon 1301	300
Summer Place Building	R11	3600

Gases removed were stored in the refrigerant bank and available for any TVA organization with equipment using the above gases. These accomplishments were done in the FY93–FY01 timeframe.

GOAL 8: Sustainable Acquisition

In 2009, TVA purchased $3.1 billion of materials and services, excluding fuel; approximately $60 million of goods and services via over 900 TVA-issued credit cards; and issued 90,680 Purchase Orders for approximately 150,000 individual line items. These statistics illustrate that TVA has the opportunity and obligation to be environmentally and energy conscious in its selection and use of materials and services.

Sustainable Acquisition is the purchase of environmentally preferable materials and services in accordance with EOs, statutory requirements and agency goals. Proper attention to Sustainable Acquisition will:

- Demonstrate TVA commitment to environmental stewardship,
- Contribute to sound management of TVA financial resources and energy use,
- Reduce safety risks posed by the use of hazardous materials, and
- Support market development of green products and services.

8.a. Goal Description – Sustainable Acquisition

TVA will implement a Sustainable Acquisition system that will require all appropriate contractual actions to evaluate the use/purchase of items and services, which when evaluated against TVA performance requirements, will meet or exceed at least one of the following criteria:

- Energy Efficient (Energy Star, FEMP-designated, and low standby power devices),
- Water Efficient,
- Bio-based,
- Recycled-content,
- Environmentally Preferable Products/Services(excluding EPEAT), and
- SNAP/non-ozone depleting substances.

EO 13514 sets a goal that 95 percent of all new contract actions will meet these criteria. In addition, EO 13514 establishes a goal that TVA will update its affirmative procurement plans, policies and programs to ensure that all Federally-mandated designated products and services are included in all relevant acquisitions. Although EO 13514 is limited to procurements funded with appropriated funds and TVA's acquisitions are made with non-appropriated funds, TVA intends to implement the sustainable acquisition provisions of EO 13514 to the extent TVA deems practicable.

8.b. Agency Lead

The following individuals will serve as agency leads for implementing Sustainable Acquisition:

- TVA Senior Sustainability Officer,
- TVA Environmental Sustainability Manager,
- TVA Environmental and Energy Sustainability Committee, and
- TVA Sustainable Acquisition Working Subcommittee Lead.

These individuals will be supported by:

- The Sustainable Acquisition Working Subcommittee, which is described in greater detail under Implementation Methods.

- All TVA employees have a role to play in the successful implementation of Sustainable Acquisition. Sustainable Acquisition is not merely a "Supply Chain Issue." Incorporating Sustainable Acquisition into TVA processes will require early integration in planning and design efforts well before Supply Chain becomes involved, or sometimes even aware of, acquisition efforts.

II.8.c. Implementation Methods

Successful implementation of Sustainable Acquisition at TVA will depend on the support of the entire agency in four key areas: leadership; communication; training and awareness; and data management/tracking/reporting. The following methods, presented by sub-target, will be used to implement Sustainable Acquisition at TVA.

Sub-target a) Ensure that 95% of new contract actions that are amenable to Sustainable Acquisition standards, including task and delivery orders under new contracts and existing contracts, require the supply or use of products and services that are energy efficient (Energy Star or FEMP-designated), water efficient, bio-based, environmentally preferable[1] (excluding EPEAT-registered products), non-ozone depleting, contain recycled content, or are non-toxic or less toxic alternatives.

Leadership. Sustainable Acquisition leadership will be established and publicized for the following areas:

- Executive Management support. Management commitment of resources (staff and materials) will be paramount to the success of Sustainable Acquisition and will provide concrete evidence of management support.

- A re-formed Sustainable Acquisition (Green Purchasing) Working Subcommittee to include staff with budget responsibilities, staff from the Office of General Counsel, the Environment and Technology organization, members of the TVA Environmental and Energy Sustainability Team, members of the TVA SBUs, and staff from the Supply Chain and line organizations. The Subcommittee will have a dedicated manager and staff to oversee promotion and training efforts, trouble-shoot, and correct problems within the program, revamp the Green Product Matrix, and monitor and track program implementation.

Communication. To communicate both the importance and the requirements of Sustainable Acquisition, TVA will:

- Incorporate "Sustainable Acquisition" into the Agency Integrated Performance Management System to ensure emphasis at all levels in the agency.

- Promote the program to TVA employees and the public to promote interest and knowledge. Internal program communications will extend into the Personal Sustainability arena as well, as described in Goal 10 Innovations, by promoting the use of green/environmentally products in employee personal life.

Training and Awareness. To train key members of the agency population on the requirements of Sustainable Acquisition, and to increase awareness of the program for all agency staff and the supply chain, TVA will:

- Revamp its Green Product Matrix, which is a listing of routine products that TVA procures with corresponding green procurement criteria and is organized by TVA-friendly nomenclature. The revamping will make the Matrix more user-friendly, identify new products, and incorporate life cycle costs analyses.

- Upgrade its training program to emphasize program requirements, and to provide compelling case studies to illustrate long-term benefits and simple life cycle cost examples. Training will be provided routinely. TVA staff involved in the procurement process will be identified and required to complete the training course. At a minimum the target audience for training will include those who write equipment/material specifications, Technical Contract Managers (TCMs), purchasing managers/agents, purchasing card users and project managers.

- Where appropriate, incorporate Sustainable Acquisition contract language into the Terms and Conditions of new TVA contracts by the end of FY2010.

- Work with suppliers to solicit recommendations for green substitutes in existing contracts and for automated purchase items.

- Where appropriate, incorporate green criteria into contract selection metrics.

Data Management, Tracking, and Reporting. To track and monitor the progress of Sustainable Acquisition implementation, TVA will:

- Use data collected in MAXIMO (for contractual purchases). This effort will customize required green procurement fields in MAXIMO to ensure that users address sustainable acquisition early in the acquisition process. The updated Green Product Matrix will allow accurate coding in MAXIMO.

- Develop other techniques/systems to monitor credit card and automated purchases, which are not captured in MAXIMO.

- Coordinate data collection efforts with the Pollution Prevention & Waste Elimination and Electronics Stewardship Working Subcommittees. Their respective initiatives address procurement of materials that are recyclable and therefore reduce TVA waste generation while simultaneously increasing the TVA recycling rate. The Electronics Stewardship Committee's procurement program also addresses energy consumption via the selection of energy efficient products. Both are discussed in greater detail under Goals 7 and 9, respectively.

- Develop an Annual Sustainable Acquisition Report aligned to the requirements of the EO 13514. Goals which have been included in the Environmental Management System will be monitored for progress and addressed in the annual report as well.

Sub-target b) Update agency affirmative procurement plans (also known as green purchasing plans or environmentally preferable purchasing plans), policies and programs to ensure that all

designated products and services which TVA is mandated to select under Federal law are included in all relevant acquisitions.

TVA will revise its Green Procurement Plan to address the requirements of EO 13514. This revision will address the details of Sustainable Acquisition implementation, including new resources required, the re-formation of the Sustainable Acquisition Working Subcommittee, training requirements, updating of the Green Products Matrix, and data management/tracking techniques.

8.d. Positions

At present the agency has a Green Procurement Team that meets periodically, but has no dedicated manager or resources except for required training time by Technical Contract Managers (TCMs). Well over 100 staff members currently are involved in the supply chain for TVA, including line staff for each plant and office complex. The new Sustainable Acquisition Working Subcommittee will take the lead to improve the program at TVA. Although EO 13514 is limited to procurements made with appropriated funds and TVA's Supply Chain organization is funded with non-appropriated dollars, TVA will attempt to provide staffing for the sustainable acquisition initiative to the extent TVA deems practicable.

To fully implement Sustainable Acquisition at TVA, current staff time will be leveraged by incorporating Sustainable Acquisition into their routine duties. TVA will also, as an incremental investment, reassign staff to support Sustainable Acquisition. In addition, TVA will establish two new full time intern/co-op positions to support implementation of the program.

Current TVA Contract Managers and Procurement Agents staff time will be leveraged to support the program by participating in enhanced training, incorporating standardized contract language, and properly coding contract actions. In addition, current line organization staff will be contributing via participation on the Sustainable Acquisition Working Subcommittee and supporting the Green Products matrix revamping described in the Implementation Methods. One full-time TVA manager will be assigned to oversee implementation of the Sustainable Acquisition program, and will be supported by one full-time clerical staff member, two full-time interns/co-ops, and a portion of two TVA technical staff members' time to contribute to the achievement of Pollution Prevention/Waste Elimination and Electronics Stewardship initiatives. The interns/co-ops will be responsible for product substitution research and lifecycle analyses to support both the Green Matrix revamping and non-routine purchasing actions. TVA staff with training expertise will partner with Sustainable Acquisition and the TVA Sustainable Acquisition Manager to enhance training content and delivery. TVA staff and contractors with MAXIMO expertise will implement necessary customization and enhancement efforts to support tracking and reporting efforts.

8.e. Planning Table

The table below presents a summary of the Sustainable Acquisition sub-goals and the investments needed to implement these sub-goals. TVA is addressing all sustainable acquisition criteria collectively and as such has not established individual targets.

SUSTAINABLE ACQUISITION	Units	FY 10	FY 11	FY 12	….	FY 20
New Contract Actions Meeting Sustainable Acquisition Requirements	%	-	95	hold	hold	hold
Energy Efficient Products (Energy Star, FEMP-designated, and low standby power devices)	%	-	95	hold	hold	hold
Water Efficient Products	%	-	95	hold	hold	hold
Bio-based Products	%	-	95	hold	hold	hold
Recycled Content Products	%	-	95	hold	hold	hold
Environmentally Preferable Products/Services (excluding EPEAT)	%	-	95	hold	hold	hold
SNAP/non-ozone depleting substances	%	-	95	hold	hold	hold
Other, as defined by agency						
Leveraged Investment (funded through annually recurring existing budget items, such as capital improvement, O&M, etc. or ARRA)	$ M	0.400	0.500	0.500		
Incremental Investment (funded through new program budget requests specific to this EO)	$ M	0.120	0.961	0.876		
Alternative Investment (funded through ESPC, UESC, EUL, PPA, rebates, or other funding assistance)	$ M	-	-	-		

8.f. Agency Status

TVA has a Green Procurement Plan (TVA-SPP-4.1) which was established in 2007 in response to several federal actions including EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*; the Energy Independence and Security Act of 2007 (EISA07); the Federal Electronics Challenge; Resource Conservation and Recovery Act, Section 6002; the Farm Security and Rural Investment Act of 2002; the Energy Policy Act of 2005 (EPAct05); and EO13221, *Energy Efficient Standby Power devices*. To support the Green Procurement Plan TVA developed an online training program which is required training for Technical Contract Managers and Procurement Managers/Agents. During the most recent "data call" at least 10 contracts were identified that allowed the procurement of materials with recycled content (30% post consumer paper), recyclable printer cartridges or were energy efficient (primarily IT equipment). Other materials that are considered green are also purchased, but in a manner that is more difficult to track within the TVA system at present.

TVA began using MAXIMO in 2009. MAXIMO has been customized to allow purchase and tracking of materials/services that are included in the EO requirement. The possible selections are shown below:

- Item contains recycled content,
- Item complies with Energy Star requirements,
- Item complies with low standby power requirements,
- Item contains bio-based content,
- Item is an environmentally preferred product,
- Green requirements apply but are not followed because of cost,
- Green requirements apply but are not followed because of availability,
- Green requirements are not applicable to this item, and
- Item has not been reviewed for Green requirements.

GOAL 9: Electronic Stewardship and Data Centers

9.a. Goal Description

TVA has positioned itself to play a vital role in waste minimization, electronics, and e-waste recycling, and pollution abatement through best management practices in electronics stewardship. Energy reduction at the IT equipment level has the greatest effect on system-wide energy consumption because it cascades throughout all supporting systems.

Considering that the current estimated annual power consumption baseline for all of the 16,000 TVA personal computers is 7900 MWh, by implementing Enterprise Power Management alone, TVA is projected to save 4700 MWh (more than $288,000 annually) which is nearly 60% of the energy baseline.

According to the EPA's recent report entitled *Municipal Solid Waste Generation, Recycling, and Disposal in the United States Detailed Tables and Figures for 2008*, only 430,000 tons (13.6%) of the estimated 3.2 million tons (86.4%) of electronic waste generated in the United States is recovered or recycled. TVA has integrated Best Management approaches to address this alarming trend through environmentally sound management practices for electronics disposition. Maximizing electronics product life cycle enhances mitigates environmental impacts through minimizing the amount of functioning equipment units in the waste stream, increased recycling rates, and reduced energy consumption. TVA has met or exceeded the electronics stewardship goals set forth in EO 13423, and is positioned to meet the goals of EO 13514. In terms of Green Product Purchases, 99% of all electronics purchases are EPEAT certified. In addition TVA has initiated its Advanced Power PC Management Program which is slated for completion at the end of CY2010. TVA follows Environmentally Sound Management Practices at End-of-Life via recycling or donating 100 percent of its computer-related electronics equipment.

Energy use in data centers has a significant portion of TVA's energy use footprint. Increased use of software applications and agency virtual communication has increased activity. The increase in overall power consumption was only 5 to 8 percent associated with power use per unit. A spike in the volume of servers in data centers is accountable for 90 percent of the growth in power consumption for most industries. Thus, the TVA's efforts to consolidate servers and to virtualize applications (i.e., combine applications onto idle servers) will save the agency energy in server use, as well as the cooling associated with data centers.

TVA has focused on improving efficiency and performance in corporate Data Centers. Activities in the Chattanooga Data Center including health checks, installation of standard data center tools and standard server racks, cable management, air flow analysis, new Computer Room Air Conditioning (CRAC) units, hot air return/plenum, and improved Data Center design.

EO 13514 addresses five goal areas for Electronics Stewardship and Data Centers areas as follows:

- Implementation of guidance and policy to ensure the use energy efficient and/or environmentally preferred options and features on eligible agency electronic products to include power management and duplex printing,
- Promotion of sound practices for disposition of agency electronic products,
- Implementation of strategies to increase the quantity of electronics disposed of in an environmentally sound manner,
- Implementation of best management practices for energy efficiency and improved management of servers and data centers, and
- Reduction of technology energy consumption in data centers.

To achieve these goals, the EO encourages TVA to increase performance in the following target areas:

- Percent of device types covered by current Energy Star specifications that must be Energy-Star qualified,
- Percent of electronic assets covered by sound disposition practices,
- Percent of cloud activity hosted in a data center,
- Percent of agency data centers independently metered or advanced metered and monitored on a weekly basis,
- Reduction in the number of agency data centers,
- Percent of agency, eligible electronic products with power management and other energy-environmentally preferable features (duplexing) actively implemented and in use,
- Percent of agency data centers operating at a PUE range of 1.3-1.6,

8. Percent of agency data centers operating with an average CPU utilization of 60-70 percent,

9. Percent of covered electronic product acquisitions that are EPEAT-registered, and

10. Percent of agency data center activity implemented via virtualization.

TVA has initiated IT improvements that address a number of these targets prior to issuance of the current EO; therefore, TVA will be able to meet or exceed many of the performance targets in FY 2010. For other targets, TVA will be able to implement integrated and measured IT policy changes make and innovations pending confirmation of planned resources

9.b. Agency Lead for Goal

Implementation of Electronic Stewardship and Data Centers at TVA will be accomplished by the following key staff:

- TVA Senior Sustainability Officer,
- TVA Chief Information Officer,
- Manager of IT Engineering Design,
- Engineering Support Manager,
- Infrastructure Operations, and
- Manager, Enterprise IT Asset Management.

These individuals will be supported by:

- **TVA Information Systems (I.S.) Team**. The I.S. team, reporting to the CIO, is critical for managing data center architecture, operations and maintenance including power metering, electronics asset management/disposition, power management policies, output devices (printers/copiers) acquisitions, settings, and disposition.

- **All Employees**. Even though IT equipment is issued by the IS team and power management can be controlled centrally, employees play a vital role in conserving energy and material resources. Employees currently have the ability to override duplex printing and use single sided copying. Employees can choose to accept or ignore PC sleep mode and shutdown instructions. Employee engagement is essential to overall energy savings.

9.c. Implementation Methods

To achieve a high percentage of device types covered by current Energy Star specs that must be Energy-star qualified and a high percentage of covered electronic product acquisitions that are EPEAT-registered, TVA will continue acquisition of Energy Star-qualified and EPEAT-registered electronics for device types used at TVA. Specifically, for each type of device at TVA that has Energy star qualified models, the I.S. Team collaborates with the TVA Sustainable Acquisitions Team to keep Energy Star specifications and EPEAT-registered brands in future procurement requests. One option planned is to convert to 'active state' PC energy efficiency models only for all future acquisitions as currently, TVA procures the "sleep and idle" state PCs. The I.S. staff will highlight the importance of IT energy consumption and conservation through employee education about estimated energy savings using Energy Star-rated new electronic equipment and leverage the Climate Savers Computing Initiative's educational materials.

To increase the percentage of electronic assets covered by sound disposition practices, TVA balances the cost of new technology and disposal with the gains in performance and energy savings. The I.S. team will use the established PC refresh or replacement schedule established for different device types (desktops laptops, monitors, printers). Currently, TVA disposes of end-of-life electronics through a combination of redeployment of PCs within TVA, donations to schools, resale, and electronics recycling using a Department of Energy contract. To ensure that these disposal practices are sound and to reduce the human and financial resources involved in e-waste management, TVA will audit its donation, resale, and e-recycling partners to minimize risks. TVA will also consider outsourcing the entire electronics disposition program to ensure proper data destruction and e-waste management. TVA will also consider asset management services bundled with electronics procurement (lease or purchase).

To address the EOs suggested best practices for the efficient energy management of data centers, TVA will consolidate data centers, computer rooms, and virtualize applications where practical. Virtualization in years 2006-2009 resulted in a 6 to 1 virtual to physical server ratio in the Chattanooga location; 11 to 1 in Browns Ferry Nuclear facility; and 4 to 1 in 11 Regional sites.

TVA also plans to hire a Green IT Sustainability Architect to identify additional virtualization opportunities.

To achieve a Power Usage Effectiveness (PUE) range of 1.3-1.6, TVA plans to individually meter data centers aside from overall facility energy usage in FY 2011. Until then, TVA will use modeled energy consumption data. After a measured baseline is established, TVA will revaluate data center configuration to reduce energy consumption to achieve a PUE range of 1.3-1.6.

The EO calls for an agency to have eligible electronic products with power management and other energy-environmentally preferable features (duplexing) actively implemented and in use. To reduce personal computer power usage across the Agency, TVA plans to complete implementation of the Advanced PC Power Management project by the planned date of December 2010. In addition, TVA will use an automated reporting and auditing system to monitor power usage in specific departments and locations across TVA and, communicate success stories of power management. TVA will communicate these best practices to employees, the power industry, and local community. Weekend power savings per capita power savings in energy units and dollars saved reinforced the right actions for the Agency.

TVA can reduce printing associated with financial, communication, and other administrative uses by monitoring printing volume and duplex printing at Consolidated Output Device centers. Methods may include:

- User surveys and paper usages per center or per capita,
- An Agency-wide mandate (not merely default) for duplex printing, and
- Working with the Sustainable Acquisitions Working Subcommittee to identify off-site printers using recycled fiber content, soy inks, and digital/remote print processes for large or unusual print jobs, and,
- Encouraging web-based communication, make available shared documents (e.g., SharePoint).

9.d. Positions

The TVA I.S. team currently is using 10 to 25 percent of seven different positions. This is equal to 0.6 FTE in FY 2010 and one FTE in FY 2011 and FY2012 for all sub-goals mentioned in Goal 9. The I.S. team will fill a new position -- a green IT sustainability architect – in FY 2011. Many of the electronics stewardship efforts as well as data center improvements initiated in FY 2010 or earlier were undertaken for the benefit of using new technology and easing operations for both users and IT staff. As such, with the exception of hiring a new green IT sustainability architect, projects underway and proposed will use leveraged resources.

9.e. Planning Table

ELECTRONIC STEWARDSHIP and DATA CENTERS	Units	FY 10	FY11	FY12	FY13
% of device types covered by current Energy Star specifications that must be energy-star qualified	%	90	95	95	hold
% of cloud activity hosted in a data center	%	0	Pilot 30	60	hold
% of agency data centers independently metered or advanced metered and monitored on a weekly basis	%	100	90	100	hold
Reduction in the number of agency data centers					hold
% of agency, eligible electronic products with power management and other energy-environmentally preferable features (duplexing) actively implemented and in use	%	55*	95	95	hold
% of agency data centers operating at a PUE range of 1.3-1.6	%	0	25	50	hold
% of covered electronic product acquisitions that are EPEAT-registered	%	96	96	96	Hold
% of agency data center activity implemented via virtualization	%	40	40	40	hold
Other, as defined by agency					
Leverage investment (funded through annually recurring exit budget items, such as capital improvement, O&M, etc. or ARRA)	$M	0..482	0.383	0.371	hold
Incremental investment (funded through new program budget requests specific to the EO)	$M	.040	2.11	2.11	hold
Alternative investment (funded through ESPC, UESC, EUL, EPA, rebates, or other funding assistance)	$M	00	00	00	hold

*Not all PCs are power managed. TVA is executing a project that will have the remaining PCs on PC power management by Dec. 31, 2010.

9.f. Status

(1) TVA is implementing some very contemporary IT enhancements that improve not only operations and costs, but also energy efficiency. Device types covered by current Energy Star specs that must be Energy-star qualified include desktop computers, laptop computers, and monitors. TVA has been using Energy Star criteria for procurement since 2003; all new IT purchases or leases are Energy-Star qualified. Additionally, TVA standard monitors have been exclusively LCD panels – 60-80% more energy efficient than older CRT technology – since 2005. The remaining standard legacy CRT monitors are projected to be retired by FY 2012.

(2) Since July 2008, TVA has purchased 98 percent-plus EPEAT-registered items for covered electronic product acquisitions.

(3) Currently 99% of all PCs are diverted from landfill. Data is wiped off PCs in-house, PC and printers are resold, donated to community-based organizations, or recycled by a DOE contractor, 5R Processors, to handle the electronics. Three to four percent are donated (using 17,000 as the total number of PC's), 5 to 8 percent are sold, and 88 to 92 percent recycled. TVA attempts to get as much use as possible, so re-use and re-distribution which result in TVA re-cycling, are considerably higher than donations and sales.

(4) The stated EO virtualization goal in FY 11 is 30 percent. Current server virtualization is a little more than 45%. Virtualization project begun in 2009 produced an average of 4:1 ratio (virtualized machines to physical servers. In Chattanooga office Complex, the largest data center with 72 servers, the virtualization ratio was 6:1. Recent server virtualization is more than 45 percent, exceeding the EO goal of 30 percent in FY 11. Continue to do server virtualization to achieve 50 percent virtualization by FY 12. The FY 12 goal is 40 percent, and hold in FY 13.

(5) TVA has two data centers, Chattanooga has a modeled PUE of 1.9 and Knoxville has a modeled PUE of 1.92. Driving these numbers down to the target 1.3-1.6 PUE range requires more energy efficiency or lower energy consumption by the data center portion of a facility. The FY11 goal is 90 percent of data centers metered and monitored on a weekly basis, FY 12 goal is 100 percent.

(6) In 2009, TVA began rolling out Output Device Management throughout the Agency, business unit by business unit. The goal is to reduce the number and model types of output devices, namely printers, copiers, fax machines, and scanners. By no longer supporting personal printers in individuals' offices, by reducing the variety of output devices from 600 models to 10 models, and by limiting output device stations to one per floor or one per department, TVA is reducing paper waste, cartridge waste, and personnel hours servicing individual devices. The best management practices include: use of Energy Star output devices (printer, copier, fax, scanner all in ones), default duplex printing, standard device configurations, standard lifecycle guidelines, and "Think before You Print" guidelines of "duplex printing, print preview, standard monochrome print." Recording energy and paper savings are planned.

GOAL 10: Agency Innovation

10.a. Goal Description

There is great pride among TVA employees that environmental stewardship has been central to its mission from its inception under the TVA Act in 1933. Over the years, and with the evolving understanding of the times, TVA has fostered the care of the Tennessee River Basin and its bounteous natural resources. The inclusion of the environment in the TVA mission has long driven the agency to invest in innovative practices that improve environmental performance and promote sustainability.

In today's TVA culture as well, there is a reservoir of commitment to the well-being of both the natural systems and human populations of the Tennessee Valley. This commitment is reflected in the enthusiastic response to the challenge issued by the TVA Board of Directors and management for TVA to take a leadership position in sustainability among both federal agencies and in the electric utility industry.

10.b. Agency Lead

The agency lead for the innovation goal is the Environmental Sustainability Manager, who oversees the TVA Environmental Sustainability Business Unit.

II.10.c. Implementation Methods

TVA is implementing a system-wide reorganization designed to position TVA for the 21st century. One of the principles of this reorganization is sustainability and will be, simply, the way we do business at TVA.

TVA maintains a sophisticated strategic planning cycle in which operating units coordinate annual Business Plans with the overall TVA Strategic Plan. Goals from the Sustainability Plan are being incorporated into all plans. With the realignment of a comprehensive EMS system last year, sustainability metrics will be developed and tracked for all Business Plans through the TVA EMS.

Another cornerstone is to inform and support the new TVA direction through employee involvement at all levels. Employees at TVA have already succeeded in leading employee-generated initiatives. For example:

- At the TVA Paradise Plant in 2009, an employee engagement process generated over 1300 ideas for improvements, a number of which were related to sustainable practices. One such project involved the removal of debris from ductwork, saving an estimated $26 million to date largely through reducing raw materials use and energy costs.

- Employees at the Cumberland Plant located in rural Cumberland, TN have started a comprehensive recycling program. With financial support from the plant management, Cumberland employees have collaborated with local citizens to develop sources for recyclables including wooden pallets that were previously burned.

Following best practices in organizational innovation, more TVA employees will be given the opportunity to propose sustainability projects via an innovations process. TVA has had in place a number of employee-driven teams to accomplish organizational goals, such as our current diversity initiative and Organizational Effectiveness Initiative (OEI).

Using these existing structures, TVA is launching a Sustainability Innovation system. Support staff in the newly formed TVA Environmental Sustainability Business Unit will be charged with encouraging and supporting promising sustainability projects, including the potential for start-up funding. Employees will be recognized and rewarded for innovative ideas, and the Environmental Sustainability Staff will ensure that the successes and lessons learned are communicated throughout the organization so other facilities and departments can easily replicate successes.

TVA is also reviewing OEI projects underway as a part of our reorganization to ensure that sustainability is incorporated into their deliberations and outcomes. For example, sustainability was included in the charge to the OEI team that reviewed our supply chain. TVA is also designing an employee engagement project to invite employees involved in procurement to contribute their best thinking about how to enhance the TVA environmental footprint through greener purchasing decisions. Through a series of TVA Community Conversations, TVA will capture the most promising ideas, share them across the organization, and motivate employees to take ownership of an ongoing process of greening our supply chain.

10.d. Positions

For FY 2010 and FY 2011, TVA anticipates that it is adequately staffed to develop and implement a Sustainability Innovation Program. Initially, the majority of work to support this system and innovative programs already underway will be completed by at least one full-time position and as a portion of other full-time employees' regular job duties. As new innovations are identified and selected for implementation, TVA will reassess staffing needs, which may result in an increase of part-time staff or FTEs as necessary. The agency has no concerns regarding staffing in relation to this goal area.

Additionally, employees and managers already on board at TVA have formed a cross-functional and geographically diverse group to plan, execute, publicize, and report successes about innovations across the Agency. Development of a Business Unit with a position that will be responsible for innovations work and coordination is underway. Furthermore, the development and implementation of various innovations will also be shouldered by people across the Agency to address opportunities and needs.

10.e. Planning Table

AGENCY INNOVATION	Units	FY 10	FY 11	FY 12	….	FY 20
Other, as defined by agency				x	x	x
Leveraged Investment (funded through annually recurring existing budget items, such as capital improvement, O&M, etc. or ARRA)	$ M	0.230	0.235	0.235	x	x
Incremental Investment (funded through new program budget requests specific to this EO)	$ M	0	0.060	0.120	x	x
Alternative Investment (funded through ESPC, UESC, EUL, PPA, rebates, or other funding assistance)	$ M	0	0	x	x	x

10.f. Agency Status

TVA recognizes that this challenge requires not only commitment, but creativity and innovation as well. Sustainability is an evolving process best supported by an educated, involved workforce, with innovation a cultural value and systems in place to promote it. To that end, in addition to the measures described previously in this Plan, TVA currently employs multiple innovative practices, technologies, and techniques to achieve sustainability goals. A more comprehensive catalogue of TVA innovations is attached as Exhibit 10-1. Several examples of these practices are highlighted below.

- The flagship of the TVA innovative practices is the agency's Personal Sustainability Program, launched on Earth Day, April 22, 2010. The program, which engages and empowers employees to weave sustainability into their personal lives on a meaningful basis, focuses on four key areas--health, efficiency, community, and environment. Through the program, employees are encouraged to maintain their own health, work to ensure that the Tennessee Valley is a healthy place, make more efficient use of water and energy, give back to their community, and preserve the region's environment and natural beauty.

- Another noteworthy innovation is the TVA Environmental Utility Benchmarking Forum, a utility industry benchmarking forum organized and hosted on May 12 - 13, 2010. The forum brought together representatives from 16 electric utilities from across the country to provide an opportunity for the industry participants to share environmental performance data and best practices in performance reporting.

- To promote transparency and ensure clear communication of environmental performance to stakeholders, TVA has committed to developing an environmental footprint. The TVA Environmental Footprint identifies Environmental Performance Metrics that capture the spectrum of responsibilities in the TVA Environmental Policy aligned with the Global Reporting Initiative Framework for Sustainability Reporting. Using these metrics, benchmark data has been compiled for other electric utilities to identify performance rankings in key environmental areas and to identify areas for improvement and priorities for environmental performance.

- Since 2003, the agency has operated "Growth Readiness," a program using collaborative planning methods to help communities within its service area create smart growth policies around water use and to support sustainable development. Through this program 230

communities have evaluated their codes and ordinances against model principles. Average initial scores were 39 out of 100 points, indicating 'serious reform needed'.

After checking back with these programs five years later, 123 of these communities report that they have made, or plan to make changes to achieve more quality growth will result in scores increasing by 41 percent to 54.6. In addition, communities report the use of best practices promoted by the program in 57 projects including pervious pavement, preserved open space, grassy swales, and bioretention and rain gardens across the TVA region.

TVA has worked with key partners including EPA Region IV, EPA Office of Smart Growth and the Southeast Watershed Forum to develop a new Quality Growth Worksheet, training curriculum and workshop series to address environmental concerns in a wider set of Smart Growth issues.

- The Technology Innovation group within the TVA Environment and Technology business unit is responsible for developing and managing the TVA strategic research and development (R&D) portfolio. The Technology Innovation groups evaluate and demonstrate energy efficiency technologies for consumers; applications of smart grid for power delivery; clean technology programs including biomass, solar technology, wind power, and waste technologies; and evaluate ways to prevent harmful impacts to the environment by developing and implementing generation control technologies.

  Strategic research is focused in key areas of clean energy technology, energy efficiency and smart grid, electric transportation, environment and generation, and by leveraging research through partnerships with external stakeholders and prestigious research institutes.

  Clean Energy Technology (CET) is responsible for evaluating and developing sustainable, non- and low-carbon emitting power generation technologies that support TVA's strategic goals for clean energy reduce TVA's overall environmental footprint and result in new clean generation in the Valley. CET demonstrates new clean technologies and conducts innovative research that addresses performance, cost, sustainability, and availability issues associated with clean energy technologies. CET also engages the external engineering and scientific communities for collaborative research in clean energy technologies.

  Biomass: Renewable portfolio standards (RPSs) and GHG emission regulations are driving the growth of biomass-based electricity generation as well as other renewable energy requirements. Renewable energy sources such biomass have the potential to greatly reduce GHG emissions. TVA is currently researching and investigating biomass feed stocks sources such as wood, plants, and agriculture residues along with emerging preparation technologies that provide increased heat input. The potential for incorporating these valuable carbon neutral fuels as co-firing with coal supports TVA goals for increased power generation from renewable energy sources.

  Waste Heat Assessment: Within the TVA service territory many distributor and direct serve customer production processes generate waste heat. Reclaiming this production byproduct can increase production efficiency, reduce load demand, and provide clean peak power generation to the grid. Within TVA several internal programs such as Valley Investment Initiative, Generation Partners, Major Industrial Program and Energy Efficiency, and the Dispersed Power Program are individually offering specific education and incentives to industrial customers for energy efficiency improvements, load reductions, and peak power

generation. The CET group has completed a comprehensive identification and documentation of Valley waste heat sources for clean energy generation.

Integration of renewable energy to augment fossil generation: With emphasis on using renewable energy sources, carbon credits, the rising cost of fossil fuels, and their impact on the environment, there is interest in exploring the feasibility of using solar energy to augment fossil fuel consumption at an existing power plant in a cost-effective manner. The TI group is interested in determining the potential benefits and feasibility of utilizing solar energy to augment the energy requirements of their fossil fuel power plants. Successfully employing a renewable energy source such as solar can reduce fossil fuel consumption and lessen plant emissions. In 2010, the CET completed an evaluation of fossil fleet and selected Colbert Fossil Plant as the study site for the solar thermal power/fossil plant integration feasibility study.

The Energy Efficiency and Power Delivery Utilization group (EE&PDU) focuses on the deployment of multiple high-efficiency technologies in consumer facilities to evaluate energy savings potential and future consideration for TVA marketing initiatives and development of smart grid technology.

Energy efficiency research focuses on developing cost-effective residential energy efficiency and demand-response tools to educate builders, developers and consumers. “Demand response” refers to approaches that encourage consumers to reduce their energy use during periods of peak demand. TVA has built three experimental homes at Campbell Creek and will use them over the next few years to evaluate residential building techniques, energy efficiency technologies, smart grid concepts and consumer energy-use behaviors. The Campbell Creek research project is a unique test facility that will enable TVA and its partners, Oak Ridge National Laboratory (ORNL) and EPRI, to evaluate the effectiveness of residential construction and efficiency technologies in a controlled environment. During 2010, the Energy Efficiency and Power Delivery Utilization (EE &PDU) group from Technology Innovation completed first year of testing and documentation of energy savings for residential energy efficiency technologies at the Campbell Creek research facility. TI is also participating in the National Energy Efficiency Demonstration.

Technology Innovation, EE&PDU is developing a Smart Grid deployment plan for the Tennessee Valley that will lead to characterization of important applications for the transmission, distribution, and consumer systems; enable a better understanding of the cost/benefit of such applications; and resolve questions in terms of technology integration and interoperability between operations and end devices. A component of the deployment plan is demonstration of key applications, such as: wide-area visualization of power system assets and operating conditions, more efficient use of existing transmission corridors, integration of renewable/ storage technologies, smart asset management using advanced sensing devices, and engagement of end use consumers in energy efficiency and demand response.

The Environment and Generation group is responsible for innovative, cost-effective technologies that mitigate the impact of TVA’s generation and meet compliance. Research under this area includes generation control technologies for mercury, mitigation of environmental impacts from wet to dry coal combustion byproducts, the development of passive waste water treatment technologies, and the evaluation of carbon capture technologies and storage opportunities for the TVA fossil fleet. Technology Innovation, in cooperation with other organizations within TVA’s Environment & Technology business unit,

is conducting a small-scale, terrestrial carbon sequestration pilot-project in the Tennessee Valley. The purpose of the project is to generate certified and fungible above and below ground carbon credits, but more importantly, to develop a working knowledge and internal expertise that can be applied to similar, but larger-scale, greenhouse gas emissions offsets projects in the future. Environmental stewardship will be an integral part of this project. Mixed vegetation (trees, native warm season grasses, and legumes) as opposed to a monoculture, will be used support biodiversity and provide habitat for wildlife.

Electric Transportation and Infrastructure. Anticipation is increasing that electric vehicles will soon be entering the public and private sectors. The increased use of electricity as a transportation fuel requires effective integration of charging stations with the power grid. TVA is supporting the development of solar-assisted stations to increase the use of renewable energy in the Valley; provide electric vehicle owners with a greener charging option; reduce the likelihood of negative impacts from charging vehicles during periods of peak power demand; defer costly system upgrades; and support system reliability. TVA is partnering with Nissan North America, the state of Tennessee, and the Electric Transportation Engineering Corporation (eTec). Together, with regional power distributors, TVA is developing the plan to deploy electric vehicle charging infrastructure to support the Tennessee launch of the Nissan LEAF, a battery electric vehicle in late 2010. Part of a larger national research demonstration that covers five geographically and socioeconomically diverse locations, Tennessee will showcase Chattanooga, Knoxville and Nashville in the largest electric vehicle project of all time.

TVA is also engaged in non-road transportation technology research. One of the benefits of electricity as a transportation fuel is the reduction in greenhouse gases over petroleum fuels. A critical aspect of our work is to assess these emissions reductions. One way TVA is working to achieve this goal is looking at the total footprint of individual systems, like in the utility or air cargo sectors, and developing options through research to reduce environmental footprints through transportation electrification.

The science and technology problems facing the utility industry today and projected for the future are complex, with technical, social, and economic implications for the industry and the country. Because of the size and complexity of such problems, solving them is expensive and requires experts in both practical application and technology innovation. Partnerships provide TVA opportunities to access each organization's unique capabilities and expertise to meet TVA's near- and long-term needs for science and technology. The R&D philosophy will remain centered on marshalling the science and technology from the best available sources to enhance scientific and technical basis for TVA decisions and applications.

The Technology Partnerships group promotes environmental stewardship and economic development in the Tennessee Valley by including, collaborating, and educating stakeholders. TI manages external partnerships with other leading research organizations to assure achieving TVA's strategic goals of providing lost cost rates, reliability, and responsibility. The TVA partnership group works with TVA distributors to implement strategic energy efficiency design for distribution circuits and energy efficiency technologies, including smart grid integration.

Exhibit 10-1:

TVA Environmental Innovations

Greenhouse Gas Emissions

TVA operates formal employee car/van pooling and employee telecommuting programs as a measure to reduce the agency's Scope 3 GHG emissions. TVA also leads carbon sequestration activities, like tree planting.

Sustainable Acquisition

To support sustainable acquisition, TVA developed a "green matrix" that includes products/items that meet green procurement standards and environmental regulations.

High-Performance Facilities

To achieve goals set in relation to high-performance facilities, TVA uses heating and cooling fountains, smaller pumps in heating systems, and membrane heat exchange systems. Additionally, TVA is currently installing personal workstation lighting and work station occupancy sensors to reduce energy use.

TVA plans to go above and beyond the EO requirement to retrofit 15 percent of its existing buildings by FY 2015 using the "Sustainable Guiding Principles" by committing to retrofitting its two largest buildings first which represent 21% of its goal subject square footage applicable to this requirement.

Regional and Local Planning

As part of the TVA commitment to regional and local planning and energy use reductions, the agency has decreased its number of facilities through strategic consolidations.

Since 2003, the agency has operated "Growth Readiness," a program using collaborative planning methods to help communities within its service area create smart growth policies around water use and to support sustainable development. Through this program, 230 communities have evaluated their codes and ordinances against model principles. Average initial scores were 39 out of 100 points, indicating 'serious reform needed'.

After checking back with these programs five years later, 123 of these communities report that they have made, or plan to make changes to achieve more quality growth will result in scores increasing by 41 percent to 54.6. In addition, communities report the use of best practices promoted by the program in 57 projects including pervious pavement, preserved open space, grassy swales, and bio-retention and rain gardens across the TVA region.

TVA has worked with key partners including EPA Region IV, EPA Office of Smart Growth and the Southeast Watershed Forum to develop a new Quality Growth Worksheet, training curriculum and workshop series to address environmental concerns in a wider set of Smart Growth issues.

Pollution Prevention and Waste Elimination

To address pollution and eliminate waste, TVA is guided by EPCRA. Among other things, TVA revised office supply vendor contracts to include recycled paper. The agency also has limited the use of sheetrock in its primary office facilities.

Electronic Stewardship and Data Centers

In the goal area of electronic stewardship and data centers, TVA has taken action to consolidate printers, activate default duplex printing, and install energy efficient phone systems.

Other Innovations

Other innovations that address goals beyond those outlined by EO 13514 include development of a TVA Land Health Metric to assess public land conditions and planning needs. TVA has also developed a Rapid Assessment Method (TVA RAM) for assessing wetland ecological conditions. Finally, TVA created an Environmental Information Center as a resource for stakeholders.

Section 3: Agency Self Evaluation

Does your plan provide/consider overarching strategies and approaches for achieving long-term sustainability goals?	Yes
Does your plan identify milestones and resources needed for implementation?	Yes
Does your plan align with your agency's 2011 budget submission?	Yes
Is your plan consistent with your agency's FY 2011 budget and appropriately aligned to reflect your agency's planned FY 2012 budget submission?	Yes
Does your plan integrate existing EO and statutory requirements into a single framework and align with other existing mission and management related goals to make the best use of available resources?	Yes
Does your plan provide methods for obtaining data needed to measure progress, evaluate results, and improve performance?	Yes

TVA developed this SSPP using a multi-committee collaborative process and the plan reflects the work of staff across the TVA organization. The groups worked together to develop strategies to meet the goals and targets set forth in the EO and benefitted from as much cross communication as possible. The long term goal of the TVA Environmental Sustainability Program is to change the culture of TVA from focusing on compliance and reaction to proactive pursuit of environmental, economic, and social benefit beyond what is required by law.

The TVA SSPP has clearly identified milestones as laid out in the EO and it will serve as a guide in implementing projects that achieve the goals and milestones listed in the plan. In addition, the goals and strategies to meet those goals have been analyzed in terms of capital costs, employee time, and the associated environmental, economic, and social benefits. TVA intends to use this SSPP as an integral part of our operations going forward and a constant reminder of our commitment to sustainability in all of our actions.

As TVA developed this plan, we started with the TVA Mission and analyzed how that mission aligned with sustainability. The TVA Mission is to serve the Tennessee Valley through Energy, Environment, and Economic Development. These areas of service have a direct, clear relationship with the main tenets of sustainability, so achieving the EO Sustainability goals directly supports the broader TVA Mission.

Finally, we realize that a plan without measurement and review is not useful for continuous improvement. Therefore, we have a renewed commitment and focus to tracking environmental and social benefits in and outside of our organization. A commitment to sustainability is a commitment to stakeholders including the environment, our employees, our neighbors, and our customers. In order to measure the success of this plan we plan to measure stakeholder satisfaction and feedback on our progress as well as traditional environmental metrics such as waste diversion and recycling, GHG emissions, energy usage, water usage, and green purchasing.

TVA has planned actions to achieve success on the OMB scorecard align with our strategies and actions defined for many of our goals in Section II. We find our success with the scorecard directly aligned with our commitment to this sustainability plan and achieving the goals set forth. The following table summarizes those actions and will serve as our roadmap for the first year and plan for success on the OMB scorecard.

OMB Scorecard Area	TVA Action	Target Date (7-12/10 or 1-6/11)
Reduction in Energy Intensity in goal subject facilities compared with 2003	TVA will expand beyond the COC and KOC and start work applying the Sustainable Guiding Principles to many of its smaller buildings. This will not only help with quantity accounting through the FRPP but will help demonstrate annual progress toward 100% conformance.	December 2010
Reduction in Energy Intensity in goal subject facilities compared with 2003	A study of the COC energy management system is being contracted for 2010. The study will provide an assessment of the current system and will provide options, costs and potential savings for implementation of a new system.	December 2010
Percent of new building designs begun since October 1, 2006 that are 30% more efficient than relevant code.	To insure that no new construction or major renovation takes place without accounting for these requirements a new construction/major renovation check box will be added to the NEPA review, which is performed for every TVA action dealing with the environment. If checked, when the review is submitted electronically this will generate an email sent to a special mailbox, which has already been set up, that Internal Energy Management (IEMP) staff can check periodically. Staff can then follow up with the appropriate people to insure that they are aware of the Sustainable Guiding Principles and can apply them to the building.	July 2010
Percent of new building designs begun since October 1, 2006 that are 30% more efficient than relevant code.	Whenever the need for new space is identified or renovation of an existing space is needed the TVA Standard Process and Procedure SPP 3.2 - Internal Energy Efficiency Process (Including Potable Water and Sustainability as Related to Energy) and SPP 3.3 - Resource Efficient Building Design Process shall be followed. Both these processes, which have been signed by TVA top management, make up TVA Sustainable Buildings Implementation Plan.	July 2010
Percent of new building designs begun since October 1, 2006 that are 30% more efficient than relevant code.	All new RFPs for contracted building design services shall include the Sustainable Guiding Principles including the need for documentation that verifies compliance.	December 2010
Percent of new building designs begun since October 1, 2006 that are 30% more efficient than relevant code.	This fiscal year TVA has begun design work on a major 65,000 sf training center to support power plant operations. The TVA manager has been working closely with the FM architect and contracted A/E services to incorporate the Sustainable Principles and to ensure that the building will perform 30% better than the ASHRAE code.	December 2010
Implementing Sustainable / Green Design Principles	TVA energy use is currently 60,000 Btu/sf/yr compared to the rest of the Federal Government which is averaging 110,000 Btu/sf/yr. To go even lower TVA has contracted with a nationally known energy/sustainable company to review past TVA work and make innovative energy/water/sustainable recommendations to achieve even better performance. The results of this collaboration will be a list of “next generation / dream” energy efficiency projects for analysis and study.	December 20110

OMB Scorecard Area	TVA Action	Target Date (7-12/10 or 1-6/11)
Implementing Sustainable / Green Design Principles	Work planned for next fiscal year and beyond is new efficient open office lighting with daylighting controls for the COC, documentation of integrated team approach for both COC and KOC and integration with the TVA EMS, occupant feedback study (KOC and COC), installation of a domestic solar hot water system for the KOC, documentation of the use of low emitting materials and current TVA office recycling services (KOC and COC).	July 2011
Use of renewable energy as a percentage of facility electricity use.	One way TVA plans is meeting the target is through green power switch blocks monthly for the Knoxville Office Complex, Chattanooga Office Complex, and Huntsville office building totaling 1,170 MWh.	July 2011
Use of renewable energy as a percentage of facility electricity use.	Another way TVA plans on meeting the target is through Hydro Modernization Program (HMOD) is of particular importance in terms of energy management. There are 38 units remaining in the HMOD program for reliability and/or capacity increases.	July 2011
Use of renewable energy as a percentage of facility electricity use.	TVA plans on determining the feasibility of implementing building integrated photovoltaics at the COC.	July 2011
Reduction in water intensity compared with 2007.	TVA continues its comprehensive energy and water evaluations on 25% of covered facilities each year.	December 2010
Reduction in water intensity compared with 2007.	TVA currently has multiple water-savings projects underway at several office buildings. These projects include installing low-flow water closets, urinals, showerheads, and low-flow aerators for lavatories and sinks throughout.	December 2010
Reduction in water intensity compared with 2007.	TVA has plans to look at water reuse through a rooftop rainwater collection systems being considered for the Chattanooga Office Complex.	July 2011
EMS report card	Sustainability metrics will be tracked for all business plans through the comprehensive TVA Environmental Management System.	July 2011
EMS report card	Launched on Earth Day 2010, the TVA Personal Sustainability program will further engage and empower employees this year.	May 2010
Agency has affirmative purchasing program for green products and services, demonstrates and monitors compliance	TVA will implement a Sustainable Acquisition system that will require all contractual actions to evaluate the use/purchase of items and services, which when evaluated against TVA performance requirements, meet or exceed established green criteria.	December 2010

OMB Scorecard Area	TVA Action	Target Date (7-12/10 or 1-6/11)
Agency has affirmative purchasing program for green products and services, demonstrates and monitors compliance	A re-formed Sustainable Acquisition (Green Purchasing) Team to include staff with budget responsibilities, staff from the Office of General Counsel and Environmental Group, members of the TVA Sustainability Team, members of the TVA Strategic Business Units (SBUs), and staff from Supply Chain and Line organizations. The team will have a dedicated manager and staff support in order to overseeing promotion and training efforts, trouble-shoot and correct problems within the program, revamp the Green Product Matrix, and monitor and track program implementation.	December 2010
Agency has affirmative purchasing program for green products and services, demonstrates and monitors compliance	Revamp its Green Product Matrix, which is a listing of routine products that TVA procures with corresponding green procurement criteria and is organized by TVA-friendly nomenclature.	December 2010
Agency has affirmative purchasing program for green products and services, demonstrates and monitors compliance	Begin to incorporate Sustainable Acquisition contract language into the Terms and Conditions of new TVA contracts by the end of FY2010	December 2010
Agency has affirmative purchasing program for green products and services, demonstrates and monitors compliance	Develop an Annual Sustainable Acquisition Report aligned to the requirements of the EO 13514.	December 2010
Acquires greater than 95% EPEAT Electronics	Since July 2008, TVA has purchased 98+% EPEAT-registered items for covered electronic product acquisitions.	July 2010
Acquires greater than 95% EPEAT Electronics	Specifically, for each type of device at TVA that has Energy star qualified models, the Information Services Team work with the TVA Sustainable Acquisitions Team to keep Energy Star specifications and EPEAT-registered brands in future procurement requests.	December 2010

APPENDIX - Building Operation and Maintenance Actions

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 2009:

- Recycle scrap metals, used oil, substation and communication station service batteries, and storm damaged or deteriorating steel structures
- Recycle expired fluorescent lamps
- Recycle or reuse waste material when feasible
- Educate employees on energy efficiency
- Encourage employees to implement energy-efficient ideas and practices
- Turn off equipment when not needed
- Have custodians turn off building equipment after cleaning
- Clean lamps, fixtures, and diffusers
- Use the most efficient lamps available (i.e., screw-in fluorescent, screw-in halogen, screw-in high pressure sodium, energy efficient fluorescent lamps, etc.)
- Reduce lighting levels where light output exceeds requirements for the space
- Install motion sensors to control lighting in rooms where economical (offices, restrooms, conference rooms, etc.)
- Install light switches or motion sensors in areas not currently controlled
- Disconnect unnecessary lamps and ballasts
- Disconnect unnecessary transformers
- Install energy-efficient electronic ballasts
- Perform group re-lamping
- Install photocell control on outdoor lighting
- Rewire lamps to permit shutoff of unneeded lights
- Minimize the number of ballasts installed (use a four-lamp ballast for two adjacent two-lamp fixtures)
- Revise building operating procedures for efficiency and cost

- Install programmable thermostats and use the night and weekend setback features to reduce energy use during unoccupied periods
- Set thermostats in mechanical rooms and unoccupied areas so the least amount of energy will be used without causing the equipment to deteriorate
- Verify and calibrate all controls periodically, including time clocks
- Keep all outside doors and windows closed when heating or cooling, using vestibules properly
- Keep garage and warehouse doors closed as much as possible while heating or cooling
- Replace broken windows
- Replace missing insulation
- Add caulking where necessary
- Replace worn weather-stripping on windows and doors
- Reduce the amount of infiltration air where possible but 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 (re-commissioning)
- Optimize chiller operation
- Recycle waste heat when feasible
- Lower domestic hot water temperature

- Repair hot, chilled, or domestic water leaks
- Cut off nonessential gas to buildings during the summer
- Replace motors, use properly sized energy efficient motors
- Balance three-phase loads
- Use cog-type belts for higher efficiency
- Eliminate steam trap leaks
- Repair water leaks
- Install low-flow faucets and shower heads
- Install automatic flush valves
- Properly insulate hot water and steam lines to reduce energy loss
- Replace less efficient motors with premium high efficiency motors.

[1] EPEAT products are addressed in Goal 9: Electronic Stewardship and Data Centers.