United States Department of Agriculture
Research, Education, and Economics

ARS ❑ CSREES ❑ ERS ❑ NASS

Policy &Procedures

Title: Energy, Water, and Sustainability Policy

Number: 134.2-ARS

Date: August 3, 2009

Originating Office: Facilities Division, AFM/ARS

This Replaces: ARS 134.2 dated 7/6/98

Distribution: ARS Headquarters, Areas, Locations, NASS, CSREES and ERS offices

This P&P provides the Agency's plan to implement the goals and requirements of the Energy Policy Act of 2005 (EPACT 2005), Executive Order (EO) 13423 – "Strengthening Federal Environmental, Energy, and Transportation Management," and the Energy Independence and Security Act of 2007.

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Energy, Water, and Sustainability Policy

1. Purpose

The Energy Policy Act of 2005 (EPACT 2005), Executive Order (EO) 13423 – "Strengthening Federal Environmental, Energy, and Transportation Management**,**" and the Energy Independence and Security Act (EISA) of 2007 require executive departments and Federal agencies to conserve energy and water; to design, construct, and maintain sustainable facilities; and procure environmentally preferable products. They set mandatory goals. The Department of Energy (DOE) has issued implementing instructions for EO 13423. This Policy & Procedure (P&P) provides a plan for the Research, Education, and Economics (REE) Mission Area to implement these requirements. It applies to all of REE.

2. Background

Reducing energy costs is a top priority for REE. The Federal government is the largest consumer of energy in the country. Congress and the President have charged Federal agencies to lead by example by making significant efforts in conservation of energy and water, good stewardship of resources, and by creating sustainable facilities. Meeting this challenge is mandatory.

REE has over 3,200 buildings in over 100 locations nation-wide. They include laboratories, offices, greenhouses, agricultural buildings, and bio-containment facilities. Many of these facilities are very energy intensive. About 85 percent of the total cost of ownership of a facility is in operation and maintenance (O&M), and about 40 percent of that (or about 1/3 of the total O&M cost) is utilities. REE also has over 3,600 vehicles. This represents a significant energy expense and an opportunity to save money.

3. Policy

Consistent with REE's mission and without compromising health and safety, it is REE policy to give energy and water conservation as well as sustainability, prime consideration in the acquisition, use, and disposal of all property and in the performance of all functions. This action will reduce the impact of our activities on the environment and help conserve resources. Efficiency and conservation shall be integrated into the core activities of the Agency. It shall be every employee's responsibility to ensure that every reasonable effort is made to reduce operating costs and conserve energy, water, and resources.

4. Authorities

The Energy Policy Act of 2005 (EPACT 2005)

Executive Order (EO) 13423 – "Strengthening Federal Environmental, Energy, and Transportation Management"

The Energy Independence and Security Act (EISA) of 2007

5. Responsibilities

Responsibility for carrying out the requirements of EPACT 2005, EISA, and EO 13423 falls on the entire mission area. For more detailed responsibilities see APPENDIX 1.

Acquisition and Property Division (APD)

APD will be responsible for procurement policy including green purchasing, fleet transportation, electronics stewardship, and purchase cards. Procurement policy will include non-facility bio-based products, recycling and recycled products, Energy Star® and other energy efficient, environmentally preferable products and water consumption reducing products, along with ESPCs where the technical support during the design and construction phases is provided by the ARS Area or location or NASS, ERS or CSREES Field Office. Property and Support Services Branch, APD, is responsible for Fleet Transportation relative to petroleum use, alternative fuels, flex fuel, hybrid vehicles, and maintenance of the Federal Automotive Statistical Tool (FAST) system. APD will be responsible for Information Technology (IT) acquisitions that are specified by the Office of the Chief Information Officer (OCIO) using the EPEAT, Energy Star®, and EO 13221 – "Energy Efficient Standby Power Devices." APD will develop and implement a comprehensive green purchasing plan and a fleet fuel efficiency plan.

Facilities Division (FD)

FD will be responsible for overseeing the implementation of EPACT 2005, EISA, and EO 13423 as they relate to major facilities.

Excluded Facilities

This P&P does not apply to the following facilities:

a. REE facilities that have minimal energy usage per square foot (e.g., sheds, outside parking garages, and barns that are not climate controlled).

b. United States Department of Agriculture (USDA) leased facilities where the landlord is responsible for paying the utility bills.

c. General Services Administration (GSA) -controlled space assigned to REE where REE does not directly pay for utilities.

d. Shared and/or free space provided to REE where REE does not directly pay utility costs.

Occupants of these excluded facilities should still conserve energy, water, and resources in any ways available to them.

The Safety, Health, and Environmental Management Branch (SHEMB) will be responsible for implementing and coordinating the requirements for non-facility ozone depleting compounds and hazardous chemicals and for coordinating the expansion of the EMS program to include EO 13423.

The Real Property Management Branch (RPMB) will be responsible for maintaining the Corporate Property Automated Information System (CPAIS) and sustainable leasing, acquisition, and disposal of real property.

Facilities Engineering Branch (FEB) and Facilities Contracting Branch (FCB) will be responsible for water conservation, reducing use of ozone depleting compounds, renewable energy, environmentally preferable products, UESCs, ESPCs (where the technical support during the design and construction phases is provided by an FD Engineering Project Manager (EPM), and sustainable design including the incorporation of the Five Guiding Principles of the Sustainable High Performance Buildings Memorandum of Understanding into all new and remodeled major buildings. The Five Guiding Principles are:

1. Use integrated design and commissioning
2. Optimize energy efficiency using measurement and verification
3. Protect and conserve water
4. Enhance indoor environmental quality
5. Reduce the environmental impact of materials in Federal buildings

All of FD will be responsible for maintaining a sustainable building inventory based on the Five Guiding Principles, and building Operation and Maintenance (O&M) policy and guidance. See APPENDIX 4 for more information on the Five Guiding Principles.

The ARS Facilities Energy Manager (FEM) will be responsible for the overall implementation and management of the Energy, Water, and Sustainability Plan.

NASS, ERS and CSREES

NASS, ERS and CSREES activities are largely office oriented and conducted in leased space where utilities are included in lease payments. All occupants of these spaces should conserve energy, water and resources in any manner available to them and encourage landlords to do so as well. Vehicle and electronics use shall also conform to this policy.

ARS Areas and locations

Areas and locations will be responsible for repair and maintenance (R&M) projects, and building authority projects within their delegated authority, use of purchase cards, the National Environmental Policy Act (NEPA) documentation related to facilities, O&M of facilities, record keeping, and reporting. The primary responsibility for green or environmentally preferable purchasing such as Bio-based, Recycled, Energy Star®, FEMP designated, WaterSense products, etc., lies on the program offices. Existing facilities shall be sustainable.

OCIO and Information Technology Specialists (ITS)

OCIO/ITS will practice good electronics stewardship by utilizing EPEAT and Energy Star® products, and implementing IT practices designed to conserve energy. The Chief Information Officer (CIO) shall be responsible.

6. Definitions

Alternative fuel includes renewable fuel, natural gas, liquid propane, hydrogen, coal-derived liquid fuel, and electricity. Alternative fuel is fuel that is substantially not petroleum (oil). Renewable fuel is produced from biomass or bio-based oils. Biodiesel (in a 20 percent or higher blend), 85 percent ethanol/15 percent gasoline (E85), compressed natural gas (CNG), Liquefied Natural Gas (LNG), and Liquid Propane Gas (LPG) are alternative fuels.

A bio-based or BioPreferred product is a product determined by the USDA to be a commercial or industrial product (other than food or feed) that is composed in whole or in significant part, of biological products including renewable, domestic agricultural materials including plant, animal, marine, or forestry materials.

Electronics stewardship involves purchasing, using, and disposing of computers responsibly.

An EMS framework is a continual cycle of planning, implementing, reviewing, and improving to allow an organization to consistently address the effects its operations may have on the environment and support continual improvement. Aspects are examined for their impacts. It is a continuous cycle of improvement which consists of four steps: Plan, Do, Check, and Act.

Environmentally preferable products are products and services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. This comparison may consider raw materials acquisition, product manufacturing, packaging, distribution, reuse, operation, maintenance, and disposal. Bio-based, recycled, energy and water efficient, sustainably harvested, low toxicity, and rapidly renewable products are examples of environmentally preferable products.
EPEAT is a mandatory on-line system to help purchasers in the public and private sectors evaluate, compare, and select desktop computers, notebooks, and monitors based on their environmental attributes.

An ESPC is a performance contract between an Energy Service Company (ESCO) and a Federal customer. A UESC is a similar arrangement with a utility. With ESPCs and UESCs, agencies can take advantage of private sector capital to fund energy and water saving equipment and renewable energy systems at Federal facilities. The cost of improvements is paid from the energy savings. Agencies can combine funds, obtain state or utility-sponsored rebates for energy-efficient improvements, and can apply for public benefits funds set aside to promote energy efficiency.

A facility means any building, installation, structure, or other property owned or operated by, constructed for, or leased to the Federal Government. This includes a group of facilities at a single location or multiple locations managed as an integrated operation, and Contractor-operated facilities owned by the Federal Government. It may be a group of buildings or structures that share the same servicing energy and water utilities so that utility data can be aggregated easily.

Greenhouse Gases include CO_2, CH_4, SF_6, N_2O, HFCs, PFCs and other natural or man-made gases in the atmosphere that absorb and emit radiation within the thermal infrared range.

Renewable Energy means energy produced by solar, wind, biomass, landfill gas, hydrokinetic, ocean (including tidal, wave, current, and thermal), or geothermal resources.

Sustainability is defined as the ability to meet present needs without compromising those of future generations. Sustainability also means incorporating the Five Guiding Principles as noted earlier. The Five Guiding Principles are explained in APPENDIX 4.

7. Acronyms

A list of acronyms is provided in APPENDIX 2.

8. Procedures

FD will issue the REE Energy, Water, and Sustainability Plan, and Implementation Strategies in which the actions to be taken and the Agency roles and responsibilities will be defined in more detail in APPENDIX 1. A list of low or no cost actions is included in APPENDIX 3.

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Deputy Administrator
Administrative and Financial Management

Appendix 1
Action Plan
REE Energy Water and Sustainability Plan and Implementation Strategies

1. Management Plan Framework

As directed by EO 13423, the overarching framework of the energy, water, and sustainability plan will be an Environmental Management System (EMS). Locations will incorporate their responsibilities into their existing EMS. Offices will develop an office EMS. A second level EMS will be implemented at headquarters (HQ). An EMS is a framework that allows an organization to consistently address the effects its operations may have on the environment. It is a continual cycle of planning (plan), implementing (do), reviewing (check), and improving (act) a process. It is based on an examination of cause and effect at each facility where activities may have an impact on the environment.

The consumption of energy and water are additional impacts that can be tracked by the existing EMS framework. Expanding the scope of EMS to incorporate the requirements of EO 13423 is the stated intent of the Office of the Federal Environmental Executive (OFEE) and the Interagency EMS Working Group. This will enhance REE's overall goal of complying with the EOs and other laws.

2. Authorities

EPACT 2005 requires Agencies to:

- Reduce energy consumption by 2 percent per year through Fiscal Year (FY) 2015 based on FY 2003 consumption levels.
- Ensure all Federal buildings have advanced electric meters, where cost effective, by the end of FY 2012.
- Ensure all new building designs will be 30 percent more energy efficient than American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) 90.1-2004.
- Routinely use alternative fuel in dual-fueled alternative fuel vehicles (AFVs) unless an alternative fueling station is too far away or too expensive, based on Agency waiver.

EO 13423 requires Agencies to:

- Reduce energy intensity by 3 percent per year through FY 2015 based on FY 2003 consumption levels (increasing EPACT 2005).
- Reduce greenhouse gases by 3 percent annually or 30 percent through FY 2015 based on FY 2003 levels through reduction of energy intensity.
- Reduce water consumption associated with buildings by 2 percent per year based on FY 2007 consumption levels through FY 2015.

- Purchase or produce renewable energy as a percentage of the current year's electrical consumption in the amount of 3 percent in FY 2007-2009, 5 percent in FY 2010-FY 2012, and 7.5 percent in FY 2013 and so on.
- Have 15 percent of the building inventory sustainable by FY 2015.
- Reduce use of petroleum consumption, increase use of alternative fuels, and purchase alternative fuel hybrid and plug-in hybrid vehicles when commercially available.
- Increase AFV use at least 10 percent annually.
- Reduce total fleet petroleum consumption by 2 percent annually through the end of FY 2015 based on the FY 2005 baseline.
- Recycle and purchase recycled products.
- Purchase Energy Star® or Federal Energy Management Program (FEMP) designated energy efficient products.
- Purchase 95 percent of electronics using the Electronic Product Environmental Assessment Tool (EPEAT) and enable Energy Star® features on 100 percent of computers.
- Purchase bio-based products.
- Purchase environmentally preferable products
- Use paper of at least 30 percent postconsumer fiber content
- Reduce ozone depleting compounds.
- Reduce hazardous chemicals.
- Increase the use of Environmental Management Systems (EMS).
- Incorporate sustainability into lease provisions.
- Incorporate The Five Guiding Principles into all new designs. They are:

  1. Use integrated design and commissioning
  2. Optimize energy efficiency using measurement and verification
  3. Protect and conserve water
  4. Enhance indoor environmental quality
  5. Reduce the environmental impact of materials in Federal buildings

EISA requires Agencies to:

- Reduce vehicle fuel consumption. Reduce petroleum consumption by 20 percent by 10/1/2015 from a FY 2005 baseline.
- Increase vehicle alternative fuel use by 10 percent by 10/1/2015 from a FY 2005 baseline.
- Increase use of hybrids, Neighborhood Electric Vehicles (NEVs), and more fuel efficient vehicles.
- Have at least one renewable fuel pump at each Federal fueling center.
- Include energy efficiency and renewable energy in lease language.
- Use energy efficient new and replacement lighting and bulbs.
- Reduce energy consumption in buildings by 30 percent by FY 2015.
- Have an energy manager for each facility.
- Perform facility energy and water surveys and re-commissioning of facilities every four years, and implement energy efficiency improvements within 2 years;

- Reduce fossil fuel generated energy consumption in 2010 – 55 percent, 2015 – 65 percent, 2020 – 80 percent, 2025 – 90 percent, and 2030 – 100 percent in new facilities and major renovations.
- Use a green building certification system.
- Use energy efficient equipment for replacements.
- Install advanced metering of natural gas and steam by the end of FY 2016.
- Lease only Energy Star® buildings when over 10,000 Square Feet (SF).
- Provide solar hot water heaters for 30 percent of hot water demand in new buildings.
- Purchase appliances requiring less than 1 watt of standby power.
- Purchase Energy Star® or FEMP designated energy-efficient products.

REE targets identified in the USDA Strategic Plan to meet the Facility Energy and Water Goals of EO 13423 are:

- 20 percent of REE's annual facility energy costs should be invested in energy efficiency improvements
- At least half of REE's required annual investment in energy improvements (ten percent of annual energy costs) shall be privately financed through Energy Savings Performance Contracts (ESPCs) or Utility Energy Service Contracts (UESCs)
- Assuming no large self-generated renewable energy projects come on line, REE must purchase renewable energy in the following amounts based on electricity consumption:
    - Not less than 3 percent in FY 2007 through 2009
    - Not less than 5 percent in FY 2010 through 2012
    - Not less than 7.5 percent in FY 2013 and each year thereafter

3. Roles and Responsibilities

NASS, ERS and CSREES

NASS, ERS and CSREES will develop an Office EMS. All occupants of leased spaces should conserve energy water and resources in any manner available to them whether or not utilities are paid for as part of the lease payment. Agencies using motor vehicles should purchase, lease, and operate them in accordance with EPACT 2005, EO 13423 and EISA.

ARS Facilities Division (FD)

FD will:

- Develop and implement policies and procedures to incorporate the requirements of EPACT 2005, the EISA of 2007 and EO 13423 into all new and existing facilities.
- Expand the EMS framework to include all aspects of EO 13423.

Specifically:

Safety, Health, and Environmental Management Branch (SHEMB) will:

- Develop and implement policies to reduce the use of hazardous chemicals and promote the purchase of lower risk chemicals and toxic materials from a priority list they establish.
- Promote the reduction and prohibition of the use of ozone depleting compounds in consumer and laboratory goods unless another non-ozone depleting compound will not accomplish the Agency's mission.
- Coordinate the expansion of the EMS framework to include all aspects of EO 13423.

Facilities Engineering Branch and Facilities Contracting Branch (FEB/FCB) will:

- Develop and implement policies and procedures (P&Ps) to incorporate the requirements of EPACT 2005, the EISA of 2007, and EO 13423 into all new major construction and modernization projects.
- Promote the reduction and prohibition of the use of ozone depleting compounds for refrigeration, fire suppression, and other uses except where it is not cost effective to replace equipment or if another non-ozone depleting compound will not accomplish the Agency's mission.
- Design all projects to be sustainable and incorporate the Five Guiding Principles of the Sustainable High Performance Buildings Memorandum of Understanding. The Five Guiding Principles are:

    1. Use integrated design and commissioning
    2. Optimize energy efficiency using measurement and verification
    3. Protect and conserve water
    4. Enhance indoor environmental quality
    5. Reduce the environmental impact of materials in Federal buildings

- Design all new facilities to achieve energy consumption levels that are at least 30 percent below ASHRAE 90.1-2004, if life cycle cost effective, subject to 71 Federal Register (FR)70275 or the State Energy Code whichever is more stringent. Energy modeling is good practice.
- Design all new projects to incorporate all cost effective water conservation measures available. Cost effectiveness is based on a payback period of 10 years or less. Building life is considered to be 40 years.
- Consider energy, water conservation, and sustainability in preparing environmental assessments.
- Use energy-efficient new and replacement lighting and bulbs in all designs.
- Design all new buildings and major renovations to reduce fossil fuel generated energy consumption in 2010 – 55 percent, 2015 – 65 percent, 2020 – 80 percent, 2025 – 90 percent, and 2030 – 100 percent.
- Design all new buildings and major renovations to provide solar hot water heaters for 30 percent of hot water demand.
- Commission all new construction and modernization projects.

- Meter all utilities at each building where practicable. All electric, natural gas, and steam meters will be advanced (smart) meters where cost effective. It is presumed to be cost effective for energy intensive buildings 10,000 SF or over. Advanced meters will be connected to the Internet or the building management system. To the greatest extent possible, the meters for all utilities will be connected to the advanced electric meter and the building management system. Cyber-security and virus protection measures will be provided in the metering network.
- Design all projects to provide for indoor environmental quality including thermal comfort with personal control, sound absorbing materials and isolation, preventing bacteria, mold and fungi, controlling odors and contaminants, integrating natural and artificial light, providing water quality, high performance windows and natural ventilation, protecting buildings during construction, protecting air intakes, monitoring air quality, avoiding products containing formaldehyde, volatile organic compounds (VOCs), and other harmful off-gassing or sources of exposure.
- Require in all contracts and designs, energy and water efficient, recycled, bio-based, sustainably harvested products, rapidly renewable, and other environmentally preferable products; to the greatest extent possible reduce and divert waste, recycle, reduce hazardous chemicals, and prohibit ozone depleting compounds.
- Incorporate beneficial landscaping into all projects.
- Follow an accepted methodology for establishing the sustainability of a building such as Leadership in Energy and Environmental Design (LEED), Green Globes, Energy Star® or Labs 21.
- Establish, support, and administer ESPCs and UESCs where the technical support during the design and construction phases is provided by an FD Engineering Project Manager (EPM).
- Ensure that all new designs for construction or major renovations include renewable energy where cost effective.
- Engineers and Contracting Officers (COs) shall ensure that appropriate clauses are included in all construction and architect-engineering (A-E) service contracts and specifications.
- Structure contracts and statements of work to reduce greenhouse gases.

Real Property Management Branch (RPMB)/Asset Management will:

- Incorporate requirements for energy and water conservation, sustainability, and renewable energy into all leases.
- Ensure that existing facilities conform to, or are brought into conformance with, the requirements of EO 13423, the EISA of 2007, and EPACT 2005. Sustainability of the facility inventory will be maximized and documented.
- Manage and dispose of assets in a manner that will optimize energy, water, and resource conservation.
- Require that facilities have an operation and maintenance plan, and perform preventive maintenance to ensure that equipment and systems perform efficiently and economically for their planned useful life.

- Ensure advanced electric meters are installed in all existing buildings where cost effective by the end of FY 2012 and advanced natural gas and steam meters are installed by the end of FY 2016.
- Ensure that all newly leased buildings of 10,000 SF or over have achieved an Energy Star® rating within the most recent year.
- Ensure that each prospectus for a new project includes energy and water conservation and renewable energy.
- Include language in leases about identification of hazards, reducing hazardous chemicals, and not releasing ozone depleting chemicals.

The Facilities Energy Manager will:

- Be responsible for the overall implementation and management of this plan.
- Champion, develop, and implement programs and initiatives to encourage and effect measurable improvements in energy and water conservation, and sustainability;
- Interpret this plan against the requirements of EPACT 2005, the EISA of 2007 and EO 13423.
- Monitor related reporting needs and calls for data in order to report to the Department or other Agencies in accordance with established reporting deadlines.
- Coordinate the activities of FD in carrying out this plan.
- Disseminate energy and water conservation and sustainability information to the Agency.

Acquisition and Property Division (APD)

APD Acquisition Programs and Oversight Branch (APOB) will:

- Develop, promulgate, and maintain green purchasing policies. The green purchasing policies will include procurement preference for biobased products, recycled products, Energy Star®, FEMP designated and other energy-efficient products, products with low standby power consumption, EPEAT and water saving products including WaterSense products, low toxicity products, non ozone depleting compounds, and other environmentally preferable products. The green purchasing policies will include training of Contracting Officers (CO), CO's representatives, and purchase card holders through the use of memos, bulletins, policy guidance or classes, and maintain a record keeping system that will document and quantify program compliance.
- Inform card holders of policies for use of purchase cards to comply with APD green procurement policies for environmentally preferable products, recycled and bio-based products, WaterSense and Energy Star®, FEMP designated or other energy-efficient products.
- Provide reports in accordance with established reporting deadlines.
- Procure electronics using specifications created by OCIO that conform to the electronics stewardship and energy conservation requirements of EO 13423, EO 13221, and the green purchasing program with electronics disposal done according to the existing Federal Management policy.

- APD will manage contracting for ESPCs where the technical support during the design and construction phases is provided by the Area or location.
- Structure contracts and statements of work to reduce greenhouse gases.

APD Property Support Services Branch Fleet Transportation will:

- Develop and implement policies for meeting the goals of EO 13423 and the EISA of 2007, addressing alternative fuels, vehicles with increased fuel economy, hybrid vehicles, NEVs, and plug in hybrid vehicles when fleet purchases are justified and when such vehicles meet the mission requirements; substitution of cars for light trucks, increased vehicle load factors, decreased vehicle miles traveled and decreased fleet size.
- Be responsible for documenting, collecting, and entering data into the FAST system. APD will ensure that the vehicle fuel type, consumption and cost records are maintained for fleet vehicles captured in the FAST system.
- Train specifiers, purchasers, and users of vehicles on use and availability of vehicles and alternative fuels, and on record keeping requirements.
- Provide reports to FD for the annual energy report and other calls for data.
- Provide oversight of vehicle acquisitions and disposals and reporting as requested,.

Responsibilities of Areas

- Area Directors (ADs) will be accountable for energy and water management and sustainability in their Areas.
- The Deputy Area Directors (DAD), or their designated alternate, will be the primary contact and will be responsible for dissemination of energy and water conservation and sustainability information between HQ and Locations. It is expected that the Area/location Facility Energy Manager, Area Engineer (AOE), Area Safety and Health Manager (ASHM), Asset Manager, and Area Procurement Officer (APO) will play prominent roles.
- Areas will perform all repair and maintenance (R&M) and construct projects within their authority in a manner that will optimize their energy and water conservation and sustainability. Incorporate the applicable portions of the Five Guiding Principles of the Sustainable High Performance Buildings Memorandum of Understanding into all projects as noted earlier.
- Areas will conduct their activities to minimize their impact on the environment and conserve resources.
- The primary responsibility for green or environmentally preferable, energy and water efficient purchasing such as Bio-based, Recycled, Energy Star, FEMP designated, WaterSense products, etc., lies on the program offices.
- Energy and water conservation and sustainability will be a consideration in the Area's National Environmental Policy Act (NEPA) process.
- Areas will ensure that each facility has an energy and water management plan.
- All energy and water management plans shall be reviewed and updated at least annually.

- Procurement specialists and purchase card holders will be aware of the requirements for sustainability, energy and water efficiency, and environmentally preferable products and give them procurement preference.
- Areas will gather energy and water consumption and sustainability information from locations and provide reports to HQ, and Areas will relay energy and water consumption and sustainability information to locations provided by HQ. Areas will enter energy, water, and other green procurement data into automated systems. Areas will benchmark their facilities.
- Areas will assure, through training and verification, that all employees and contractors are knowledgeable regarding energy and water conservation and sustainability requirements.
- Areas will practice responsible electronics stewardship.
- Areas are responsible for reaching the goals set forth in EO 13423, the EISA of 2007, and EPACT 2005 within their Areas.
- Areas will recommend actions and request adequate funds in budgets under their jurisdiction to implement the requirements of this plan.
- Areas will identify and allocate necessary and qualified staff to carry out the requirements of this plan.
- Areas will ensure that Environmental Management System (EMS) committees disseminate information, provide initiative, guidance and assistance, and coordinate energy and water efficiency improvements and sustainability.
- AOE and contract specialists will ensure that appropriate clauses are included in all maintenance, construction, A-E, and other service contracts and specifications.
- Areas will be responsible for documenting and collecting data to be entered into the FAST system. They will ensure that the vehicle fuel type, consumption, and cost records are maintained for both fleet vehicles captured in the FAST system and non-fleet vehicles and other equipment not captured in the FAST system. Fuel data not captured in the FAST system will be reported by locations to HQ through the Areas annually.
- Areas will identify opportunities for ESPCs and UESCs and coordinate them with the ARS Facilities Energy Manager. Areas will cooperate in the investigation and implementation of energy audits, ESPCs, and UESCs by Headquarters.
- Areas will reduce vehicle fuel and petroleum consumption, increase vehicle alternative fuel use, increase use of hybrids, plug in hybrids (when commercially available), Neighborhood Electric Vehicles (NEV), and more fuel efficient vehicles, and routinely use alternative fuel in dual-fuel AFVs unless the alternative fueling station is too far or too expensive, based on Agency waiver.
- Areas will review vehicle purchase requests to assure that they are justified and comply with Manual 221.1.
- Structure contracts and statements of work to reduce greenhouse gases.

Responsibilities of Area/Location Facility Energy Managers

- Each facility will have a trained and qualified, designated Facility Energy Manager. The Facility Energy Manager may be a full time, shared, collateral

duty employee or a contractor. The Facility Energy Manager may be at the Area or location level.

- Facility Energy Managers will perform facility energy and water surveys and re-commissioning or retro-commissioning of covered facilities every four years. Twenty five percent per year shall be surveyed so that all covered facilities are surveyed in four years. Refer to "Facility Energy Management Guidelines and Criteria for Energy and Water Evaluations in Covered Facilities" for guidance on section 432 of EISA.
- Facility Energy Managers will participate in the EMS committees for their facilities.
- Facility Energy Managers will provide initiative and disseminate energy and water conservation and sustainability information
- Facility Energy Mangers will track and enter utility, energy auditing and commissioning information in automated systems and reports.

Responsibilities of ARS Locations (These responsibilities include NASS, ERS and CSREES field offices as applicable)

- Location managers, usually the Administrative Officer (AO), will be aware of the energy and water conservation features of their facilities and how well they are working. Facilities Managers, including the Area/location energy manager and mechanics, will understand the energy and water conservation features of their facilities and ensure that they are performing optimally.
- The primary responsibility for green or environmentally preferable, energy and water efficient purchasing such as Bio-based, Recycled, Energy Star, FEMP designated, WaterSense products, etc., lies on the program offices.
- Locations will conduct their activities to minimize their impact on the environment and conserve resources.
- Locations will perform all R&M and construct projects within their authority in a manner that will optimize their energy and water conservation and sustainability. Incorporate any applicable portions of the Five Guiding Principles into projects. Refer to APPENDIX 4 regarding the Five Guiding Principles.
- Each location will have an energy and water management plan.
- All energy and water management plans shall be reviewed and updated at least annually.
- Procurement specialists and purchase card holders will be trained on the requirements for sustainability, energy and water efficiency and environmentally preferable products, and give them procurement preference.
- Locations will maintain accurate records of consumption and costs of all fuels and utilities including meter readings.
- Locations will verify all utility bills for accuracy and track usage and trends.
- Locations will report energy, water, and other green procurement to Areas and enter data into automated systems.
- Locations will assure through training and verification, that all employees and contractors are knowledgeable regarding energy and water conservation and

sustainability requirements and incorporate information regarding energy and water conservation and sustainability into EMS training.

- Locations will recycle all eligible materials including paper, cardboard, cans, bottles, and toner/ink cartridges, as well as promote the reduction and diversion of waste.
- Locations will practice responsible electronics stewardship and use EPEAT.
- Locations will evaluate their energy and water usage in their respective buildings and identify opportunities to reduce energy consumption.
- Locations will recommend actions and request adequate funds in budgets under their jurisdiction to implement the requirements of this plan.
- Locations will identify and allocate necessary and qualified staff to carry out the requirements of this plan.
- Location EMS committees will disseminate information, provide initiative, and coordinate energy and water efficiency improvements and sustainability.
- Facility engineers and location contract specialists will ensure that appropriate clauses are included in all maintenance, construction, A-E, and other service contracts and specifications within their authority to carry out this policy.
- Locations will be responsible for documenting and collecting data to be entered into the FAST system. FAST data entry is by others. They will ensure that vehicle fuel type, consumption, and cost records are maintained for both fleet vehicles captured in the FAST system, non-fleet vehicles, and other equipment not captured in the FAST system. Mobility equipment data not captured in the FAST system will be reported by locations to HQ through the Areas annually.
- Locations will ensure that all Agency operated fueling stations have at least one renewable fuel pump.
- Locations will identify opportunities for ESPCs and UESCs and coordinate them with the ARS FEM. Locations will cooperate in the investigation and implementation of ESPCs and UESCs by HQ.
- In de-regulated states where multiple utility suppliers are available, locations will purchase utilities from the least expensive source. Utilities will be purchased utilizing GSA area-wide contracts in regulated states. Locations will work with their utilities to reduce utility consumption and cost through demand-side management, efficiency, and conservation. Locations will cooperate with HQ alternative utility procurement efforts.
- Locations will reduce vehicle fuel and petroleum consumption and increase vehicle alternative fuel use, use of hybrids, NEVs, and more fuel efficient vehicles. Locations will routinely use alternative fuel in dual-fueled AFVs unless the alternative fueling station is too far away or too expensive. An Agency waiver must be obtained through APD Fleet Transportation.
- Locations will use green cleaning products exclusively, except where they do not meet mission requirements.
- Locations will remove all mercury-containing products from use, except where no non-mercury-containing product will meet mission requirements.
- Structure contracts and statements of work to reduce greenhouse gases.

Responsibilities of OCIO and ITS

- OCIO/ITS will ensure that electronics purchased are Energy Star® or FEMP designated energy-efficient products. Purchase equipment that uses no more than one watt of stand-by power, or if impracticable, purchase items with the lowest stand-by wattage available.
- OCIO/ITS shall ensure that EPEAT is used to find the best products for all electronics purchases. (unless there is no EPEAT standard for such product)
- OCIO/ITS shall ensure that all power management software and energy saving features of electronics are enabled including Energy Star® settings.
- OCIO/ITS shall be responsible for informing computer users of energy-efficient practices in the use of their computers and facilitating the implementation of those practices.
- OCIO/ITS shall operate and maintain networks and servers in the most energy-efficient manner possible. Explore strategies to reduce the number of data centers and servers. Data centers shall be separately metered to the maximum extent practicable.
- Ozone depleting compounds (i.e., Halon) shall not be used for fire suppression.
- OCIO/ITS shall ensure that computer room and data center air conditioning and ventilation, installed or operated by IT specialists, is properly sized, the most energy-efficient possible, and is not used more than is necessary for optimal performance of the equipment.
- Electronics shall be purchased, used and disposed of according to the existing Federal management policy and USDA Electronics Stewardship Plan. The CIO shall be responsible.

4. Definitions and Information

Acquisition & Disposal

- The disposal of buildings is accomplished by Areas often through HQ by demolition; transfer to state, county, municipal or private ownership; donation, sale or other means. Buildings will be disposed of when they reach the end of their lifespan and/or are no longer effective in providing space to carry out the Agency's mission.
- Recycling and other waste stream diversion should be a part of demolition.

Advanced Metering

- Advanced metering systems collect time-differentiated energy usage data from advanced meters via a network system on either an on-request or defined scheduled basis. Advanced meters can provide usage information on at least a daily basis and have the capability to measure and record interval data at least hourly. They can communicate the data to a remote location. They can also detect power quality problems and electrical anomalies.
  A standard meter is an electromechanical or solid state meter that cumulatively

measures, records and stores aggregated kilowatt hours (kWh), and sometimes demand data that is periodically retrieved for use in customer billing or energy management.

Alternative Fuel Vehicles (AFV), Flexible Fuel Vehicles (FFV), Hybrid Vehicles and Neighborhood Electric Vehicles (NEV)

- Flexible fuel vehicles are specially designed to run on gasoline or any blend of up to 85 percent ethanol (E85).
- An AFV is a vehicle that is specially equipped to use alternative fuels.
- A hybrid vehicle is a vehicle that uses two or more distinct power or fuel sources such as an on-board rechargeable energy storage system and an internal combustion engine for vehicle propulsion. Purchase plug-in hybrids when commercially available.
- An NEV is a speed limited battery operated electric vehicle.

Alternative and Renewable Fuels

- Renewable fuel for vehicles is produced from biomass or bio-based oils. Renewable fuels include ethanol and biodiesel.
- Alternative fuel for vehicles is fuel that is substantially not petroleum (oil). Alternative fuel includes renewable fuel. Alternative fuels are electricity, biodiesel (in a 20 percent or higher blend), 85 percent ethanol/15 percent gasoline (E85), compressed natural gas (CNG), Liquefied Natural Gas (LNG), and Liquid Propane Gas (LPG). Coal-derived liquid fuel, another alternative fuel, can produce more lifecycle emissions than the petroleum fuel it replaces.
- If the office is located within 5 miles (or a 15 minute trip) of an alternative fueling station, an individual is required to use an AFV fleet vehicle unless the fuel is more than 15 cents higher or if a waiver has been obtained. APD has to submit the specific garaged location of all Agency owned, leased alternative fuel vehicles to OPPM for a consolidated USDA report to DOE. DOE grants waivers to offices that are outside the radius/cost area. These offices are exempt from having to acquire alternative fuel 100 percent of the time – as required by EPACT 2005.
- A fueling station is a fixed tank with piping and pump(s) for the storage and dispensing of vehicle fuels.

Beneficial Landscaping

- An environmentally and economically beneficial landscaping program will:
    - Utilize the most suitable plant materials available
    - Use native or acclimated plant materials
    - Require minimum maintenance and irrigation
    - Provide passive energy conservation
    - Manage and seek to reduce the impact of invasive plants on facilities
    - Utilize environmentally and economically sound management practices and materials on facilities

- Utilize environmentally sound landscape practices in the planning, development, and management of USDA facilities without compromising security
- Manage storm runoff

Bio-based Products

- A bio-based (or BioPreferred^{SM}) product is a product determined by the USDA to be a commercial or industrial product (other than food or feed) that is composed in whole or in significant part of biological products including renewable domestic agricultural materials (including plant, animal, and marine materials) or forestry materials.
- BioPreferred^{SM} products get procurement preference. Bio-fuels are excluded from the bio-preferred program.
- Procure bio-based products when they are equivalent in price, performance, and availability to a non-bio-based product.
- Bio-based refers to the feedstock and does not necessarily mean biodegradable or compostable.
- Use the USDA Bio-preferred Catalog at http://www.biopreferred.gov/ to find bio-based products.

Commissioning, Re-commissioning and Retro-commissioning

- Commissioning is the process of ensuring and documenting that building systems are designed, installed, functionally tested, and capable of being operated and maintained according to the owner's operational needs. Commissioning should start on the first day of design and end on the last day of the warranty period. Re-commissioning is commissioning performed after the end of the warranty period to restore a building to its as-designed operational efficiency. Retro-commissioning is commissioning a building that was not previously commissioned.

Demand-Side Management

- Demand-side management (DSM) programs consist of the planning, implementing, and monitoring activities of electric utilities that are designed to encourage consumers to modify their level and pattern of electricity usage. They are utility-sponsored programs promoting more efficient electricity use and can help avoid the costs and environmental concerns associated with power plants including generating facilities, power purchases, and transmission and distribution capacity additions.

Electronic Product Environmental Assessment Tool (EPEAT)

- Annually 95 percent of electronics purchased must meet the EPEAT standards where applicable. EPEAT is an on-line system to help purchasers in the public

and private sectors evaluate, compare, and select desktop computers, notebooks, and monitors based on their environmental attributes.
- Electronics stewardship involves purchasing, using, and disposing of computers responsibly.

Environmental Management System (EMS)

- An EMS framework is a continual cycle of planning, implementing, reviewing, and improving to allow an organization to consistently address the effects its operations may have on the environment, and support continual improvement. Aspects are examined for their impacts. It is a continuous cycle of improvement which consists of four steps: Plan, Do, Check, and Improve.

Energy-Efficient Products

- Energy Star® means a product that is rated for energy efficiency under the EPA Energy Star® program established by Sec. 324A of the Energy Policy and Conservation Act.
- FEMP designated products are identified in a DOE program designating products that consume less energy.
- Products with low standby power consumption per EO 13221 – Energy Efficient Standby Power Devices.
- Energy Star® smart grid capable products should be used when they become available.

Environmentally Preferable Products

- Environmentally Preferable Products are products and services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. This comparison may consider raw materials acquisition, product, manufacturing packaging, distribution, reuse, operation, maintenance, or disposal of the product or service.
- Bio-based, recycled, energy and water efficient, sustainably harvested, low toxicity and rapidly renewable products, are examples of environmentally preferable products.

ESPCs and UESCs

- Energy Service Performance Contracts (ESPC), Utility Energy Services Contracts (UESC), rebates, incentives, or public benefits funds can be used to finance energy savings projects. With ESPCs and UESCs, agencies can take advantage of private sector capital to fund energy and water saving equipment and renewable energy systems at Federal facilities. Agencies can obtain state or utility-sponsored rebates for energy-efficient improvements, and can apply for public benefits funds set aside to promote energy efficiency. Contractors can take advantage of tax incentives.

- An ESPC is a performance contract between an Energy Service Company (ESCO) and a Federal customer. The Federal customer realizes a savings in the cost of energy and related O&M and repair and replacement (R&R) relative to a pre-project baseline. A Super ESPC delivery order is a streamlined process that may be used to add energy-efficiency improvements. The sum of payments to the ESCO, for debt service, O&M, and energy are less than the pre-contract cost of energy and O&M when amortized over the contract period. ESPCs use private financing to leverage the funds in Federal Agencies' budgets. ESPCs can be long term contracts up to 25 years. When the contract period is over, the Agency gets all of the improvements and savings resulting from the investment.
- A UESC is similar to an ESPC but with a utility. With a UESC, the utility typically arranges financing to cover the capital costs of the project. Then the utility is repaid over the contract term from the cost savings generated by the energy efficiency measures, often with the utility bill. UESCs are sometimes fuel neutral and limited to the utility's geographical service area. They can accommodate smaller projects with shorter terms than ESPCs. Energy audits can also be performed by utilities.

Facility

- A facility means any building, installation, structure, or other property owned, operated by, constructed for, or leased to, the Federal Government. This includes a group of facilities at a single location or multiple locations managed as an integrated operation, and Contractor-operated facilities owned by the Federal Government. It may be a group of buildings or structures that share the same servicing energy and water utilities so that utility data can be aggregated easily.
- A covered facility is one that is in the highest 75 percent of energy use or Gross Square Footage (GSF) measured at the Department level.

Greenhouse Gas (GHG)

- CO_2, CH_4, SF_6, N_2O, PFCs, HFCs (and other synthesized gases) and other natural or man-made gases in the atmosphere that absorb and emit radiation within the thermal infrared range.
- Scope 1 GHG – direct, produced by fuel combustion or owned vehicles.
- Scope 2 GHG – indirect, emissions of utilities for purchased electricity.
- Scope 3 GHG – indirect, emissions from business travel, waste disposal, contractor owned vehicles, outsourced activities, product use, and production of purchased materials. Scope 3 is not included in EO 13423 goals.

Hazardous Chemicals

- Hazardous chemical means any material that is regulated as a hazardous material by 49 Code of Federal Regulations (CFR) 173, requires a Material Safety Data Sheet (MSDS) per 29 CFR 1910.1200 or has components which will meet the definition of Hazardous Waste in 40 CFR 261.

Mercury-containing products

- Switches, thermostats, relays, flame sensors, button cell batteries, manometers, psychrometrs/hygrometers and non-fever thermometers.

NEPA

- The National Environmental Policy Act (NEPA) requires that Federal agencies consider the potential impacts of their actions on the environment. (7 CFR 520)

Operation and Maintenance (O & M)

- O&M costs include utilities, facility operations, janitorial, communications, administrative support facility, and repair and maintenance. Utility costs are a function of energy and water efficiency and conservation.
- Asset Management is tracking annual operating costs in CPAIS.

Ozone Depleting Compounds

- Any substance designated as a Class I or Class II substance by the Environmental Protection Agency (EPA) in 40 CFR Part 82. Chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), Freon (refrigerant) and Halon (fire suppressant) are ozone depleting. Hydrofluorocarbons (HFCs) are ozone friendly but some HFCs are greenhouse gases.
- Use of CFC refrigerants is banned unless they are required for maintenance of equipment not cost effective to replace or if no other product will satisfy the Agency's mission. HCFC refrigerants are to be phased out. Use of Halon fire suppressants is not allowed.

Recycling

- Recycling is the reprocessing of materials into new products. Recycling generally prevents the waste of potentially useful materials, diverts waste from landfills, and reduces the consumption of raw materials and energy usage in manufacturing, and hence greenhouse gas emissions, compared to virgin production.

Recycled Products

- Use EPA Comprehensive Procurement Guidelines to purchase recycled content products with the highest recovered material content practicable.
- Recovered material means waste material and by-products which have been recovered or diverted from solid waste, particularly postconsumer solid waste, but this term does not include those materials and by-products generated from, and commonly reused within, an original manufacturing process.

- Postconsumer content means a material or product that has served its intended use and has been discarded for disposal by the final user.

Renewable Energy

- Renewable Energy is energy produced by solar (heat or photovoltaic), wind, biomass, landfill gas, hydrokinetic, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.

Sustainable Building Inventory

- 15 percent of the Agency's buildings are to be sustainable by FY 2015. For the purposes of this requirement, sustainable means incorporating the Five Guiding Principles.

Sustainable Design – Five Guiding Principles

- Sustainability is defined as the ability to meet present needs without compromising those of future generations. Sustainable also means to create and maintain conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations.

- For the purposes of defining sustainability as it applies to the requirement to have 15 percent of existing buildings sustainable and sustainable new construction and major renovations, sustainable means incorporating the Five Guiding Principles of the Sustainable High Performance Buildings Memorandum of Understanding. The Five Guiding Principles are:
    1. Use integrated design and commissioning
    2. Optimize energy efficiency using measurement and verification
    3. Protect and conserve water
    4. Enhance indoor environmental quality
    5. Reduce the environmental impact of materials in Federal buildings.

  See APPENDIX 4 for a detailed explanation of the Five Guiding Principles.

Sustainable Leasing

- Sustainable leasing includes encouraging energy and water conservation and the use of environmentally preferable products. Sustainable leases:
    - requires materials that are recycled, bio-based, or have other positive environmental attributes
    - minimizes the consumption of resources, energy, and water
    - reduces the creation of solid waste, air pollution, or water pollution

- promotes the use of non-toxic substances and the avoidance of toxic materials/processes, or ozone depleting compounds
- requires that all utilities be metered
- encourages the use of renewable energy

Water Conservation

- Water Efficient Product or Service means a product or service that uses less water than competing products or services that serve the same purpose including those meeting EPA's WaterSense standards. Water used should be returned or disposed of un-degraded in quality or uncontaminated to the greatest extent possible. Reusing water and treating water before disposal are conservation strategies.
- Water is often considered the cheap utility, too inexpensive for conservation to be financially worthwhile. However, water is costly in many ways. Its use depletes aquifers, requires energy for pumping and heating, chemicals for treatment, staffing to operate treatment and wastewater treatment plants, and disposal can result in sewer charges. By using water efficiently, we can save money, protect water sources, improve water quality, and reduce the amount of energy used to treat, pump, and heat water.
- Large water consumers are deionized/reverse osmosis (DI/RO) water generators, evaporative coolers, cooling towers, fish tanks, and irrigation.

WaterSense^{SM}

- WaterSense^{SM} is an EPA program and label to indicate water conserving products and organizations.

30 percent more energy efficient than ASHRAE 90.1-2004

- EPACT 2005 requires new Federal buildings to be designed to be 30 percent more energy efficient than required by ASHRAE 90.1-2004 if life cycle cost effective. 71 FR 70275 states that if the additional 30 percent energy savings is not life cycle cost effective, an agency must evaluate the cost effectiveness of alternative designs at successive decrements below 30 percent (e.g., 25 percent, 20 percent, etc.) in order to identify the most energy efficient design that is life cycle cost effective for that building, however the building must remain compliant with ASHRAE 90.1-2004.

5. Management Infrastructure

- As required by Executive Order 13423, REE will identify a Senior Agency Official. The Senior Agency Official shall be the Deputy Administrator for Administration and Financial Management (DAAFM). The lines of authority will follow the established Agency organizational structure.

- REE will also identify an Energy Manager to establish and provide guidance to a REE Facilities Energy and Water Conservation and Utilities Management Team. Members of the team will represent broad areas of procurement, transportation, and other field and management functions. Areas and locations will identify an energy manager for each facility.
- To ensure widespread involvement of REE employees in meeting REE goals the following management tools are suggested:
    - Awards and other employee incentive programs to recognize employees for exemplary work in carrying out the Agency's energy management plan, EPACT 2005, the EISA of 2007, and EO 13423.
    - Performance plans of all employees with duties related to the energy management plan, EPACT 2005, the EISA of 2007, and EO 13423 shall include elements describing these duties and responsibilities.
    - Training and outreach on the Agency's energy management plan, EPACT 2005, the EISA of 2007, and EO 13423 shall be provided to all employees and contractors.
- Supporting policies, action plans (APs), standard operating procedures (SOPs) and standards will be established, maintained, and followed by all levels of the Mission Area to carry out the REE Energy Water and Sustainability Plan, EPACT 2005, the EISA of 2007, and EO 13423.

6. Assessing REE Status

The position of REE in relation to the requirements of EPACT 2005, the EISA of 2007, and EO 13423 will be assessed. The following elements will be included:

- Energy intensity in terms of British Thermal Units (BTUs) per GSF
- Water consumption and nature of its use
- Extent of advanced and standard metering of electricity, natural gas, steam, and other utilities
- Confirmation that new building designs are 30 percent more energy-efficient than ASHRAE 90.1-2004 subject to the DOE rule
- The utilization of self generated and purchased renewable energy
- The sustainability of the existing inventory of buildings
- Recycling and reduction of waste
- Use of recycled products
- Use of Energy Star® and FEMP designated energy-efficient products
- Use of bio-based products
- Reduction of ozone depleting compounds
- Use of beneficial landscaping
- Use of The Five Guiding Principles
- O&M and preventive maintenance practices
- Use of EPEAT

7. Framing strategies for low or no cost compliance with EPACT 2005, the EISA of 2007, and EO 13423

O & M strategies will include the following:

- Install and utilize advanced metering to identify energy and water saving opportunities
- Perform re-commissioning, retro-commissioning, and constant commissioning to optimize the performance of equipment and systems
- Enable Energy Star® functions and energy savings capabilities of equipment
- Take advantage of low or no cost conservation measures (See APPENDIX 3)
- Assure that appropriate preventive maintenance is performed, especially to preserve warranty rights.
- Ensure contracting requirements must contain energy and water conservation measures and sustainability
- Assure that facilities managers understand the energy and water conservation features present in their facilities and if they are functioning optimally.
- Ensure that alternative utility procurement will be utilized to the greatest extent possible to reduce costs including:
    - Defense Energy Support Center (DESC). DESC is a branch of the Department of Defense (DOD) that procures energy for DOD. DESC will also procure utilities for civilian agencies using a request for proposal (RFP). In addition to electricity and natural gas, DESC can procure fuel oil, diesel, gasoline, biodiesel, E85, etc.
    - GSA. GSA will compete with utilities for Agencies using a reverse auction. GSA charges a fee.
    - Utilize third party suppliers. When multiple suppliers are available in deregulated states compete and procure utilities at the lowest price.
    - Use GSA area-wide contracts to procure utilities in regulated states.
    - Bulk propane is available on the GSA schedule. See GSA Schedule 73, Category 655 01 Propane, http://www.gsaelibrary.gsa.gov/ElibMain/SinDetails?scheduleNumber=73&executeQuery=YES&specialItemNumber=655+01.
    - Utilize demand response programs where able.

Energy Awareness activities will include the following:

- Outreach to provide information within and outside ARS using written, on-line, and personal contact.
- Appropriate training will be provided for all employees and contractors.
- Area and location will develop appropriate energy awareness activities.

Sustainability certification methodologies/measurement tools including the following will be employed:

- LEED is a rating system by the US Green Building Council (USGBC). New buildings shall be constructed to meet or exceed the equivalent of LEED silver. In house certification may be utilized as long as at least 5 percent of new construction and major renovations are formally registered, documented, and certified.

- Green Globes is a rating system by the Green Building Institute (GBI). Two globes is approximately equivalent to LEED silver.
- Laboratories for the 21st Century (Labs 21) is a joint effort of the EPA and DOE.
- Energy Star® Buildings is a tool developed by the EPA. It may be used where there is a category available for the building type being considered.

8. Perform energy/water use audits and re-commissioning/retro-commissioning

Energy audits will be performed including the following:

- Prioritize and perform a preliminary walk through
- Gather building information, equipment information, utility bills, weather data, previous energy audits, etc.
- If indicated, perform further investigations
- Identify energy savings opportunities and implement them. Energy conservation measures identified in the energy audit must be implemented within two years.
- Take advantage of energy auditing services of utilities and municipalities.
- Energy and water surveys must be performed by the area/location Facility Energy Manager on 25 percent of covered facilities each year so that all covered facilities are surveyed in a four year period. Energy and water surveys of covered facilities must include re-commissioning or retro-commissioning.
- If the initial assessment walk-through finds that the building does not require a more detailed commissioning effort, then it should be documented and the commissioning requirement is fulfilled. If the initial assessment walk-through finds that the building is an economically viable candidate for further commissioning, additional energy/water-related O&M and optimization opportunities should be identified and documented along with detailed recommendations of remedial measures as well as expected cost to implement and savings. More capital-intensive retrofit opportunities may be identified and passed forward for detailed evaluation.
- Commission all new facilities.
- For new buildings and equipment, perform a walk through before the end of the warranty period to identify issues that must be addressed under the warranty.

9. Investigate building component energy and water saving opportunities and rank

Opportunities for energy savings and water conservation will be investigated and prioritized based on cost effectiveness, available resources, and funding availability including the following items:

- Building Envelope
- Heating, Ventilation, and Air Conditioning (HVAC) Systems - Reduce Ventilation Rates where allowable
- HVAC Distribution Systems - Reduce Distribution System Energy Losses
- Water Heating Systems

- Lighting
- Power and Load Management Systems
- Energy Management Control Systems and Metering
- Information Technology Systems
- Distributed Generation
- Water Conservation
- Cogeneration/Combined Heat and Power (CHP)
- Renewable Energy

10. Estimate the investment required to comply with EPACT 2005, the EISA of 2007, and EO 13423

Estimates will be prepared of the costs to comply with the energy and water conservation requirements of EPACT 2005, the EISA of 2007, and EO 13423. The following steps will be included:

- Determine target reduction
- Prioritize investments
- Adjust priorities based on availability of funds, return on investment, and other factors

11. Identify facilities that are likely to house the greatest energy savings opportunities and prioritize investments

Estimates will consider the total investment required and the return on investment to determine the best opportunities for savings including the following:

- Compare energy intensity reduction to investment cost based on consumption per GSF.
- Use life cycle cost methodologies. Justification will be based on a cost benefit analysis resulting in a ten year payback period or better.
- Adjust plans as opportunities arise or improvements are accomplished.

12. Identify similar facilities that can benefit from similar efforts

Information, success stories, and case studies will be developed and disseminated as part of the outreach and training program.

- Share information on energy savings opportunities or first time efforts between facilities.
- Select facilities for investigation and investment based on the ability to replicate results.
- Group facility improvements by use, systems, size, location, energy use/intensity, function, age, and other pertinent criteria.
- Determine a template or suite of energy efficiency opportunities that might apply to several facilities.

13. Track utility costs

- Verify utility bills, preferably prior to payment, but do not incur late fees.
- Meter utilities and read meters
- Analyze billing or consumption anomalies for energy or cost savings opportunities. The Government should not be taxed on utilities.
- Work with utilities to find the most favorable rate schedule, minimize consumption and demand, and participate in demand-side management programs.
- Verify billing accuracy and track historical trends with at least monthly data. Separate by building to the extent possible.
- Establish automated cost tracking methods
    - Network metered data
    - CPAIS
    - Telephone and Utility Maintenance System (TUMS) or successor systems
    - Use other new methods to capture costs. Consider manual efforts.

14. Provide access to energy savings expertise to Areas and locations

- Explore the use of a Resource Efficiency Manager (REM)
    - A REM may be the Facility Energy Manager for a facility or group of facilities.
- Provide in-house engineering expertise
- Energy Awareness communications and references
    - Provide Web based resources
    - Provide periodic informational messages
    - Conduct training and presentations

15. Identify sources of funding to accomplish energy savings projects

The following funding sources will be pursued:

- Appropriated funds
- UESCs
- ESPCs
- Utility demand-side incentives and rebates
- Retained energy cost savings or avoided costs
- Tax incentives for contractors
- At least 20 percent of Agency energy consumption costs must be spent on energy improvements and at least half of that 20 percent must utilize UESCs and ESPCs. UESCs shall be pursued first because UESCs are usually faster, easier, less expensive, and more flexible than ESPCs. ESPCs shall be utilized where UESCs are not available.

16. Monitor progress

- Report progress towards targets semi-annually for Office of Management and Budget (OMB) Scorecards and annually for the Annual Energy Management report.
- Provide for automated energy reporting including
    - CPAIS
    - DOE EISA mandated Web based reporting
- Revise plans based on progress, success, and changing priorities

APPENDIX 2
References and Acronyms

References

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http://www.afm.ars.usda.gov/shem/files/ARS%20EMS%20Implementation%20Guide.pdf

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https://arsnet.usda.gov/sites/AFM/FD/EA/default.aspx

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www.gsa.gov/autochoice

GSA Advantage Environmental Aisle
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http://www.wbdg.org/design/conserve_water.php

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Acronyms

AFM – Administration and Financial Management
AFV – Alternative Fuel Vehicle
AO – Administrative Officer
APD – Acquisition and Property Division
APD/APOB – Acquisition and Property Division/Acquisition Programs & Oversight Branch
ARS – Agricultural Research Service
ASHM – Area Safety and Health Manager
ASHRAE – American Society of Heating Refrigeration and Air Conditioning Engineers
CFC - Chlorofluorocarbon
CFR – Code of Federal Regulations
CHP – Combined Heat and Power
CH_4 – Methane
CIO – Chief Information Officer
CO_2 - Carbon Dioxide
CPAIS – Corporate Property Automated Information System
DAAFM – Deputy Administrator for Administration and Financial Management
DAD – Deputy Area Director
DESC – Defense Energy Support Center
DI/RO – De-ionized and Reverse Osmosis water
DOE – Department of Energy
EMS – Environmental Management System
EO – Executive Order
EPA – Environmental Protection Agency
EPACT 2005 – Energy Policy Act of 2005
EPEAT – Electronic Product Environmental Assessment Tool
ESCO – Energy Service Company
ESPC – Energy Saving Performance Contract
FAST – Federal Automotive Statistical Tool
FC – Foot Candles
FCB – Facilities Contracting Branch
FEB – Facilities Engineering Branch
FEM – Facilities Energy Manager
FEMP – Federal Energy Management Program
FR – Federal Register
FY – Fiscal Year
GHG – Greenhouse Gas
GSA – General Services Administration
HCFC - Hydrochlorofluorocarbon
HFC - Hydrofluorocarbon
HQ – Headquarters

HVAC – Heating Ventilation and Air Conditioning
Labs 21 – Laboratories for the 21st Century
LED – Light Emitting Diode
LEED – Leadership in Energy and Environmental Design
LPG – Liquid Propane Gas or Liquid Petroleum Gas
NEPA – National Environmental Policy Act
NEV – Neighborhood Electric Vehicle
N_2O – Nitrous Oxide
OCIO – Office of the Chief Information Officer
OFEE – Office of the Federal Environmental Executive
OMB – Office of Management and Budget
P&P – Policy and Procedure
PAO – Procurement Assistant Officer
PFC - Perfluorocarbon
R&M – Repair and Maintenance
REE – Research Education and Economics
REM – Resource Efficiency Manager
RPMB – Real Property Management Branch
SF – Square Feet
SF_6 – Sulfur Hexafluoride
SHEMB – Safety Health and Environmental Branch
SMACNA – Sheet Metal and Air Conditioning Contractors National Association
TUMS - Telephone & Utilities Maintenance System
TV – Television
UESC – Utility Energy Service Contract
USDA – United States Department of Agriculture
VCR – Video Cassette Recorder
VOC – Volatile Organic Compound

Appendix 3
Low Hanging Fruit – Low or No Cost Actions

Occupant conservation actions:

- Turn off lights, office equipment, and window air conditioners when not in use.
- Reduce the use of elevators. Walk down two flights or up one flight instead of using elevators.
- Keep windows/doors shut in areas that are being heated or cooled.
- Close blinds, shades, and drapes at night during the heating seasons to reduce heat loss through the window area. Open them during the day to use the sun for heating the rooms.
- Close blinds, shades, and drapes during the day in summer. These interior shading devices can reduce heat gain in the room as much as 50 percent.
- Implement a hood sash management program.
- Minimize overtime work. Consolidate work areas of after-hours workers to minimize the amount of space that must be heated, air conditioned, and lighted.
- If rooms are individually controlled by thermostats, keep temperatures above 76^{o} F in the summer and below 70^{o} F in the winter.
- Avoid the use of fans and space heaters if the building HVAC systems are operating.
- Do not block HVAC air distribution outlets with books, furniture, etc.
- Reduce plug loads by not leaving equipment plugged in that draws a trickle current such as chargers, TVs, VCRs, etc.
- Keep energy conservation awareness a priority by way of staff meetings, newsletters, posters, etc.

Facility managers O&M conservation actions:

- Institute and emphasize energy conservation awareness programs for building occupants by publishing/announcing actions indicated above.
- Perform inspections of the facility to determine compliance with temperature and lighting criteria, condition of equipment, piping and controls, and the need for repair. Make repairs promptly. Track and confirm repairs.

- Do not add heat to keep buildings warmer than 55 ^{o}F when unoccupied in the heating season.

- Keep the building envelope, equipment, and systems properly maintained to promote efficient operation of HVAC systems.

- Keep temperatures between 65 ^{o}F and 70 ^{o}F in the heating season and between 76 ^{o}F and 80 ^{o}F in the cooling season, where practicable (41 CFR 101).

- Do not cool buildings when unoccupied except as required, to achieve target temperature ranges during occupied hours in extreme weather conditions.

- Review building operating plans and tailor start-up and shut-down times of HVAC systems so that target temperature ranges are met within 1 hour of occupants arriving and departing the building, taking into account outdoor temperatures.

- Reduce the operating hours of HVAC, ventilation, water heating, and lighting systems, along with escalators, elevators, equipment, and machines.

- Lower humidification/raise dehumidification set points.

- Install locking thermostats where necessary to prevent unauthorized settings.

- Reduce water temperatures to lavatories, consistent with good hygiene.

- Install timers and/or occupancy sensors, as appropriate, to cut off lights and equipment automatically.

- Use energy-efficient fluorescent lamps. Replace incandescent light bulbs with compact fluorescent lamps. Select replacement lamps with high Color Rendering Index (CRI) lamps and reduce number of lamps where lighting level will be adequate.

- Participate in load-shedding programs of electric utilities.

- Clean lighting fixtures and replace lamps (with energy efficient lamps) on a regular maintenance schedule to maintain proper lighting levels.

- Reduce lighting levels during working hours to 50 foot-candles (fc) at work station surfaces, 30 fc in general office space not at work station surfaces, and 10 fc in non-work areas, in conformance with 41 CFR 101. Eliminate unnecessary lighting. Turn lights off when not in use. Occupants in areas with computers and video display terminals may benefit from lower lighting level using parabolic fixture lenses - refer to Illuminating Engineering Society publications for guidance.

- Adjust system and equipment settings hourly, daily, weekly, or seasonally to obtain the most energy-efficient operation, based on weather conditions and the system characteristics.

- Install and maintain weather-stripping on all doors and windows.

- Use EPEAT when purchasing electronics. Purchase Energy Star or FEMP designated energy-efficient products. Enable Energy Star features on electronics.

- De-energize vending machine lighting and install Vendmisers.

- Replace standard belts with cogged belts.

- Install night setbacks and occupancy sensors.

  Perform preventive maintenance and cleaning of HVAC equipment on a regular basis including filter replacement. Keep outside equipment free of plants, debris, and other obstructions.

- Commuting: Encourage and provide accommodation for employees to walk, bicycle, use public transportation, and car pool. Request a nearby bus stop from local transit if available. Study a shuttle for often driven routes.

Energy conservation retrofit actions:

- Reduce heat conduction through ceilings, roofs, floors, and walls by installation of insulation and vapor barriers.

- Reduce solar heat gain through roofs by installing reflective roof surfaces.

- Reduce heat conduction and long-wave radiation through glazing areas by installing storm windows or multiple glazed windows, by insulating movable windows, or by installing operable windows.

- Control solar heat gain through glazing areas by use of shading, tinted or reflective glazing or films, or by installing air-flow windows, or window screens with reflective/insulating characteristics.

- Reduce infiltration by caulking, weather-stripping doors and windows, or by constructing vestibules.

- Improve HVAC equipment efficiency (i.e., chiller, boiler, furnace, etc).

- Replace T-12 fluorescent lights and magnetic ballasts with T-8 lamps and electronic ballasts.

- Replace incandescent exit signs with LED exit signs.

- Reduce energy used for tempering supply air by installing Variable Air Volume systems, or by resetting supply air, hot water, or chilled water temperatures.

Vehicles

- Fleet Mix: Acquire fuel efficient vehicles to meet mission requirements when new acquisition is justified. These vehicles should be of the minimum size, weight, and options necessary to complete the mission requirements of the Agency. Acquire hybrids when available in the size and type needed.
- Acquire AFVs: Acquire AFVs when the option is available in the size and type needed.
- Acquire NEVs when appropriate for the job.
- Coordinate Vehicle Use: Employ trip planning, pooling, redistribution of vehicles, and other methods of achieving the best utilization of vehicles. Promote ride sharing to reduce petroleum fuel usage by REE employees and contractors where appropriate. Use the most fuel efficient vehicle that will accomplish the mission. Substitute cars for light trucks, increase vehicle load factors, decrease vehicle miles traveled and decrease fleet size.
- Maintenance: Establish internal procedures for effective preventive maintenance programs in accordance with manufacturer's standards, including regular tune-ups, wheel alignments, and keeping tires inflated to the pressure designated on the vehicle.
- Use of Alternative Fuels: Routinely obtain alternative fuels unless these fuels are not reasonably available or unless the fuels cost 15 cents more per gallon than petroleum fuel, based on an official EPACT waiver.
- Track/Monitor vehicle operational costs: Ensure vehicle operational costs are tracked and properly recorded in USDA's personal property system.
- Operator Training: Implement a program to keep operators alert to fuel efficient driving and operation techniques. This educational effort should include such actions as reminding drivers to drive at posted speed limits, avoid sudden bursts of speed, refrain from tailgating or pumping the accelerator pedal while the vehicle is not in motion, not idling the engine for long periods of time, eliminating unnecessary weight in the trunk or truck bed, and encourage pooling and combining of travel needs.

Appendix 4

THE FIVE GUIDING PRINCIPLES

Based on the High Performance and Sustainable Buildings Guidance
http://www.wbdg.org/pdfs/hpsb_guidance.pdf

A. GUIDING PRINCIPLES FOR SUSTAINABLE NEW CONSTRUCTION AND MAJOR RENOVATIONS

I. Employ Integrated Design Principles

Integrated Design. Use a collaborative, integrated planning and design process that:

- Initiates and maintains an integrated project team as described on the Whole Building Design Guide <http://www.wbdg.org/design/engage_process.php> in all stages of a project's planning and delivery.

- Integrates the use of OMB's A-11, Section 7, Exhibit 300: *Capital Asset Plan and Business Case Summary*.

- Establishes performance goals for siting, energy, water, materials, and indoor environmental quality along with other comprehensive design goals and ensures incorporation of these goals throughout the design and lifecycle of the building.

- Considers all stages of the building's lifecycle, including deconstruction.

Commissioning. Employ commissioning practices tailored to the size and complexity of the building and its system components in order to verify performance of building components and systems and help ensure that design requirements are met. This should include an experienced commissioning provider, inclusion of commissioning requirements in construction documents, a commissioning plan, verification of the installation and performance of systems to be commissioned, and a commissioning report.

II. Optimize Energy Performance

Energy Efficiency. Establish a whole building performance target that takes into account the intended use, occupancy, operations, plug loads, other energy demands and design to earn the ENERGY STAR® targets for new construction and major renovation where applicable. For new construction, reduce the energy use by 30 percent compared to the baseline building performance rating per the American National Standards Institute (ANSI)/ASHRAE/Illuminating Engineering Society of North America (IESNA) Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential. For major renovations, reduce the energy use by 20 percent below pre-renovations 2003 baseline.

Laboratory spaces may use the Labs21 Laboratory Modeling Guidelines. Use ENERGY STAR® and FEMP-designated Energy Efficient Products, where available.

On-Site Renewable Energy. Per the EISA Section 523, meet at least 30 percent of the hot water demand through the installation of solar hot water heaters, when lifecycle cost effective.
Per EO 13423, implement renewable energy generation projects on Agency property for Agency use, when lifecycle cost effective.

Measurement and Verification. Per the EPACT of 2005, Section 103, install building level electricity meters in new major construction and renovation projects to track and continuously optimize performance. Per EISA Section 434, include equivalent meters for natural gas and steam, where natural gas and steam are used.

Benchmarking. Compare actual performance data from the first year of operation with the energy design target, preferably by using ENERGY STAR® Portfolio Manager for building and space types covered by ENERGY STAR®. Verify that the building performance meets or exceeds the design target, or that actual energy use is within 10 percent of the design energy budget for all other building types. For other building and space types, use an equivalent benchmarking tool such as the Labs21 benchmarking tool for laboratory buildings.

III. Protect and Conserve Water

Indoor Water. Employ strategies that in aggregate use a minimum of 20 percent less potable water than the indoor water use baseline calculated for the building, after meeting the EPAct 1992, Uniform Plumbing Codes 2006 and the International Plumbing Codes 2006 fixture performance requirements. The installation of water meters is encouraged to allow for the management of water use during occupancy. The use of harvested rainwater, treated wastewater, and air conditioner condensate should also be considered and used where feasible for non-potable use and potable use where allowed.

Outdoor Water. Use water-efficient landscape and irrigation strategies, such as water reuse, recycling, and the use of harvested rainwater, to reduce outdoor potable water consumption by a minimum of 50 percent over that consumed by conventional means (plant species and plant densities). The installation of water meters for locations with significant outdoor water use is encouraged.

Employ design and construction strategies that reduce storm water runoff and discharges of polluted water offsite. Per EISA Section 438, to the maximum extent technically feasible, maintain or restore the predevelopment hydrology of the site with regard to temperature, rate, volume, and duration of flow using site planning, design, construction, and maintenance strategies.

Process Water. Per the EPACT of 2005 Section 109, when potable water is used to improve a building's energy efficiency, deploy lifecycle cost effective water conservation measures.

Water-Efficient Products. Specify EPA's WaterSense-labeled products or other water conserving products, where available. Choose irrigation contractors who are certified through a WaterSense labeled program.

IV. Enhance Indoor Environmental Quality

Ventilation and Thermal Comfort. Meet ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy, including continuous humidity control within established ranges per climate zone, and ASHRAE Standard 62.1-2007, Ventilation for Acceptable Indoor Air Quality.

Moisture Control. Establish and implement a moisture control strategy for controlling moisture flows and condensation to prevent building damage, minimize mold contamination, and reduce health risks related to moisture.

Daylighting. Achieve a minimum daylight factor of 2 percent (excluding all direct sunlight penetration) in 75 percent of all space occupied for critical visual tasks. Provide automatic dimming controls or accessible manual lighting controls, and appropriate glare control.

Low-Emitting Materials. Specify materials and products with low pollutant emissions, including composite wood products, adhesives, sealants, interior paints and finishes, carpet systems, and furnishings.

Protect Indoor Air Quality during Construction. Follow the recommended approach of the Sheet Metal and Air Conditioning Contractor's National Association Indoor Air Quality Guidelines for Occupied Buildings under Construction, 2007. After construction and prior to occupancy, conduct a minimum 72-hour flush-out with maximum outdoor air consistent with achieving relative humidity no greater than 60 percent. After occupancy, continue flush-out as necessary to minimize exposure to contaminants from new building materials.

Environmental Tobacco Smoke Control. Implement a policy and post signage indicating that smoking is prohibited within the building and within 25 feet of all building entrances, operable windows, and building ventilation intakes during building occupancy.

V. Reduce Environmental Impact of Materials

Recycled Content. Per Section 6002 of the Resource Conservation and Recovery Act (RCRA), for EPA-designated products, specify products meeting or exceeding EPA's recycled content recommendations. For other products, specify materials with recycled content when practicable. If EPA-designated products meet performance requirements and are available at a reasonable cost, a preference for purchasing them shall be included

in all solicitations relevant to construction, operation, maintenance of or use in the building. EPA's recycled content product designations and recycled content recommendations are available on EPA's Comprehensive Procurement Guideline Web site at <www.epa.gov/cpg>.

Bio-based Content. Per Section 9002 of the Farm Security and Rural Investment Act (FSRIA), for USDA-designated products, specify products with the highest content level per USDA's bio-based content recommendations. For other products, specify bio-based products made from rapidly renewable resources and certified sustainable wood products. If these designated products meet performance requirements and are available at a reasonable cost, a preference for purchasing them shall be included in all solicitations relevant to construction, operation, maintenance of or use in the building. USDA's bio-based product designations and bio-based content recommendations are available on USDA's Bio-Preferred Web site at <www.usda.gov/biopreferred>.

Environmentally Preferable Products. Use products that have a lesser or reduced effect on human health and the environment over their lifecycle when compared with competing products or services that serve the same purpose. A number of standards and eco-labels are available in the marketplace to assist specifiers in making environmentally preferable decisions. For recommendations, consult the Federal Green Construction Guide for Specifiers at <www.wbdg.org/design/greenspec.php>.

Waste and Materials Management. Incorporate adequate space, equipment, and transport accommodations for recycling in the building design. During a project's planning stage, identify local recycling and salvage operations that could process site-related construction and demolition materials. During construction, recycle or salvage at least 50 percent of the non-hazardous construction, demolition, and land clearing materials, excluding soil, where markets or onsite recycling opportunities exist. Provide salvage, reuse, and recycling services for waste generated from major renovations, where markets or onsite recycling opportunities exist.

Ozone Depleting Compounds. Eliminate the use of ozone depleting compounds during and after construction where alternative environmentally preferable products are available, consistent with either the Montreal Protocol and Title VI of the Clean Air Act Amendments of 1990, or equivalent overall air quality benefits that take into account lifecycle impacts.

B. GUIDING PRINCIPLES FOR SUSTAINABLE EXISTING BUILDINGS

I. Employ Integrated Assessment, Operation, and Management Principles

Integrated Assessment, Operation, and Management. Use an integrated team to develop and implement policy regarding sustainable O&M.

- Incorporate sustainable O&M practices within the appropriate EMS

- Assess existing condition and operational procedures of the building and major building systems and identify areas for improvement

- Establish operational performance goals for energy, water, material use and recycling, and indoor environmental quality. Ensure incorporation of these goals throughout the remaining lifecycle of the building

- Incorporate a building management plan to ensure that operating decisions and tenant education are carried out with regard to integrated, sustainable building O&M.

- Augment building O&M as needed using occupant feedback on work space satisfaction.

Commissioning. Employ re-commissioning tailored to the size and complexity of the building and its system components in order to optimize and verify performance of fundamental building systems. Commissioning must be performed by an experienced commissioning provider. When building commissioning has been performed, the commissioning report, summary of actions taken, and schedule for re-commissioning must be documented. In addition, meet the requirements of EISA 2007, Section 432 and associated FEMP guidance.

Building re-commissioning must have been performed within four years prior to reporting a building as meeting the *Guiding Principles*.

II. Optimize Energy Performance

Energy Efficiency. Three options can be used to measure energy efficiency performance:

- Option 1: Receive an ENERGY STAR® rating of 75 or higher or an equivalent Labs21 Benchmarking Tool score for laboratory buildings

- Option 2: Reduce measured building energy use by 20 percent compared to building energy use in 2003 or a year thereafter with quality energy use data

- Option 3: Reduce energy use by 20 percent compared to the ASHRAE 90.1-2007 baseline building design if design information is available.

Use ENERGY STAR® and FEMP-designated Energy Efficient Products, where available.

On-Site Renewable Energy. Per EO 13423, implement renewable energy generation projects on Agency property for Agency use, when lifecycle cost effective.

Measurement and Verification. Per the EPAct of 2005, Section 103, install building level electric meters to track and continuously optimize performance. Per the EISA 2007, the utility meters must also include natural gas and steam, where natural gas and steam are used.

Benchmarking. Compare annual performance data with previous years' performance data, preferably by entering annual performance data into the ENERGY STAR® Portfolio Manager. For building and space types not available in ENERGY STAR®, use an equivalent benchmarking tool such as the Labs21 benchmarking tool for laboratory buildings.

III. Protect and Conserve Water

Indoor Water. Two options can be used to measure indoor potable water use performance:

- Option 1: Reduce potable water use by 20 percent compared to a water baseline calculated for the building. The water baseline, for buildings with plumbing fixtures installed in 1994 or later, is 120 percent of the Uniform Plumbing Codes 2006 or the International Plumbing Codes 2006 fixture performance requirements. The water baseline for plumbing fixtures older than 1994 is 160 percent of the Uniform Plumbing Codes 2006 or the International Plumbing Codes 2006 fixture performance requirements.

- Option 2: Reduce building measured potable water use by 20 percent compared to building water use in 2003 or a year thereafter with quality water data.

Outdoor Water. Three options can be used to measure outdoor potable water use performance:

- Option 1: Reduce potable irrigation water use by 50 percent compared to conventional methods.

- Option 2: Reduce building related potable irrigation water use by 50 percent compared to measured irrigation water use in 2003 or a year thereafter with quality water data.

- Option 3: Use no potable irrigation water.

Measurement of Water Use. The installation of water meters for building sites with significant indoor and outdoor water use is encouraged. If only one meter is installed, reduce potable water use (indoor and outdoor combined) by at least 20 percent compared to building water use in 2003 or a year thereafter with quality water data.

Employ strategies that reduce storm water runoff and discharges of polluted water offsite. Per EISA Section 438, where redevelopment affects site hydrology, use site planning, design, construction, and maintenance strategies to maintain hydrologic conditions during development, or to restore hydrologic conditions following development, to the maximum extent that is technically feasible.

Process Water. Per EPAct 2005 Section 109, when potable water is used to improve a building's energy efficiency, deploy lifecycle cost effective water conservation measures.

Water-Efficient Products. Where available, use EPA's WaterSense-labeled products or other water conserving products. Choose irrigation contractors who are certified through a WaterSense-labeled program.

IV. Enhance Indoor Environmental Quality

Ventilation and Thermal Comfort. Meet ASHRAE Standard 55-2004 Thermal Environmental Conditions for Human Occupancy and ASHRAE Standard 62.1-2007: Ventilation for Acceptable Indoor Air Quality.

Moisture Control. Provide policy and illustrate the use of an appropriate moisture control strategy to prevent building damage, minimize mold contamination, and reduce health risks related to moisture. For façade renovations, Dew Point analysis and a plan for cleanup or infiltration of moisture into building materials are required.

Daylighting and Lighting Controls. Automated lighting controls (occupancy/vacancy sensors with manual-off capability) are provided for appropriate spaces including restrooms, conference and meeting rooms, employee lunch and break rooms, training classrooms, and offices. Two options can be used to meet additional daylighting and lighting controls performance expectations:

- Option 1: Achieve a minimum daylight factor of 2 percent (excluding all direct sunlight penetration) in 50 percent of all space occupied for critical visual tasks.

- Option 2: Provide occupant controlled lighting, allowing adjustments to suit individual task needs, for 50 percent of regularly occupied spaces.

Low-Emitting Materials. Use low emitting materials for building modifications, maintenance, and cleaning. In particular, specify the following materials and products to have low pollutant emissions: composite wood products, adhesives, sealants, interior paints and finishes, solvents, carpet systems, janitorial supplies, and furnishings.

Integrated Pest Management. Use integrated pest management techniques as appropriate to minimize pesticide usage. Use EPA-registered pesticides only when needed.

Environmental Tobacco Smoke Control. Prohibit smoking within the building and within 25 feet of all building entrances, operable windows, and building ventilation intakes.

V. Reduce Environmental Impact of Materials

Recycled Content. Per section 6002 of RCRA, for EPA-designated products, use products meeting or exceeding EPA's recycled content recommendations for building modifications, maintenance, and cleaning. For other products, use materials with recycled content such that the sum of postconsumer recycled content plus one-half of the pre-consumer content constitutes at least 10 percent (based on cost or weight) of the total value of the materials in the project. If EPA-designated products meet performance requirements and are available at a reasonable cost, a preference for purchasing them shall be included in all solicitations relevant to construction, operation, maintenance of or use in the building. EPA's recycled content product designations and recycled content recommendations are available on EPA's Comprehensive Procurement Guideline Web site at <www.epa.gov/cpg>.

Bio-based Content. Per section 9002 of FSRIA, for USDA-designated products, use products with the highest content level per USDA's bio-based content recommendations. For other products, use bio-based products made from rapidly renewable resources and certified sustainable wood products. If these designated products meet performance requirements and are available at a reasonable cost, a preference for purchasing them should be included in all solicitations relevant to construction, operation, maintenance of or use in the building. USDA's bio-based product designations and bio-based content recommendations are available on USDA's Bio-Preferred Web site at <www.usda.gov/biopreferred>.

Environmentally Preferable Products. Use products that have a lesser or reduced effect on human health and the environment over their lifecycle when compared with competing products or services that serve the same purpose. A number of standards and eco-labels are available in the marketplace to assist specifiers in making environmentally preferable decisions. For recommendations, consult the Federal Green Construction Guide for Specifiers at <www.wbdg.org/design/greenspec.php>.

Waste and Materials Management. Provide reuse and recycling services for building occupants, where markets or on-site recycling exist. Provide salvage, reuse, and recycling services for waste generated from building O&M, repair and minor renovations, discarded furnishings, equipment and property. This could include such things as beverage containers and paper from building occupants, batteries, toner cartridges, outdated computers from an equipment update, and construction materials from a minor renovation.

Ozone Depleting Compounds. Eliminate the use of ozone depleting compounds where alternative environmentally preferable products are available, consistent with either the

Montreal Protocol and Title VI of the Clean Air Act Amendments of 1990, or equivalent overall air quality benefits that take into account lifecycle impacts.