USDA Forest Service
FY 2008 Annual Report on Energy Management
12/8/2008

This report documents the Forest Service's accomplishments and activities in support the agency's goal toward a more energy efficient and sustainable organization. The report consists of information collected from multiple sources, including the USDA National Finance Center, Headquarters Office Staffs, and Agency field units. The Forest Service has implemented a new, innovative approach to collecting place-based information for this and other related reports. Through the use of online survey tools, the Forest Service is able to analyze the responses in real time. With a focus on continual improvement, the Agency looks forward to building upon this effort in the future and refining the type and quality of information received. The information included herein incorporates 153 responses from across the Forest Service, including Regional Offices, National Forests, Research Stations and Laboratories. Many of the units included impressive success stories, some of which have been incorporated into appropriate sections of this document. The complete list of reported success stories, by field unit, is included as Appendix A of this report.

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

A. Energy Management Infrastructure

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

The Agency's senior energy official is Hank Kashdan, Deputy Chief for Business Operations. Mr .Kashdan's role is to provide executive leadership and oversight for the Agency's energy management team and the Sustainable Operations Council.

In addition to the official delegation at the Deputy Chief level, the Chief of the Forest Service has also identified "Climate Change" as one of the top themes/challenges for the foreseen future. Chief Kimbell has stated, "History will judge the conservation leaders of our age, including our own leadership in the Forest Service, by how well we respond to these challenges." One of the ways in which the Agency will address this challenge is through our own operations. Effective energy management and conservation is one direct means of reducing green-house gases, a known factor in climate change.

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

The Agency's cross-functional energy team is the Sustainable Operations Council. The Council was developed to provide executive leadership and oversight for all of the Agency's efforts in Sustainability, not limited to just energy. This executive council will develop policies and procedures to help the Agency achieve its sustainable operations goals in a collaborative manner. The Forest Service is working to identify a small group of line officers and subject matter experts to serve on the Council.

The Forest Service also participates in the USDA Facilities Work Group, a subcommittee of the USDA Asset Management Council (formerly the USDA Real Property Council). The Facilities Work Group is responsible for developing inter-agency policy proposals in the areas of: energy efficiency; water conservation; waste diversion/recycling; and sustainable design and high performance buildings.

There are currently 78 established green teams within the Forest Service located throughout the country at all levels of the organization. Last year, there were 31. These teams train and implement place-based efforts that reduce energy use and improve overall sustainable operations.

B. Management Tools

1. **Awards (Employee Incentive Programs).** Describe the agency's use of employee incentive programs to reward exceptional performance in implementing Executive Order 13423. (See *Instructions for Implementing Executive Order 13423*, Section I, part D(5), http://www.ofee.gov/eo/eo13423_instructions.pdf.)

   The Chief has a Sustainable Operations award that covers four categories-individual, group, partnership and unit.

   Approximately 19% of those reporting state that their unit gives awards for implementing sustainable operation initiatives. Last year, 12% reported they provided incentive.

   Several Regional Offices have also established awards for sustainable operations or similar activities such as "Engineer of the Year."

2. **Performance Evaluations.** Describe agency efforts to include successful implementation of provisions of Executive Order 13423 in the position descriptions and performance evaluations of senior energy officials, members of the agency energy team, heads of field offices, and facility/energy managers. (See *Instructions for Implementing Executive Order 13423*, Section I, part D(4)).

   The Agency has added the following requirement in the "Mission Results" performance element for all managerial and supervisor positions: "Ensures sustainable operations and consumption to utilize energy efficiently in daily operations. Creates initiatives and activities that demonstrate resources are managed to reduce the Agency's overall environmental footprint."

   Of the units that reported in the data request, approximately 30% have already incorporated this element into performance plans.

3. **Training and Education.** Describe activities undertaken to ensure that all appropriate personnel receive training for energy management requirements. This reporting is required by a section of Energy Policy Act of 1992 (42 U.S.C. § 8262c) that is still in effect. (Note: The expenditures and number of employees trained will be reported on the agency's Data Report.) Describe agency outreach programs that include education, training, and promotion of ENERGY STAR® and other energy efficient and low standby power products for Federal purchase card users.

   In November of 2008 the Northeast Region hosted the third National Sustainable Operations Summit implemented as a video conference in Washington D.C. These annual summits have been opportunities for employees across the Forest Service to network and share information, success stories, and discuss barriers towards across all footprint areas. This summit included approximately 200 participants including Forest Service and other Federal and State Agency Partners.

   The Forest Service requires LEED certification on certain types of new buildings. In order to meet this requirement, LEED certified professional designers must be used. Several Regional Facilities Engineers have attended training and received this accreditation.

   Regional Offices are responsible for training staff to implement required program elements. Some have incorporated sustainable operations training into their future Environmental Management Systems' training program where applicable. Of the reporting units that submitted a response for this element in 2008, approximately 4% have had some type of training for all appropriate personnel in energy management. This is an opportunity for tremendous improvement, both at local levels and in Regional Offices.

II. ENERGY EFFICIENCY PERFORMANCE.

This section will highlight data calculated for reporting on the Data Report and the Energy Scorecard. The purpose of the section is to provide narrative information in support of these data as well as showcase particular agency initiatives and projects contributing to the goals of EPACT '05 and E.O. 13423.

A. Energy Intensity Reduction Performance

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

The Forest Service energy use is shown in table 1-1, the intensity equivalent to 42,648BTU/GSF[1]. The data represents a reduction of 33% in energy intensity compared to the Agency's 2003 baseline of 64,027 BTU/GSF. Energy use data for the Forest Service for FY 2003 and FY 2007 are compiled by a USDA contractor. The data originated in the USDA National Finance Center (NFC) and Purchase Card Management System (PCMS) and is limited by the controls and architecture applied in these systems.

2. **Excluded Facilities.** Refer to Section IV (B) of this guidance—a list of excluded facilities and an explanation of why they were excluded. (Refer to DOE's *Criteria Guidelines Establishing Criteria for Excluding Buildings from the Energy Performance Requirement,* See: http://www.eere.energy.gov/femp/pdfs/exclusion_criteria.pdf.) These guidelines fulfill the requirement under Section 543(c)(3) of NECPA as amended by EPACT '05. Section 543(c)(3) states that the Secretary of Energy shall issue guidelines that establish criteria for exclusions from the energy performance requirement for a fiscal year, any Federal building or collection of Federal buildings, within the statutory framework provided by the law. These guidelines were developed through an interagency working group process under the auspices of the Federal Interagency Energy Management Task Force which subsequently concurred with the final product.

   There are currently no facilities excluded from the intensity calculation. Where appropriate in the future, excluded facilities, especially those, "Assumed Excluded", as defined in the FEMP guidelines with minimal energy use such as toilet buildings, will be considered for removal from the energy calculations. The Forest Service is evaluating the implementation of a tool to assist in national differentiation between buildings with high energy intensity and those with little to no energy use.

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

   Data on Non-fleet vehicles and equipment fuel use is limited due to the processes used to purchase it. There is currently no central repository for this information. The following methods, and strategies have been implemented to reduce fuel use in both fleet and non-fleet vehicles and equipment:
   - Distribution, through websites, of fuel-saving tips for vehicle use
   - Preparation of training materials to support fuel conservation

   Records of bulk fuel use required for fuel consumption reporting in 2008 will assist in accurately reporting non-fleet and equipment fuel use. Wider distribution of fuel-saving tips in 2009 will help reduce non-fleet and equipment fuel use.

[1] This information is based on initial data provided by USDA and is subject to change. The USDA Office of Procurement and Property Management will update this data and narrative when revised data becomes available.

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

B. Renewable Energy. Discuss agency's policy and efforts to encourage purchase and generation of electricity and thermal energy from renewable energy sources. The quantitative information related to this section will be reported on the agency's Data Report which incorporates the new counting methodology for renewable energy (electricity only, old vs. new). More details on the changes to renewable energy reporting are contained in the *FEMP Renewable Energy Requirement Guidance for EPACT 2005 and Executive Order 13423*, available on FEMP's website: http://www.eere.energy.gov/femp/.

In FY 2007, the Forest Service drafted new directives for reviewing and approving special use authorizations on NFS lands involving wind energy projects. In addition to this newly drafted policy, 22 reporting units state that they have alternative energy sources under special use authorizations. Below is a sampling of these sources and the approximate amount of energy generated:

Administrative Unit	Type of Project and Amount of Energy Generated (if known)
Beaverhead-Deerlodge NF	Elkhorn Hotsprings Resort utilizes geothermal to heat it's lodge and one rental cabin. Elk Lake Resort utilizes solar for its electrical needs, I would guess it generates around 2000 kWh.
Dakota Prairie Grasslands	Solar power to range water wells
Bighorn NF	Summer Home use, hydro and solar
Arapaho and Roosevelt NF & Pawnee NG, Region Two	FS solar water system (Dutch George CG), solar interpretive center (Dos Chappel Nature Center), other solar uses under special use permit.
Shoshone NF	solar
White River NF	Wind, Solar, Micro Hydro
PSICC	Hydropower; approximately 29 MW/year
Carson NF	solar powered communications sites and solar powered telemetry for oil and gas well outputs
Gila NF	Grazing allotments approximately 30 kwh
Prescott NF	Solar
Bridger-Teton NF	small hydro - 20,000 kwh
Dixie National Forest	Hydro and solar
Sawtooth NF	Hydroelectric. Unknown KWH's generated.
Humboldt-Toiyabe NF	Geothermal, 90 mega watts
Sequoia NF, Region 5	very small amount for communications

Malheur NF, Region 6	Small hydropower plant for a single residence.
Mt. Hood National Forest	Hydro - PGE, Eugence Electrict;
Colville NF	solar at communications sites
Superior National Forest	Sawbill Resort generates wind power
White Mountain NF	hydro permit (1) and some minor solar and wind applications by permittees.

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

   There are many self-generated renewable energy projects being implemented or continued across National Forest System Lands.

   In the Rocky Mountain Region, eight 90 watt photovoltaic panels and one 75 watt photovoltaic panel installed at Trappers Lake provide power for a remote water distribution system serving 60 campsites. The panels operate a 400 watt well pump and a chlorinator pump. Estimated annual energy generated is 155KWh/year.

   In the Intermountain Region, the Ashley National Forest (UT) installed a solar powered lighting system throughout the Colton Guard Station. The project replaces the propane fueled lighting fixtures. The Ashley also installed a similar system at the Trout Creek Guard Station. Additionally the Boise National Forest installed a solar powered well pump that also provides DC power to a host site.

   On the Kisatchie National Forest (LA) in the Southern Region, a biomass project is underway for the Winn District Ranger Office. The project will install a BioMax®25(kW) gasifier that uses wood chips as fuel. The fuel will operate a generator to take the place of utility supplied power to the building.

   The Alaska Region continues to use six solar/wind/battery powered units for remote sites providing 835 KWh/season.

   The following chart represents what field units reported for types of self-generated renewable energy sources they have under operation. These sources represent approximately 40,000 kWH.

Energy Type	**Total Units by Source**	**WO**	**R/S/A**	**Units**
Wind	4			4
Solar	41		2	37
Biomass	5			1
Landfill gas	0			
Geothermal	1			1
Hydro/Ocean	3			3

Not generating power from alternative sources	99	2	20	83

2. **Purchased renewable energy.** Summarize agency purchases of renewable energy in the form of Renewable Energy Certificates RECs or as part of competitive power purchases. Discuss highlights of major purchases and approaches taken to obtain renewable energy through purchases.

   In addition to the Renewable Energy Credits(RECs) purchased by USDA, the Forest Service also purchased the following renewable energy to offset the overall energy use of the Agency:

   The Forest Service Headquarters purchased 15% of its energy use through a REC as part of the entire USDA complex; the Rocky Mountain Region purchased a 5 year REC agreement for 550 MWH per year sourced by wind and biomass fuels; the Ozark St. Francis National Forest (AR) purchased more than 50,000 KWH from a wind based "new" renewable source; the Forest Products Lab (WI) purchased more than 14,000 KWH/year from a wind based "new" renewable source, the San Bernardino purchases 18% of their power from Solar and wind, The San Juan NF purchases 1200kwh/yr from wind, the medicine bow purchases an unknown amount from solar, the Okanagan NF produces an unknown amount from hydro power and the Rocky Mountain Research Station produces an unknown amount from Geothermal.

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

   The Forest Service estimated water consumption is listed in Table 1-1. The FY 2007 water consumption baseline is 29.8 gallons per gross square foot. In 2008, the amount of water increased by 10.2% to 32.83 gal/GSF. This consumption is based solely on those municipal potable water systems that are metered and for which the Agency pays a fee. It does not include any non-metered drinking water systems such as Agency-owned wells at administrative sites. Water usage and cost data for the Forest Service for FY 2008 was compiled by a USDA contractor. The data originated in the USDA National Finance Center (NFC) and Purchase Card Management System (PCMS) and is limited by the controls and architecture applied in these systems. The Agency plans to investigate approaches to track water use at Agency-owned wells and other drinking water sources that are non-metered at this time.

   Many of the Agency's water conservation activities are captured in the Success Stories section of Appendix A.

D. Metering of Electricity Use. EPACT '05, Section 103, requires all Federal agencies to install metering and advanced metering where found to be cost-effective, according to guidelines developed by DOE (refer to: http://www1.eere.energy.gov/femp/pdfs/adv_metering.pdf). Agencies are required to install standard or advanced meters at all Federal buildings to the maximum extent practicable, by October 1, 2012 and were to submit implementation plans to accomplish this in August 2006. Agencies are required to report on their progress as part of their annual input to the DOE Report to Congress beginning with FY 2007. Progress will be measured based on the number of buildings metered and the percent of agency electricity consumption represented by those buildings. The quantitative information related to this section will be reported on the agency's Data Report in Table 2-4. Starting with FY 2008, agencies will be required to report progress on both buildings with standard meters and buildings with advanced meters. Agencies should describe progress made in FY 2008 in meeting the milestones of their metering implementation plans.

The Forest Service estimates that approximately 4500 buildings are currently metered either internally or by the local utility with standard meters. This represents an estimated 50% of the buildings that units report have electricity service. In FY 2008, the Forest Service is moving forward with implementation of the Agency's metering plan. The Agency recognizes that there is tremendous value in implementing a consistent approach to advanced metering across the nation. In support of this, the Forest Service funded a project through the Missoula Technology and Development Center (MTDC) in Spring, 2007. MTDC is reviewing available advanced meters and software, preparing to install these meters at three pilot sites, and will evaluate the results in 2008. The project description and latest status for this project is attached as Appendix C to this report.

Until such a time that the metering program is completely implemented, local field units are taking other steps to minimize energy use. One of the most effective current means of evaluating energy use is through reviewing utility bills. These efforts not only inform decision-makers of the total costs and locations of high energy intensity, but can also identify inconsistencies such as incorrect rates, sites not used by the Agency, and so forth. Nearly 70% of the reporting units identify that they have some level of review of their utility bills. The Forest Service sees this as an area for improvement in the future.

1. **E. Federal Building Energy Efficiency Standards.** EPACT '05, Section 109, requires that new Federal buildings be designed to achieve energy consumption levels that are at least 30 percent below the levels established in the ASHRAE Standard or the International Energy Conservation Code, as appropriate, if life-cycle cost-effective. DOE published the Interim Final Rule for new Federal building energy efficiency standards in the Federal Register, Vol. 71, No. 232, December 4, 2006, 70275.

A template for listing new Federal building designs and construction has been added as a new worksheet to the Annual Energy Management Data Report workbook.

The following new, potentially energy-intense, Forest Service owned buildings were in design during FY 2007-08.Through implementation of the LEED design and certification process, the Forest Service anticipates that these buildings will meet or exceed the new Federal building efficiency standards where applicable and life-cycle cost-effective:

Region/ Station	Forest/ Station	Project Name	Size (GSF)	Bldg. Type (Category/Subcat)	Design Year
1	IPNF	Sandpoint RD office	12,000	Office	2007/08
3	Lincoln	Sacramento Ranger Station	10,249	Office Building	2007
3	Prescott	Verde Ranger Station	7,942	Office Building	2007
5	17	Truckee Dist. Office	11,000	Office/Office	2007
6	1	Sisters RD (new)	11,300	Office/Office	2007
8	NFs in TX	NFs in TX Supervisors Off	17,000	Office	2007
8	Chat-Oco	Chattooga River RD Off	7,500	Office	2007
8	FM/S	Francis Marion RD Off	9,700	Office	2007
8	NFs in NC	Appalachian RD Off	7,000	Office	2007
9	Shawnee	Vienna	16,464	admin facilities	2006-2007
9	Wht MTN	Wht Mtn Admin Phase I, II, III	47,740	admin facilities	2006-2007
FPL		Fire Research Laboratory Addition (FPL Modernization Phase 3)	6,000	Lab	2007

1 IMPLEMENTATION HIGHLIGHTS OF FY 2007. The purpose of this section is to identify and describe results and accomplishments to reduce energy consumption and improve energy efficiency. It is not expected that each agency will have employed every strategy; rather, the strategies identified below are intended to remind agency officials of the existence of these strategies and to encourage their use where practical and life-cycle cost effective. Agencies should provide highlights of the following strategies their energy management programs employed during FY 2008:

- Life-Cycle Cost Analysis
- Retrofits and Capital Improvement Projects
- Use of Performance Contracts
  - Energy-Savings Performance Contracts (ESPCs)
  - Utility Energy Services Contracts (UESCs).
- Use of ENERGY STAR® and Other Energy-Efficient Products
- Sustainable Building Design and High-Performance Buildings
- Energy Efficiency/Sustainable Design in Lease Provisions
- Distributed Generation, including combined cooling, heating, and power systems

Refer to Appendix A of this report for specific success stories that address the strategies above. Additionally, the Forest Service has taken the actions below in support of these efforts.

The Forest Service recognizes the importance of considering the entire life-cycle cost in making decisions. For this reason, the Agency has funded the Missoula Technology and Development Center (MTDC) to do an analysis of the LCCA tools available from Whole Building Design Guide. Considering the Agency's decentralized nature, specific types of facility construction, and various other nuances, MTDC will propose one of the LCCA tools as the Agency's approach to LCCA. The Washington Office will evaluate this and incorporate this into policy as appropriate.

In late FY 2007, the USDA issued the Sustainable Building Implementation Plan (SBIP). This document facilitates compliance with the requirements of EO 13423. The Forest Service will incorporate the SBIP into its operations thereby ensuring that Forest Service buildings will conform to the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings.

The Bessey Ranger District Office in Halsey, Nebraska, is the Forest Service's first building to be LEED certified at the Silver Level. This project helps pave the way toward building more energy and water efficient, comfortable and sustainable structures that will provide long lasting benefits for years to come. Appendix B of this document provides more detail into the development of this building.

In 2009, four more buildings are being constructed that will be LEED certified with a Silver Rating. These include;

1) White Mountain National Forest Administrative Complex located in Region 9 in New Hamsphire.
2) Watersmeet Ranger Station District Office and Administrative Site in Watersmeet ,MI.
3) Baldwin District Office and White Cloud District Office Administrative Sitein Baldwin, MI
4) Multi-Use Laboratories part of the Fire Research Lab at the Forest Products Laboratory at Madison, WI.

ESPC

Rocky Mountain Region: During the summer of 2007, a DOE contractor performed an Initial Proposal to help move the Rocky Mountain Region towards meeting Energy/Water Conservation and Renewable Energy Use Goals from the EO 13423 "Strengthening Federal Environmental Energy and Transportation Management" and the Energy Policy Act of 2005. The Initial Proposal was developed to include the following areas:

1. Lighting retrofits and replacements
2. Water conservation
3. Vending machine energy conservation
4. Renewable wind power
5. Photovoltaic measures
6. Biomass – heating
7. Biomass – power plant
8. Dead meter survey

If the initial proposal were implemented exactly as developed, the potential reductions would be on the magnitude of 1,700 MWh of electricity use, or 15% or the total Regional use.

The Rocky Mountain Region expects to receive their Detailed Energy Study (DES) in December 2007. At that time, the Forests will review the DES to determine which projects to take forward to implementation, which is the work included in Phase 1. Next, the Region will address in Phase

2 to address the energy savings that results from deferred maintenance upgrades, i.e. window replacements, HVAC replacements, etc.

Initial ESPC Kickoff -- 2 Regions were engaged.
Initial ESPC Proposals - 1 Region has received; 1 Region is awaiting the delivery from an ESCO.
Detailed Energy Study - Region 2 to be delivered in Dec. 2007
Other interested units that have not initiated ESPC efforts - all remaining Regions, FPL, Northeast Area, NE Research and Job Corps.

The Intermountain Region has piggy-backed onto the Region 2 pilot contract. They expect to receive the Initial Proposal for Energy Savings in January 2008.

The Corvallis Forestry Sciences Lab entered into an ESPC contract with DOE/Honeywell in June 1999 for a 10 year contract. It involved replacing light fixtures, installing an energy management system and steam heat efficiency retrofits. We are into our 9th year and have realized $48,100 in cumulative savings beyond the guaranteed savings of $598,536 to date.

Region 2 has entered into a Region-wide ESPC in FY2008 for eleven National Forests, and debt service payments will start in January, 2009.

Energy Management Plans

Of the 8% of units that reported having an active Energy Management Plan the following were the types of activities included in these plans, by organizational level.

	Life-cycle cost analysis	Facility Energy Audits	69	Use of ENERGY STAR and other products	ENERGY STAR Buildings	Sustain-able Building Design	Energy efficiency in lease provisions	Distributed generation	Industrial facility efficiency improve-ments	Highly efficient systems	Electrical load reduction measures
Total	9	25	13	33	6	17	18	0	6	21	16

Energy Audits

Approximately 14% of the reporting units completed an energy and/or water audit in 2007. The table below summarizes the number of buildings audited and approximate costs to complete the audit:

Unit	How many buildings were audited?	How much money was spent? ($)
Totals	74	$8,296

III. DATA TABLES AND INVENTORIES. Include the items listed below in the order given.

A. FY 2008 Annual Energy Management Data Report. A blank Data Report form and instructions for completing the form are included as Attachment 3 of this Guidance. Also include Data Reports for revisions to past years' energy data along with an explanation

B. Excluded Facilities Inventory. This should include the following information: building

name, building location (city and state), and justification for excluded status under the criteria developed for EPACT '05: http://www.eere.energy.gov/femp/pdfs/exclusion_criteria.pdf.

The attached three spreadsheets represent data available to the Forest Service for energy use, generation, and associated activities. Where data is not available, approximations for the requested elements are provided. The Forest Service anticipates increased data quality in out year reports as the reporting formats become standardized.

See attached Excel spreadsheets with associated Forest Service energy data. Much of the data included was generated through a USDA contractor through the use of National Finance Center Data.

Appendix A- Success Stories

Sustainability Leadership – Success Stories

Forest Products Laboratory (FPL)	FPL has given time-off awards to staff for energy conservation measures they suggested and were implemented such as elimination of transformers that were no longer needed and reconfiguring how electric power and water are consumed by weatherometers (research equipment).
International Institute of Tropical Forestry (IITF)	IITF does not have a formal green team, however, there are professionals working with sustainable operations. Our LEED project for the Headquarters building has been going for 3+ years. It has the potential to be the number 1 FS historical building restored to silver lever and of over 12,000 sf. Also shall be including the site, a FS showcase project.
RMRS	A station Green Team was established that will work on issues affecting the everyone, with labs also establishing Green Teams for local issues.
Northern Research Station	We are starting to share information and compare strategies for achieving success. Sustainable operation practices are part of the building engineering staff performance objectives.
NRS-2 Warren Forestry Sciences Lab	The unit is represented on the NRS Green Team, but does not have a unit green team.
NRS-10 (FPL Madison)	Reduce energy consumption by surplusing old refrigerators and incubators, reducing use of fluorescent lights, reducing air conditioning costs by covering steam pipes with insulated rubber cover (thus reducing ambient heat in room in summer). Individually thermostated rooms turned down in winter and up in summer.
PNW	Q1 The staton PNW has implemented a green team that serves all of the labs. Q2 implemented in Supervisor Performance evals for FY 08
PNW - Wenatchee Forestry Sciences Lab	#2. The Implementation of sustainable operation practices as performance criteria was started for 2008.
Pacific Southwest Research Station	As is required by his position description, PSW's Coordinator of Research Planning and Reporting devotes 20% of his time to Sustainable Operations. Thus, his performance is determined, in part, by his ability to implement sustainable operations activities. In addition, and as is required nationally, all supervisors now have sustainable operations as a performance standard in Element I of their FY08 Performance Plan (Contact: Larry Rabin). PSW does not have awards for performing past sustainable operations activities. However, for the past 2 years, PSW Albany has funded 7 green microgrants across the Station each year. Green microgrants are fairly modest funds that are awarded to stimulate grassroots sustainable efforts on the ground. The microgrant approach enables Forest Service employees to decide which sustainable activities are most needed at their unit and apply for funding for those activities (Contact: Larry Rabin).
Pacific Southwest Research Station Headquarters	As is required by his position description, PSW's Coordinator of Research Planning and Reporting devotes 20% of his time to Sustainable Operations. Thus, his performance is determined, in part, by his ability to implement sustainable operations activities. In addition, and as is required nationally, all supervisors now have sustainable operations as a performance standard in Element I of their FY08 Performance Plan (Contact: Larry Rabin). PSW does not have awards for performing past sustainable operations activities. However, for the past 2 years, PSW Albany has funded 7 green microgrants across the Station each year. Green microgrants are fairly modest funds that are awarded to stimulate grassroots sustainable efforts on the ground. The

	microgrant approach enables Forest Service employees to decide which sustainable activities are most needed at their unit and apply for funding for those activities (Contact: Larry Rabin).
Riverside Forest Fire Lab	Unit provided awards to persons complete a sustainability survey through random draw. Unit provides on the spot nominal award of pin for sustainable acts seen by champion.
PSW SNRC Forestry Sciences Laboratory	Starting this year, supervisors will have a performance element dealing with sustainable operation practices.
SRS	We are a three person unit with minimal energy usage other than computer equipment and one fleet vehicle.
Alexandria Forestry Center Labs - Pineville, LA	Research, FHP and NFS personnel are on a sustainability team that looks at increasing energy efficiency and recycling. Contact: Les Groom
State and Private Forestry, Northeastern Area Headquarters	NA led the development of a chartered, joint, Northeastern Area/Northern Research Station Sustainable Operations Team in FY2007. NA Staff successfully raised the awareness of and obtained support from NA Leadership, positioning NA to take positive steps in FY2008.

Energy- Success Stories

Beaverhead-Deerlodge NF	A 4 kW grid-tied PV system with battery backup was installed in 2007 at our Madison Ranger Station.
Gallatin NF	We have incorporated the implementation of Executive Order 13423 into all supervisory position descriptions on our forest. New, more energy efficient windows were installed in 2007 at the GSA-operated federal building which houses our Supervisor's Office.
Bighorn NF	Energy efficient power strips, heating and cooling settings adjusted, new equipment enegery star equipment.
Medicine Bow-Routt NFs and ThunderBasin Natl GL	We have a new bunk house on the Douglas Distict that has motion lights and we have a new Solar powered water system in the Sandstone Work center.
Rio Grande NF	Efforts at reviewing electrical bills turned up a meter that was only used to power an electric gate. Gate was added to another meter so duplicate meter fees were eliminated. Contact: Lynn DiFiore
Arapaho and Roosevelt NF & Pawnee NG, Region Two	A few line officers are embracing change to reduce env. footprint.
Shoshone NF	per 19. - line and staff officers have had an performance measure added to performance elements. Contact Karin Lancaster.
White River NF	Several years use of micro-hydro and PV panels at Maroon Bells Site
Region 2 RO	(1) Much work was completed in FY 2006. (2) Under our lessor's own initiative, there are energy conservation measures that the lessor wants to undertake. However, timeframes for completion are currently unknown. *Region 2 (CO) continues to implement a multi-regional, management level Board of Directors to create a management climate that reduces barriers to sustainable operations efforts as well as integration of sustainable habits into Forest Service culture. In addition to Region 2 Line Officers and staff participation, the board has representatives from 3 other Regions, a Research Station, and the Washington Office. EPA acts as an advisory member and BLM is represented as well.*
PSICC	Modest-size (1600 s.f.) high-efficiency office placed into service at the

	Woodland Park Work Center. Incorporates daylighting, energy & water efficiency measures. Also, T-8 lighting retrofits completed at South Park District office in Fairplay, CO, and Pikes Peak District office in Colorado Springs, CO.
Coronado NF	We have solar power on some of our recreation toilet buildings to power lights and fans. A few of our newer owned and leased administrative buildings have lights on timers in restrooms, outdoor lights on photocells or on motion sensors
Region 3 RO	The Mogollon RD on the Coconino NF has been very cooperative in providing data regarding energy use, water use, and fleet costs. The District has been administratively consolidated for many years however the FS has not built a facility to consolidate the three geographically seperated offices. We are compiling data to show the costs associated with this mode of operation and potential to SAVE $$ with a little investment. Ben Martinez bsmartinez@fs.fed.us
Bridger-Teton NF	Solar wells at campgrounds and guard stations.Call Wayne Clayton @307-739-5445. Compostinfg of yard wastes, propane canister recycling, double sided printing, organic coffee, DeeDee Witsen 307-739-5400
Uinta National Forest	Our unit converted a historic guard station to solar power. The system is efficient and has reduced fire hazards associated with gas lighting.
Region 4 RO	In FY07, the RO Green Team surveyed employees regarding lighting in their workspaces. Many areas had more lighting than necessary, so the Green Team worked with GSA to turn off ballasts on the unneeded lights. Additionally, since GSA lighting efficiency upgrades won't take place until FY08, the RO purchased its own motion sensors for lights in common areas like supply and copy rooms. We have a LEED-certified architect in the RO design group.
Angeles NF	we provide paper recycling bins throughout the office, and collect paper waster for recycling. We collect used batteries for recycling and legal disposal through our hazmat coordinator.
Cleveland National Forest, R5	Forest received a microgrant to convert a fire station site from propane to solar power. This allowed the Forest to purchase solar panel.
Eldorado NF	The Placerville Nurser, with the help of the 2007 micro grant, installed "solo" tubes to light the interior of their public display room. Solo tubes utilize the sun for diffused interior lightening. The lighting that was replaced was extremely old and dangerous to replace.
Inyo National Forest	Lighting in the SO building has been improved to allow different levels of light in different areas, as well as timers with manual override option. Contact John Knox at (760)873-2529
Mendocino N.F., Region 5	The Alder Springs project on the MNF includes an analysis of metrics to evaluate the effectiveness of forest practices in the areas of carbon sequestration, biomass utilization for cogeneration and carbon emissions during wildfires. A Green MicroGrant supported the purchase of supplies to improve energy efficiency, including compact fluorescent bulbs, water heater blankets and kill-a-watt meters to raise awareness on energy use.
Six Rivers NF	Installation of solar equipment to generate electricity at a remote fire station that historically used diesel and propane generators.
Mt. Hood National Forest	Formation of Green Team to implement energy saving ideas across the Mt. Hood N.F Moving toward more fully utilizing the exisiting building spaces; Conveying empty buildings;
Colville NF	Although the 2-year old Republic District Office is not LEED certified,

	many "green" and energy efficient materials went into it's construction. Passive solar is used to help light and heat the building. The power company has given us energy credits for its use.
Cherokee National Forest	No suffnicant stories
Ozark-St. Francis National Forests	First LEED certified building in the Forest Service is the Sylamore District Office
Region 8 RO	Although we have no LEED building at this level, we lead the FS as a region with ten (10) LEED buildings currently in the design/or construction phase. Just this year we received the LEED Certification (first in the FS) for Sylamore RD Office project. Contact Person: Maurice Hoelting, Regional Architect at (404) 347- 2526
Chippewa National Forest	Question #2 Forest is source for biomass production but no biomass production is being done on forest. Question 19. This will be incoporated in all appropriate personnel performance plans per letter. Two sites have solar power. Both are remote.
Chippewa National Forest	have two solar power sites. One is a remote well. One is a remote street light.
Huron-Manistee National Forests	The use of solar power at 4 of our campgrounds to charge batteries to power water pumps. Diane Walker
Mark Twain National Forest	19. Forest has implemented EO 13423 wording into line/staff performance evaluations,
Shawnee NF	Increased our recycling efforts. All employees are participating in reducing the lights being on in the building. We cut the hallway lighting in half and turn off lights in conference rooms, break rooms, and restrooms when not in use. We completed a LEED office design for the Hidden Springs Ranger District Office (construction contract awarded 9/2007)
Wayne National Forest	A solar power system was installed in August of this year. This is a 3600 watt system, which operates at about 95% efficiency. This power goes directly into our consumption and with additional panels could eventually run our meter backwards at times.
Allegheny National Forest	Fluorescent Lights are being replaced with Energy Efficient T8 and T9 across the three offices. Employees have been instructed to activate the "Energy Star" saver on their PC. The Green Team has verified each office is in compliance with the thermostats setting for heating and cooling systems (78 degrees in summer, 68 during winter). POC Michael Shelvey, 814-728-6114.
White Mountain NF	The Forest has been using 50/50 biodiesel in our heavy equipment and support vehicles for several years. We have begun using bio heating fuel at 3 of our owned admin buildings this year. We have a fleet of 4 hybrid vehicles and are making efforts to improve energy efficiency at every opportunity.
Forest Products Laboratory (FPL)	FPL completed construction to correct deficiencies in 46 lab exhaust hoods in 4 buildings. Removed 60 fan motors from 2 buildings, combining their ductwork into a common plenum with 3 new exhaust fans on the roofs. The adjusted hood airflow saves energy by reducing the volume of conditioned air being exhausted. Annual energy savings: about $45,000 ($20,000 heat, $10,000 supply fan power, $10,000 exhaust energy, $5,000 air conditioning) FPL's old paper making machine was decommissioned by disconnecting an idle transformer in Building 29 that served the machine with 1,800 watts of power 24/7. Annual energy savings: $1,800
International Institute of Tropical Forestry	HQ building project submitted to White House Closing the circle award.

(IITF)	Project unofficially was selected as a FY08 year marked project.
RMRS Boise Lab	This building has around 5 tenants and 6 floors. The Forest Service owns our part of the building. It was built as a "Green Building" and has been recognized as such by the city.
RMRS, Missoula Fire Sciences Lab	Green Team formed for Missoula Forest Service Complex. We have only had 3 meetings thus far. We agree to try to use one contractor for jobs instead of 3 separate ones. We plan to purchase Vending Misers. Station Green Team formed.
Flagstaff Rocky Mountain Research	New performance standards n place for FY08 Establishment of Sustainable Operation Team
Northern Research Station	In 2007, our engineering staff implemented a system to save energy by turning off the air handlers at night, and on weekends and holidays. Since May, our monthly electrical use has declined 13 to 37% vs. the same month in FY 2006. Our steam use has declined 38 to 74% compared to the previous year. Our total cost savings since implementing this program amounts to $15,527. Our engineering staff replaced our incandescent lights with 23 watt fluorescent lights, resulting in our energy use declining from 11,100 kW per hour to .518 kW per hour.
NRS-Delaware Lab	installed insulated windows throughout main bldg. installed insulated vinyl siding t-12 ballasts installed in 1 bldg. replaced water coolers with energy star units recycling program
Forestry Sciences Lab,Rhinelander, Northern Research Station	During FY 07 we reduced energy costs approximately 15% despite rising supply costs by using schedule changes on HVAC equipment, using non-occupied setback temps, lowering water heater temps, and general use of task lighting in work areas
NRS-10 (FPL Madison)	Elimination and/or replacement of old incubators and refrigerators/freezers with Energy Star appliances.
Northern Research Station - HQ	Working with lessor to de-lamp fluorescent fixtures where possible. Re adjusting building thermostats for temp settings and reduced operational periods.
PNW - Anchorage	HVAC only runs during normal business hrs. Window film installed to cut solar heat gain. New compressor installed for more efficient heating and cooling. Employees are encouraged to shut down computers.
PNW - Wenatchee Forestry Sciences Lab	#19 Performance Appraisal statement: Ensures sustainable operations and consumption to utilitize energy efficiently in daily operations. Creates initiatives and activities that demonstrative resources are managed to reduce the Agency's overall environmenatl footprint.
PNW La Grande Forestry and Range Sciences Lab and	Performance evaluations added to the 08 standards. Energy Conservation Habits incorporated in business operations (equipment turn-offs, dup printers, recycle, etc.)
PNW Research Station, Corvallis Forestry Sciences Lab	Installed solar powered lights around some of the buildings at HJA experimental forest
PSW Institute of forest Genetics, Placerville	Our unit was awarded a micro grant for green activities. With this grant we have obtained a solar energy plan for the site with an emphasis on the greenhouse area; in particular the heating. The contact person is myself: Annette Delfino-Mix
Riverside Forest Fire Lab	Kill-a-watt devices have been purchased to allow monitoring at individual level through a microgrant. Unit made decision to convert lighting ballasts and lights this fiscal year following free energy audit.
GW Andrews Forestry Sciences Lab	We are currently registered for LEED-EB certification and are actively pursuing certification in FY08. Many retrofit projects, planning, audits, etc.

Athens Forestry Sciences Laboratory	Reduced water consumption by reducing water pressure thru out buildings. Barbara Mercer, 706-559-4222.
State and Private Forestry, Northeastern Area Headquarters	All NA supervisory staff have incorporated implementation of EO 13423 into their performance elements. Contact: Mark Buccowich
Grey Towers National Historic Site	Began installation of compact florescent light bulbs in 2006. Expanded in 2007. Reduced the energy use in two maintenance buildings in 2006.

Water Conservation - Success Stories

Forest Products Laboratory (FPL)	Local water utility provides cost avoidance by allowing FPL to redirect some of our clean process water from the sanitary sewer to the storm sewer. Through these efforts, 26,873 CCF of water was redirected in FY 2007. Total cost avoidance: $30,661. A pilot project was approved in 2007 to purchase and install waterless urinals and test the effectiveness of 2 units in a men's room. Annual water/sewer charge savings: $92. Waterless urinals will be installed in FPL's new Multi-Use Lab Building that is currently under construction. A pilot project was approved in 2007 to purchase and install dual-flush handles and test the effectiveness of 3 units in a women's room. Handles allow the option of a 1.1 GPF upward flush for liquid waste, or a 1.6 GPF downward flush for solid waste. An upward flush saves 30% water volume. Annual water/sewer savings: $138.
International Institute of Tropical Forestry (IITF)	Unit does not have a Water management Plan, however, conducts water management best practices.
RMRS, Missoula Fire Sciences Lab	We have replaced all of our toliets units with efficient mechanisms to conserve water useage.
Flagstaff Rocky Mountain Research	Reestablishment of native species which require no watering.
Forestry Sciences Lab,Rhinelander, Northern Research Station	We have replaced urinals and toilets with 1.6 gallon water use models, we use faucet aerators.
NRS-10 (FPL Madison)	Drinking fountain was disconnected for repair and never fixed! Autoclaves maintained for efficient use of water and steam.
PNW - Anchorage	Building mgmt recently installed auto flush valves on toilets and urinals (10 each, I believe).
Redwood Sciences Lab, PSW	All of our landscaping is native plants (we're pretty much in the forest). We do water some of them to encourage flowering but not a lot.
PSW SNRC Forestry Sciences Laboratory	During laboratory renovations, water saving toilets and urinals were installed.
Athens Forestry Sciences Laboratory	Reduced water use by reducing pressure. County in mandated water restrictions due to severe water shortage.
Grey Towers National Historic Site	Involved in the design of a new water distribution system for the GTNHS facility which will make the water system more functional, less prone to failure and utilize less purchased water. Recent landscape design which utilized native trees, plants & grasses that required less water use.

Appendix B- Fact Sheet for Bessey Ranger District Office- Silver LEED Certification

BESSEY RANGER STATION – First Silver LEED Certified Building in the Forest Service

US Forest Service, Rocky Mountain Region . Halsey, Nebraska

The Bessey Ranger District and Nursery Office in Nebraska is the first in the region to extensively apply Leadership in Energy and Environmental Design (LEED) principles along with The Built Environment Image Guide for the National Forests and Grasslands (BEIG). This project helps pave the way toward building more energy and water efficient, comfortable and sustainable structures that will provide long lasting benefits for years to come. The LEED rating system is organized into five environmental categories: 1) sustainable sites, 2) water efficiency, 3) energy and atmosphere, 4) materials and resources, and 5) indoor environmental quality. Features for each of these categories follow below.

Sites

- There are five spaces for storing bicycles and showers are available at the pool.
- An electric vehicle recharging station is provided.
- Preferred parking is provided for car or van pool and parking spaces were reduced.
- The building was oriented to preserve as many trees as possible. Additionally, strict construction limits were enforced to decrease site impacts related to the construction process.
- An area larger than twice the building footprint is designated as open space.
- The outdoor lighting has minimal impact to off-site activities.

Water Efficiency

- Potable water use is reduced by utilizing waterless urinals and low-flow plumbing fixtures. These fixtures reduce water used for potable water to 24,734 gallons per year; which is a 50 percent reduction of the amount expected in a similar building without water-reducing plumbing fixtures.

Energy and Atmosphere

- No CFC-based refrigerants were used in the HVAC systems.

Optimize Energy Performance

- The energy cost to operate the Bessey District/Nursery Office is estimated to be 45% less than a typical building.
- The roof and walls are insulated to a standard much higher than traditional buildings, and also sits on a concrete slab with two inches of insulation around the perimeter.

- The building is heated and cooled by two geothermal, ground coupled, heat pumps with backup electric resistant heating.

- Compact fluorescents, fluorescents, and task lighting are controlled by occupancy sensors, timers, dimmers, and daylighting controls.

- 100 percent of the building's electricity is provided from renewable sources for two years. Renewable energy comes from solar electric, wind, geothermal, biomass and small hydro facilities.

- By using renewable energy instead of fossil fuel generated electricity, the Bessey District/ Nursery Office eliminates approximately 94 tons of carbon dioxide, 560 pounds of sulfur dioxide, and 400 pounds of nitrogen oxide from being released into the air. It would take 14,400 trees to absorb 94 tons of carbon dioxide. This is equivalent to 37.6 acres of trees. Another way of looking at the emissions is that it is equivalent to eliminating the emissions produced by driving 310,000 miles in a car.

Materials and Resources

- Recycling space is provided inside the building to recycle paper, corrugated cardboard, glass, plastics, and metals. The Bessey District/Nursery Office could produce approximately 75 pounds of solid waste per day, most of which may be recycled.

- Of the 735 tons of waste generated during construction, demolition, and land clearing, 727 tons or 98 per cent was reused or recycled instead of sending to a landfill.

- Over 20 percent of the building materials and products were manufactured within a 500-mile radius of the building site. This supports local economies and reduces transportation costs.

Indoor Environmental Quality

- Carbon dioxide levels are monitored to provide an indication of indoor air quality.

- Increase level of thermal, ventilation, and lighting system control by individual occupants was provided to promote the productivity, comfort, and well-being of building occupants.

Appendix C- Status of Forest Service Metering Plan

We have 2 meters installed at MTDC and are in the process of getting them plugged into the internet. Anticipate receiving GE meter this week and will have that installed soon.
Now we have the issue of how to address or label the meters. MTDC has some static IP address in reserve for printers and the like that we could nab for internal tests, but it would be good to come up with a scheme that permits all to use the CommEXT Lite free software from EIG to see what our meters are recording.

We also turned a problem into an opportunity. One of the EIG meters at MTDC turned out to be a fair distance from the nearest wired data port, so I purchased a couple of components to form a wireless Ethernet bridge: a Lantronix WBG1000 on the meter end and a 3COM 3CRWE454G75 access point on the data port end. Both devices appear to have adequate data encryption capabilities. A technician at supplier's office suggested that we specify the MAC address of the Lantronix device in the 3COM's settings to prevent unauthorized access. I just received the wireless hardware and haven't installed either device near the meter yet.

Initial Project Proposal

The Forest Service is planning to install advanced electrical meters and advanced electrical metering systems (see definitions below) at buildings greater than 10,000 GSF in size. The Agency intends to collect this data on a predefined schedule and transmit it to a central data repository where it can be analyzed and opportunities for energy conservation identified. This system will support implementation of EMS, because it will provide consumption data that can be used to create a building footprint and to manage/reduce electricity consumption/carbon emissions. <u>This project is a subunit or subproject of the larger EMS effort and it is critical to implement a national metering approach to ensure it provides proper support to EMS.</u>

Advanced Meter – Those meters which have the capability to measure and record interval data (at least hourly) and communicate the data to a remote location in a format that can be easily integrated into an advanced metering system. At least daily collection capability is required.

Advanced Metering System – A system that collects time differentiated energy use data from advanced meters via a network system on either an on request or defined schedule basis. The system can provide energy use data on a daily basis and can support desired features and functionality related to energy use management, procurement, and operations.

PROPOSED TECHNOLOGY & DEVELOPMENT WORK (*Describe your concept of the end product, such as a new equipment design, a PowerPoint presentation, a video, a handbook, Web site, CD, etc.*):

This project will need to evaluate and identify best value/functionality for the acquisition of advanced meters, communication systems, and a software system. Specifically, the project will need to:

- Identify a list of 3-4 advanced meters that can be placed on Agency buildings

- Identify a list of communication systems to transmit data from the meter to a building computer
- Specify which meters are compatible with which meter-to-computer transmission system
- Specify methods from transmitting data from the computer to the server that serves as a central metering data repository.
- Identify who will provide servers, manage data and use this data and for what use.
- Identify analytic capabilities any specified software system must possess to adequately analyze data to characterize use, identify use reduction opportunities, display use over time, and any other identified capabilities
- Ensure that any equipment specified for this system – meter to computer, computer to server, software on server to EMS – are compatible and will operate as a seamless integrated system.
- Get involvement from IRM groups, in networking, servers. Who will manage this data collection system physically. Most large buildings have a USFS network in building to connect to metering systems.
- Get involvement from INFRA group to see if this data needs to be incorporated into infra database, and displayed. Who will integrate this data into this system?
- Data standards need to fit the end use of the data collection systems, then the hardware to support that needs to be meet that standard.
- Find out if USDA will eventually want to look at data for energy savings and what are there standards. If there are none and we go left and next year they want data, how will this be integrated?
- Figure out how can metering be installed physically as an add-on package to service or if power company meters can be replaced. Normally power companies own meters and won't let you just put yours in as its their revenue stream. This would be complicated as there are many utilities to deal with. To deal with each power company on each meter would be difficult. A separate package may be easier to implement.
- On larger buildings with BMS systems (Building management systems for HVAC control) there may be an interface to use the smart meter to have the BMS reduce energy consumption by peak demand or load shaving. This needs to be considered when looking at hardware. This is a second use of the smart meter that actually saves $$, not just inputs data into a database.

POTENTIAL BENEFITS (*Describe how this project will reduce cost, save time, improve safety, increase efficiency, or improve resource management*):

The metering system can serve as a key component of the energy reduction efforts. It will reduce energy cost by identifying energy conservation opportunities, improve building efficiency, and help the Agency characterize its ecological footprint. Data can be used to lower energy use and cost across the building inventory. The fully deployed metering system will provide consistent operational controls for managing one or more significant aspects in a national EMS template.