

DEPARTMENT OF THE INTERIOR

Energy Management Report Summary

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SECTION 1 – Management and Administration Summary

Agency Information

Agency U.S. Department of the Interior

Agency Contact(s) Mary Heying; Dan Collinge

Contact(s) Information Mary_Heying@ios.doi.gov; 202-254-5503
Daniel_Collinge@ios.doi.gov 202-254-5539

A. Energy Management Infrastructure

1. Senior Agency Official Rhea Suh

The Assistant Secretary - Policy, Management and Budget is the Department of the Interior's (Interior) Senior Sustainability Official responsible for meeting the goals of the Energy Policy Act of 2005, Energy Independence and Security Act of 2007 (EISA), Executive Orders (EO) 13423 and 13514.

2. Agency Energy Team

Implementation of the Energy Management and Conservation Program within Interior is the responsibility of the Assistant Secretary - Policy, Management and Budget and is delegated to the Office of Acquisition and Property Management through the Deputy Assistant Secretary – Budget, Finance, Performance, and Acquisition. Interior's Energy Management Team consists of Senior Bureau Asset Management Officers who are responsible for managing Interior's real property assets. In addition, the Departmental Energy Conservation Committee (DECC), comprised of bureau representatives ranging from property management specialists to engineers, is a forum to communicate information regarding energy management and water conservation issues; discuss best management practices; and provide advice and recommendations to senior leadership on energy management initiatives and policies as well as guidance on bureau energy management operations.

Departmental organizations and bureaus with responsibility for energy and water management at Interior facilities include the following:

- Office of the Secretary, National Business Center (NBC);
- Bureau of Indian Affairs (BIA);
- Bureau of Land Management (BLM);
- Bureau of Reclamation (BOR);
- National Park Service (NPS);
- U. S. Fish and Wildlife Service (FWS); and
- U. S. Geological Survey (USGS).

B. Management Tools

1. Awards

Interior bureaus take advantage of incentive programs to reward their exceptional employees. In addition, Interior actively participates in the Department of Energy's Federal Energy Management Program, "You Have the Power" awareness campaign, and the Federal Energy and Water Management Awards Program. Interior also holds its own Environmental Achievement Awards.

Four Interior nominations were recipients of five Department of Energy's FY 2011 Federal Energy and Water Management Awards:

- **U.S. Fish and Wildlife Service** – Assabet River National Wildlife Refuge in Sudbury, Massachusetts received a Project Award for their Visitor Center. Using passive solar architecture, a cool roof, daylighting, low-e glazed windows, energy-efficient fluorescent and LED lighting, occupancy sensors, a 12.5-ton geothermal ground source heat pump, and a 6.3-kW grid-tied solar photovoltaic (PV) array, the Visitor Center's energy performance is 30% better than an average building and saves 13.1 metric tons of greenhouse gases (GHG) annually. Indoor features include low-VOC carpets, paints, and adhesives, recycled materials such as 100% recycled paper countertops, a solar-powered trash compactor, and low flow water fixtures and waterless urinals. Outside, the use of wildlife-friendly native plants, a "no mow" lawn, stormwater containment with drainage swales, and porous pavement maximize water conservation. The total energy cost saved in 2010 was \$2,662.
- **U.S. Fish and Wildlife Service** – Benton Lake National Wildlife Refuge in Great Falls, Montana received a Project Award for their Hybrid Solar PV and Wind Energy System. Funded by the American Recovery and Reinvestment Act, the Refuge installed 15.4 kW of grid-tied solar PV panels and a 10 kW grid-tied wind turbine in 2009 to power its headquarters building. The building is super insulated, completely weatherized, has operable low-e windows, T-8 fluorescent lights with electronic ballasts, occupancy sensors, and LED exit lights, and employs passive solar energy strategies. In FY 2010, these integrated renewable energy systems accomplished a 93% decrease in electricity consumption and a 33% reduction in energy intensity from the field station's FY 2003 baseline, with a cost savings of approximately \$4,000 per year, an energy savings of 121 million BTUs, and 25 metric tons of GHGs avoided.
- **U.S. Fish and Wildlife Service** – San Francisco Bay National Wildlife Refuge Complex in Fremont, California received a Project Award for their Headquarters Office Renovation. Energy conservation features include passive solar technologies such as double-glazed light-bronze tinted low-e windows and doors with innovative thermal-break frames, expansive spray foam wall and ceiling insulation, LED and T-8 fluorescent lighting with electronic ballasts, occupancy sensors, daylighting, ENERGY STAR® appliances, and Water Sense low-water-use

plumbing fixtures that save 5,000 gallons per year. Renewable energy features include a solar-thermal collector with an interior heat reservoir that provides 100% of the domestic hot water. After renovation, the building consumes 52% (104 MWH) less energy and indirectly offsets approximately 72 metric tons of GHGs annually.

- **U.S. Fish and Wildlife Service** – Mr. David Guthrie, Energy Coordinator for the U.S. Fish and Wildlife Service, received two awards: an Exceptional Service Award and a Program Manager's Award.

For more than ten years, Mr. Guthrie has turned the U.S. Fish and Wildlife Service's Energy Management Program into a Federal leader, saving millions of BTUs of energy and millions of gallons of water. Mr. Guthrie's work has been vital to the Service's ability to maintain a GREEN OMB Energy Management Scorecard rating. He developed and maintained a unique Energy Database, drafted the Service's Carbon Mitigation Plan, and helped obtain millions of dollars in Green Energy and Recovery Act funding for energy efficiency, renewable energy, and water conservation projects. Through these and other accomplishments, Mr. Guthrie fulfills a critical role in enabling the Service to meet its goal of carbon neutrality in 2020, and for these efforts, Mr. Guthrie was selected for an Exceptional Service Award.

The prestigious Program Manager's Award is given to only one recipient each year, selected at the discretion of the FEMP Program Manager, for unique contributions to Federal energy management, water efficiency, fleet management, sustainable design, and/or use of renewable energy. The winner is chosen based on their strong commitment to energy management as well as the enormous, cross-cutting scope of work performed over many years. Mr. Guthrie's hard work, creativity, perseverance, and enthusiasm set an example for all Federal employees. His success is obvious from the 30 nominations he has submitted for FWS since 1998 that have won awards from FEMP. He is extremely active in promoting the Service's accomplishments through Federal recognition programs, helping to institutionalize best practices across the Service through outreach and education.

Among the winners of Interior's Environmental Achievement Awards were the below nominations focusing on energy management:

- **Bureau of Land Management** – Mr. Trent Duncan, Utah State Office, Bureau of Land Management, Utah, was named a Sustainability Hero for outstanding leadership and achievements in renewable energy, energy efficiency, sustainable design and implementation. Trent has assisted in the implementation of over 130 renewable energy projects ranging from small lighting systems to large off-grid and grid-connected system. Mr. Duncan managed the design and construction of three LEED projects. Through his leadership and tenacity, one project achieved a Gold Rating, one has a potential of Platinum, and the third facility anticipates Gold. He has also assisted in three leasing projects which have received LEED certification or are in the process. His efforts have been recognized numerous times by the Federal Energy Management Program, Department of Interior, the Bureau of Land Management and others.
- **National Park Service** – Park Management Team, John Day Fossil Beds National Monument, National Park Service, Oregon, received an award for Design and

Construction of Net-Positive Energy Housing. The Park Management Team at John Day Fossil Beds National Monument successfully pursued building an unconventional, state-of-the-art zero-energy home as a replacement for the ranger residence at the remote Painted Hills Unit.

- **U.S. Fish and Wildlife Service** – Turnbull National Wildlife Refuge - Inland Northwest Complex Headquarters, Washington, received an award. This super-insulated high performance facility is a model of sustainable design. The building was constructed using stone from a regional quarry, and includes a cool roof; daylighting; low-e glazed windows; efficient LED lighting; occupancy sensors; and a 14-ton geothermal heat pump, resulting in energy performance 32 percent better than an average building. A 4.9-kW grid-tied solar PV array produces electricity; and domestic hot water is provided by a roof-mounted solar collector system. The 15.5 MWh of renewable power generated saves 10 metric tons of GHG emissions annually. Inside, low-VOC carpets, paints, and adhesives provide a healthy work environment. Outside, landscaping with native plants and bioswales reduces runoff.

In addition, the U.S. Fish and Wildlife Service's Morris Wetland Management District Office and Visitor Center, Minnesota, were selected by the Department of the Interior for recognition as part of the FEMP "You Have the Power" campaign. The campaign is a Department of Energy initiative to spread the word about saving energy costs and resources among federal workers. The 8,240 square-foot Office and Visitor Center at Morris Wetland Management District is a model of sustainable design excellence.

2. Performance Evaluations

Interior recognizes the Energy Management Program responsibilities of facility managers, energy managers, designers, and senior leadership through the identification and incorporation of their responsibilities in performance evaluations and position descriptions.

3. Training and Education

In FY 2011, energy management training was provided for 1,181 personnel. Events such as GovEnergy 2011 contributed greatly to educating Interior's energy managers, field personnel, and contracting officers. In addition, Interior energy managers provided information to personnel on available energy management training, and encouraged them to attend as much training as operational requirements and funding permitted. Energy managers involved in building energy efficiency and water conservation have attended training and workshops offered by DOE's Federal Energy Management Program (FEMP) and the First Thursdays mini-seminars. Several personnel have also attended training offered by other organizations such as the Office of the Federal Environmental Executive, the Environmental Protection Agency (EPA), the Association of Energy Engineers, American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), U.S. Green Buildings Council (USGBC), and public utilities; on topics such as green power purchase, the Leadership in Energy and Environmental Design (LEED) rating system, building insulation advances, and water conservation. Interior energy personnel attended on-site training and satellite broadcasts of FEMP courses on meeting ASHRAE sustainable performance and design requirements, metering technologies, power purchase agreements, energy saving performance contracts, and utility energy savings contracts.

Energy managers disseminated relevant information concerning emerging technologies,

alternative means of financing, and energy efficient practices; and developed employee outreach programs to educate building occupants about energy and water management programs.

Interior's Deputy Secretary issued a memorandum during Energy Awareness Month providing actions that every employee can take to help Interior and the Nation conserve energy and reduce greenhouse gas emissions.

Interior's Earth Day and Energy Awareness campaigns promoted the use of ENERGY STAR® and FEMP-designated efficient, low standby power products, as well as energy conservation of existing equipment. Energy Managers participated in Energy STAR® Portfolio Manager training.

In FY 2011, Interior offered quarterly classroom sessions on green procurement with a specific emphasis on Energy Star® and FEMP-designated products. The target audience for these sessions was Interior procurement personnel but was also open to contracting officer representatives and charge card holders. Approximately, 400 personnel attended this training.

4. Use of Energy and Water Efficiency measures in Facilities Covered under EISA Section 432

Section 432 of EISA requires that agencies complete comprehensive energy and water evaluations on its covered facilities which make up 75 percent of its facility energy use. Agencies should evaluate approximately 25 percent of their covered facilities annually so that all facilities are evaluated once every four years. Agency progress towards meeting Section 432 requirements are measured in DOE FEMP's Compliance Tracking System (CTS).

Through FY2011, Interior evaluated 75.7 percent of its total EISA covered facilities gross square feet. Through the completion of annual energy and water evaluations, Interior bureaus have identified \$181,283,597 in Estimated Implementation Cost of Potential ECMs. This cost represents both ECMs that have been implemented as well as ECMs that have not been implemented. It may also include ECMs that have been identified through the evaluation process but do not yield an adequate return on investment. These particular ECMs should be removed from the Compliance Tracking System.

Interior bureaus have just begun entering implemented project data into CTS, thus the number of ECMs completed and associated costs and savings currently represented in CTS is very low compared to the estimated dollar amount of potential ECMs. To date, the Total Project Implementation Costs is \$32,184,114. These projects were implemented through the use of appropriated funding – construction, building rehabilitation, and operations and maintenance funding, as well as ARRA funding, and UESCs. Entering implemented project data into CTS will be an ongoing process throughout FY 2012.

SECTION 2 – Energy Efficiency Performance Summary

A. Energy Intensity Reduction Performance Summary

1. Goal Subject Buildings

EISA established the FY 2011 energy intensity reduction goal of 18 percent relative to the FY 2003 baseline for goal subject buildings.

In FY 2011, Interior's goal subject building energy consumption was **64,493 Btu per gross square foot** without the renewable energy purchase credit. This represents a total reduction in energy consumption per gross square foot of 22 percent relative to the FY 2003 baseline. Interior received credit for purchases of 105 billion Btu of renewable electricity for its goal subject buildings, which lowered the energy intensity of these facilities from 64,493 Btu per gross square foot to 62,993 Btu per gross square foot. This represents a 24 percent reduction relative to the FY 2003 baseline.

2. Excluded Facilities

In accordance with “Guidelines Establishing Criteria for Excluding Buildings from the Energy Performance Requirements of Section 543 of the National Energy Conservation Policy Act, as amended by the Energy Policy Act of 2005”, Interior has categorized energy usage primarily from pumps, aerators, fish feeders, hatchery production, exterior lighting and security at FWS facilities, monitoring stations, and laboratory bio-waste incinerators at USGS facilities, and electricity use at BLM’s Helium Plant and BOR’s Desalination Plant and Brine Injection Plant as “assumed exclusion of structures and processes not qualified as Federal buildings.” These energy processes do not have an associated building gross square footage and will significantly skew building energy usage. In addition, these processes are driven by mission and operational requirements.

3. Non-Fleet Vehicle and Equipment Fuel Use

In FY 2011, Interior used 4.3 million gallons of auto gasoline, diesel, and propane for use in vessels, heavy equipment, standby generators, all terrain vehicles, blowers, mowers, outboard motors, and other small equipment not reported on-line via GSA’s Federal Automotive Statistical Tool (FAST). A total of 246,430 gallons of aviation gasoline and jet fuel were used. Coal was used to power a steam locomotive used as a historic attraction at NPS Steamtown National Historic Park, Pennsylvania.

B. Renewable Energy

1. Renewable Electricity

Interior is dedicated to fulfilling the renewable electricity goals of the EPAAct 2005 and EO 13423 by purchasing and generating electricity from renewable sources. In FY 2011, Interior used 80,010 megawatt hours of renewable electricity from self-generation with on-site bonus and through renewable electricity purchases and credits. This represents 10.1 percent of Interior’s total facility electricity use and exceeds the EPAAct 2005 goal of 5 percent of facility electricity use. Of the 10.1 percent, 4.1 percent represents on-site

renewable energy generation including bonus; 2.2 percent represents renewable electricity purchased through the utility company; and 3.8 percent represents the purchase of renewable energy certificates. The use of on-site renewable energy sources is encouraged if the development of the resource is economically, environmentally, and technically feasible.

2. On-Site Generated Renewable Energy

Interior has implemented approximately 1,600¹ on-site renewable energy projects including stand-alone and grid connected photovoltaic systems, solar thermal (hot water) projects, geothermal (ground source) heat pumps, incremental hydropower, and wind projects. The following new renewable electricity projects were implemented or studied in FY 2011:

BIA **Southwestern Indian Polytechnic Institute (SIPI)**, Albuquerque, New Mexico, installed a 40 kilowatt (KW) photovoltaic system on the Administrative Building using American Recovery and Reinvestment Act (ARRA) funding. This system will offset SIPI's purchased electricity by 72 megawatt-hours (MWh) annually. SIPI also replaced three large steam boilers with five hot water boilers which greatly reduced the natural gas consumption. The project included replacement of 1200 feet of leaking chlorinated polyvinyl chloride piping with steel piping. BIA **Nazlini Community School Fire Station**, Nazlini, Arizona, opened in May. With technical assistance provided by the National Renewable Energy Laboratory, this building is BIA's first net zero energy building. The Nazlini Fire Station will optimize energy efficiency and utilize an on-site 9.9 KW photovoltaic system which will produce at least 75% of its electricity.

BLM **Rawlins Field Office** in Wyoming completed construction of a 100 KW wind turbine as part of BLM's multi-phased energy savings performance contract. This system will generate approximately 240 MWh of electricity annually. BLM's **Fillmore Field Office**, Utah, is a brand new 10,000 square foot LEED Gold building. The owned building includes an 18 KW solar installation, solar water heating, and daylighting that includes tubular skylights throughout.

BOR in partnership with Xcel Energy installed a 9.8 KW photovoltaic system at **Alamosa Field Division**, New Mexico. This system will produce enough electricity to offset approximately 10% of the Field Division's electricity use.

In FY 2011, FWS completed many renewable energy projects. **Stillwater National Wildlife Refuge (NWR)** near Fallon, Nevada, completed the second half of a 2-phase 15 KW photovoltaic system installed at the refuge maintenance shop. The finished system consists of 72 solar panels that avoids an average of 1.7 lbs of CO₂ per KW of power generated. The new **Necedah NWR** Visitor Center, Wisconsin, is a state-of-the-art energy efficient facility featuring a 46 KW photovoltaic array. The PV system was funded through ARRA. The Refuge also features an interactive display on solar-powered energy at the visitor center as part of its environmental education programming. Numerous ARRA-funded renewable energy projects were completed in FY 2011. Some highlights include solar photovoltaic arrays at **Arrowhead NWR**, North Dakota, **Bear River Migratory Bird Refuge**, Utah, **Cibola NWR**, Arizona, **Ottawa River NWR**, Ohio, and many others; ground source heat pumps at multiple locations including **Jordan River National Fish Hatchery**

¹ One project may include multiple renewable energy components at single site, i.e., photovoltaic parking lot lights.

Michigan, and **Audubon NWR**, North Dakota; solar forced air heating at **Agassiz NWR**, Minnesota; solar hot water at **Neosho National Fish Hatchery**, Missouri; and six 5 kilowatt wind turbines at **Izembek NWR**, Alaska. All told, ARRA funds were used for more than 150 renewable energy projects at FWS locations.

Using ARRA funding, NPS has dramatically increased its renewable electricity generating capacity in FY 2011. NPS completed the construction of a 539 KW photovoltaic system at **Yosemite National Park** in California. This system is the largest grid-connected photovoltaic system in the National Park Service and will generate nearly 970 MWh of electricity annually. The solar panels are installed at the **El Portal Maintenance Complex** on the roofs of existing buildings and on newly constructed shade structures under which government vehicles are parked. NPS installed a 50 KW rooftop photovoltaic array at the **Kennesaw Mountain National Battlefield** Visitor Center in Marietta, Georgia. This system will generate approximately 90 MWh of electricity annually. **Alcatraz Island Golden Gate National Recreation Area**, California will complete a multi-phased installation of 285 KW photovoltaic system to replace diesel generated power on the island. Phase 1 (188 KW) was completed in March 2011. Phase 2 (97 KW) is scheduled for completion by the end of calendar year 2011. These systems will generate over 500 MWh of electricity annually. Solar photovoltaic arrays were also installed at **Craters of the Moon National Monument**, Idaho, and **Gateway National Recreation Area**, New York. Meanwhile, a 115 KW incremental hydro power project was constructed at Mammoth Springs in **Yellowstone National Park**. ARRA created a boom of renewable energy projects in national parks, with 42 projects receiving over \$28 million in funding. In FY 2011 the NPS completed the remaining 7 ARRA funded systems which together added over 1,000 KW of new capacity. Together all ARRA projects have increased the NPS's total installed renewable electrical capacity by 170 percent, or 1,740 KW of new capacity. Geothermal heat pumps and one wind system were also installed as part of the ARRA funded projects.

The addition of two net-zero buildings also highlighted NPS's year. The Painted Hills house is a solar-powered employee home at the **John Day Fossil Beds National Monument**, Oregon, and is the first net-zero home in the National Park Service. It was designed and built with the goal to generate as much or more energy than it uses. The house generates energy through photovoltaic solar panel system, solar hot water heater, and produces enough energy to not only cover the residents use but also to charge the occupant's electric vehicle. At **Santa Monica Mountains National Recreation Area**, California, the Intern Center is the first newly-constructed facility in the national park system to meet the NPS "net zero" standard, which is required for all new government buildings beginning in 2020. To eliminate the project's carbon footprint, avoid impacts to climate change, and achieve a high level of energy efficiency, numerous sustainability features were integrated into the \$2.1M design/build project. Site location, building orientation, roof design, a 36 KW photovoltaic system, no incandescent lamps, a geothermal heat pump system, solar hot water heating, extensive daylighting, natural ventilation, window shading, minimal outdoor lighting, and selected landscape features all minimize the use of energy. The PV system for this building is awaiting interconnectivity with the local utility grid.

USGS **Great Lakes Science Center** in Ann Arbor, Michigan recently completed the installation of an innovative 70 ton geothermal heat pump hybrid system with variable frequency drives. The **National Wildlife Health Center** in Madison, Wisconsin completed the construction of a 72 KW photovoltaic system which will generate 107 megawatt-hours of electricity annually. This project was completed using ARRA funding and an energy savings performance contract. The **Patuxent Wildlife Research Center** in Laurel,

Maryland, built a zero-energy residential home with ARRA funding under a joint project with the Fish and Wildlife Service. The 1500 square foot, two-story home was designed to LEED Silver specifications, built in FY 2011 and will be 100 percent complete in FY 2012. The structure has a 4.9 kW PV array on the roof that supplies all the electricity needed for the home. Sustainable building materials were used including above code R-insulating values in this modular home that produced less construction waste with a tighter build. The stormwater is captured and diverted to ground water supplies. All appliances, lighting and electronics are Energy Star models.

3. Purchased Renewable Energy

Interior continues to purchase energy from renewable sources. In FY 2011, Interior bureaus purchased a total of 47,295 MWh of renewable energy from utility providers and through renewable energy certificates.

BIA, BLM, FWS, NPS, and USGS purchased 30,100 megawatt hours of renewable energy certificates. These RECs were generated from woody biomass from Georgia-Pacific Consumer Operations LLC in Zachery, Louisiana.

BOR and USGS purchased 31.3 million Btu of geothermal heat at the **Snake River Area West** office building in Boise, Idaho. The geothermal heat (purchased hot water) is the primary heating source for several buildings on campus.

In FY 2011, five percent of all electricity consumed at the **Interior Complex**, in Washington, DC, was from renewable sources. The National Business Center purchased approximately 902 MWh of renewable electric power in FY 2011 through an area-wide contract established and administered by the General Services Administration. Of this, 25 percent was wind power and 75 percent was from landfill gases.

Seventeen National Park units purchased 16,300 MWh of renewable electricity from their utility providers. Most notably: the **National Mall**, Washington, D.C., **Grand Teton National Park**, Wyoming; **Zion National Park**, Utah; **Rocky Mountain National Park**, Colorado; **Mesa Verde National Park**, Colorado; and **Lincoln Home National Historic Site**, Illinois.

C. Water Conservation

EO 13514 established the FY 2011 water intensity reduction goal of 8 percent relative to the FY 2007 baseline. In FY 2011, Interior reported potable water consumption of 3,952 million gallons at a cost of \$ 20.2 million. This established Interior's FY 2011 water intensity at **56.4 gallons per gross square foot**, which represents an 11 percent reduction relative to the FY 2007 baseline.

Interior remains committed to the efficient use of non-potable water resources and will continue to make improvements in our delivery and use of water wherever feasible. Interior bureaus briefly assessed non-potable water use and found that non-potable water is used for mission related functions. These water uses include: care and feeding of animals and wildlife including endangered species; establishment and propagation of wildlife habitats; power generation and the distribution of water as a result of water rights, contracts, or Tribal agreements; and wildland firefighting. When final CEQ guidance for industrial,

landscaping, and agricultural water use is issued, bureaus will reassess its non-potable water uses.

In FY 2011, NPS began the restoration of the original water cisterns at ***Castillo de San Cristobal and Castillo San Felipe del Morro at San Juan National Historic Site***. Harvested rain water will be directed out of the cisterns to a treatment system that will improve water quality to be used for toilets, showers, hose bibs and water closets. When completed, the cisterns will have a storage capacity of more than 1.2 million gallons and will save NPS \$12,000 annually in water costs.

D. Metering of Electricity Use

The EAct of 2005 requires that all appropriate buildings be metered for electricity by the end of FY 2012. In FY 2011, Interior increased its electricity metering to cover 98% of its 7178 appropriate buildings. Of these 6,618 had standard meters and 414 had advanced meters. By the end of FY 2012, Interior anticipates that 100% of its appropriate buildings will be metered.

E. Federal Building Energy Efficiency Standards

Section 109 of EAct 2005 require that, if life-cycle cost-effective, all new Federal buildings must be designed to achieve energy consumption levels 30 percent below those of the current version of the applicable ASHRAE standard or the International Energy Conservation Code. Since the beginning of FY 2007, 261 of the 264 new building designs have been designed to be 30 percent more energy efficient than the relevant code or has been designed to the highest level of energy efficiency that is life cycle cost effective. Of the new building designs reported since 2007, design documentation for 3 BIA buildings have not been located to confirm that they were designed to the highest level of energy efficiency.

SECTION 3 – Implementation Highlights during FY 2011

HIGHLIGHTS OF FY 2011

A. Life-Cycle Cost Analysis

Interior utilizes life-cycle cost analysis in making decisions about investments in products, services, construction, and other projects to lower costs and to reduce energy and water consumption.

Interior actively manages a portfolio of construction capital investments in order to maximize the return on investment to the taxpayer and Government at an acceptable level of risk. Interior's Asset Management Plan outlines the process whereby Interior is moving from a current reliance on a project-based review process to a life-cycle, asset-based portfolio management process. Effective capital planning within Interior requires improved long range planning and a disciplined budget process as the basis for managing a portfolio of assets to achieve performance goals and objectives with minimal risks, lowest life cycle costs, and greatest overall benefits to the business of the bureaus and the Department.

Interior has developed and continues to refine its approach to establishing a more consistent, structured, performance-based, integrated approach to its Construction Capital Planning Investment Control (CPIC) process. As Interior's portfolio-based approach matures, the Department and the bureaus will continue to improve their ability to manage risks and returns of capital assets throughout their life cycles necessary to ensure that Interior's investments are well conceived, cost-effective, and support strategic mission and business goals. The analysis of these investments is a living tool that will be continually revisited, refined and updated. It is articulated in a business case, the extent of which is commensurate with the cost and impact of the investment on the organization and mission.

B. Retrofits and Capital Improvement Projects

In FY 2011, Interior obligated \$20.4 million in facility energy and water efficiency improvements through direct obligations, and \$4.4 million through utility energy services contracts, which represents a total investment of 20 percent relative to total facility energy costs.

NBC continued its work upgrading the **South Interior Building's** HVAC system. Piping and fan coil units are being replaced to improve the efficiency of the system. NBC has now installed occupancy sensors in all offices of the **Main Interior Building**. High-pressure 150 watt lights in the **Main Interior Building** garage were replaced with LED lights. Energy efficient blast mitigation windows are being installed at the **Main Interior Building** through a UESC with Washington Gas Light.

BIA **Ojo Encino Day School** in New Mexico is currently being constructed using Structural Insulated Panel Systems (SIPS). Formed off-site and trucked to the school, each panel sandwiches framing, insulation and sheathing, leading to a dramatically increased insulation R-factor. The result will be lower heating and cooling costs. BIA completed numerous upgrades during FY 2011. The electrical distribution system was replaced at **Pinon Community School**, Arizona; the exterior insulation was replaced at **Ch'ooshgai (Chuska) Community School**, New Mexico; and heating, lighting, and building improvements were made at **Choctaw Central School**,

Mississippi. HVAC systems were replaced at **Southwestern Indian Polytechnic Institute**, New Mexico, **Haskell Indian Nations University**, Kansas, **Shiprock Agency Headquarters**, New Mexico, **Greyhills High School**, Arizona, **Chi-Ch'il-Tah/Jones Ranch**, New Mexico, **Alamo Navajo School**, New Mexico, **Black Mesa Community School**, Arizona, **Fort Defiance Agency Headquarters**, Arizona, and **Greasewood Springs Community School**, Arizona.

Numerous FWS facilities utilized ARRA funding to complete various energy efficiency projects. **Midway Atoll NWR** installed new HVAC systems, solar water heaters, and other energy efficiency projects such as lighting replacement, insulation, weatherization, window replacement, and door replacement. **Warm Springs National Fish Hatchery**, Oregon, installed a solar PV system, replaced heat pumps, HVACs, and hot water heaters, and performed electrical code upgrades. The **National Conservation Training Center**, West Virginia, installed occupancy sensors, Energy Star kitchen appliances, a solar hot water system, water efficient toilets, energy efficient hand dryers, and upgraded HVAC, cooling, and other energy systems. ARRA funded energy efficiency upgrades at **Dexter National Fish Hatchery and Technology Center**, New Mexico, **Mora National Fish Hatchery and Technology Center**, New Mexico, **Connecticut River Coordinator Office**, Massachusetts, **Benton Lake NWR**, Montana, **Sand Lake NWR**, South Dakota, **Kenai NWR**, Alaska, and **Don Edwards San Francisco Bay NWR**, California.

In FY 2011, NPS completed the following energy efficiency upgrades: **Everglades National Park**, Florida, completed building envelope modifications, improvements to lighting and HVAC systems, water and sewer conservation upgrades, and other energy efficiency projects. **Mammoth Cave National Park**, Kentucky, and **Martin Luther King Jr National Historic Site**, Georgia, upgraded cold and hot water and steam distributions systems, and made improvements to lighting and HVAC systems, water and sewer conservation upgrades, and other energy efficiency projects. **Hot Springs National Park**, Arkansas, installed a new HVAC unit for the Safety Office. **Lincoln Home National Historic Site**, Illinois, installed storm windows at the Dubois house. Energy efficiency upgrades were also made at **Lowell National Historic Park**, Massachusetts, **Shenandoah National Park**, Virginia, and **Valley Forge National Historical Park**, Pennsylvania.

In FY 2011, the USGS **Idaho Water Science Center**, Idaho, renovated Building 3 with \$1.3 million of direct agency and ARRA funds to transform the building from a warehouse to a modern office building. Improvements included use of utility supplied geothermal heat to service a new heating, ventilating and air-conditioning (HVAC) system with a new Energy Star boiler and hot water heater. Additional upgrades were completed on the plumbing, lighting, and building envelop with energy efficient windows, roofing, and new siding. The **Columbia Environmental Research Center (CERC)** in Columbia, Missouri, has two major constructions projects underway that will reduce energy and water consumption on the campus. The first is a laboratory consolidation project that will eliminate nine smaller buildings and construct one new, more efficient laboratory building. The second project is the replacement of the fume hood exhaust system in the main laboratory building with a more efficient system. The **S.O. Conte Fish Laboratory** in Turner Falls, Massachusetts, installed new cool roofing, a solar roof, and replaced rooftop HVAC equipment with high efficiency models. Nearly \$1.7M of ARRA and USGS direct funding was used to install new roofs on three buildings and construct one new building (with a solar roof) on the campus. The roofs were cool roof construction with Energy Star roofing membranes, and one roof included passive solar daylighting in the design. A new 30-ton rooftop compressor condenser unit was installed in addition to variable frequency drives on pumps and time clocks on heaters to reduce operating hours and save energy. The **Earth Resource Observation System** in Sioux Falls, South Dakota, is one of the largest USGS campuses both in size and energy consumption. In FY 2011, several energy and water efficiency projects were initiated, continued or completed including: replacement of indoor cooling towers; replacement of large skylight; upgrade of a 200 and 300-ton chiller; redesign and replacement of HVAC system; recoat of the interior and exterior of water tower; replacement of roof; upgrade of boilers with staged units, and the replacement of exterior windows.

C. Use of Performance Contracts

1. Energy-Savings Performance Contracts (ESPCs)

In FY 2011, USGS **National Wildlife Health Center** (NWHC), Wisconsin, continued project work under an ESPC. The NWHC used ARRA funding to support very specific energy conservation measures (ECMs). The seven specific ECMs that were funded by ARRA are: two lighting projects, two exhaust fan replacement projects, replacement of three furnaces and one boiler, replacement of four air handlers, and replacement of building control systems. The value of the ECMs is estimated to be approximately \$6.7 million. The non-ARRA projects include boiler plant improvements in the TIB, chiller plant improvements in the Main Building, a 72.2-kW solar photovoltaic system, and a waste sterilization heat recovery system to improve energy efficiency.

NPS **Isle Royale National Park**, Michigan, is in the process of developing an ESPC with the assistance of the Department of Energy.

2. Utility Energy Services Contracts (UESCs).

In FY 2009, Washington Gas Light conducted an extensive energy audit at the **Main Interior Building**, Washington, DC. In FY 2010, Washington Gas Light conducted extensive studies on various blast resistant windows that also provided thermal insulation. NBC, in collaboration with the General Services Administration, selected the best product which satisfied historical, security and energy efficiency requirements. The UESC was awarded in FY 2011. Installation has not yet begun.

The FWS executed a UESC with PEPCO Energy Services for approximately \$953,000 to complete the renovation of the heating ventilation, and air conditioning system at the **National Wildlife Visitor Center** in Laurel, Maryland. The project includes the replacement of HVAC air handler, return fan and condensing unit, cleaning and maintenance of seven reheat coils, partial conversion to VAV boxes for the gift shop and restrooms, replacement of roof exhaust fans, modernization of digital controls, and installation of variable speed drives for fan motors. The contract work is anticipated to be completed in FY 2012.

3. Other Types of Contracts.

N/A

D. Use of ENERGY STAR® and Other Energy-Efficient Products

Interior selects, when commercially available, ENERGY STAR®, FEMP Designated, and other energy-efficient products when acquiring energy-consuming products. Energy efficient technologies include high-efficiency lighting and ballasts, exit signs, energy efficient motors, and the use of packaged heating and cooling equipment with energy efficiency ratios that meet or exceed Federal criteria for retrofitting existing buildings.

E. Sustainable Building Design and High-Performance Buildings

Interior is striving to be a government leader by implementing sustainability policies that meet or exceed EO 13423 and 13514 requirements and integrate the five Guiding Principles into the design, construction, operations, and maintenance of Interior-owned and leased buildings. Sustainable building design principles have been incorporated into the siting, design, and construction of Interior projects. Energy managers work closely with their engineers, architects, and design offices to address energy conservation retrofits and new building designs, and ensure that buildings comply with Federal energy laws and regulations. All cost effective, energy conservation opportunities are analyzed for consistency with resource management objectives. Energy conservation efficiency standards are included as an integral part of all engineering design and construction project technical specifications.

Interior has 39 LEED certified buildings:

- BIA ***Baca Dlo'ay Azhi Community School***, Prewitt, Arizona – LEED Certified
- BIA ***Cherokee Central School Complex***, North Carolina – LEED Silver
- BIA ***Chinle Boarding School: Kitchen***, Many Farms, Arizona – LEED Gold
- BIA ***First Mesa Elementary School***, Polacca, Arizona – LEED Certified
- BIA ***Jeehdeez'a Academy***, Arizona – LEED Certified
- BIA ***Meskwaki Settlement School***, Iowa – LEED Silver
- BIA ***Muckleshoot Tribal School***, Auburn, Washington – LEED Silver
- BIA ***Navajo Preparatory School***, New Mexico – LEED Silver
- BIA ***Porcupine Day School***, South Dakota – LEED Silver
- BIA ***Pueblo Pintado Community School***, New Mexico, -- LEED Gold
- BIA ***Rough Rock Community School***, Arizona – LEED Silver
- BIA ***St. Francis Indian Middle and High School***, St. Francis, South Dakota – LEED Certified
- BIA ***Standing Rock Elementary School***, North Dakota – LEED Gold
- BIA ***Turtle Mountain High School***, Belcourt, North Dakota – LEED Silver
- BLM ***Escalante Science Center***, Escalante, Utah – LEED Gold
- BLM ***Fillmore Field Office***, Fillmore, Utah
- BLM ***Gateway III Office Tower*** (leased), Salt Lake City, Utah – LEED Certified
- BLM ***New Mexico State Office***, Santa Fe, New Mexico – LEED Gold (leased facility)
- BLM ***Rawlins Field Office***, Rawlins, Wyoming – LEED Gold
- BLM ***Red Rock Canyon Visitor Center***, Nevada – LEED Gold
- BLM ***Safford Field Office***, Arizona – LEED Silver
- FWS ***Neosho Hatchery Visitor Center***, Missouri – LEED Gold
- FWS ***Nulhegan Basin Administration Building and Visitor Contact Facility***, Silvio O. Conte NFWR, Brunswick, Vermont – LEED Silver

- NPS with the GSA **Carl T. Curtis Midwest Regional Headquarters**, Omaha, Nebraska – LEED Gold
- NPS **Blue Ridge Parkway Destination Center**, Asheville, North Carolina – LEED Gold
- NPS **Denver Service Center Office Building** (Leased) – LEED Gold
- NPS **Entrance Area Visitor Center**, Denali National Park, Alaska – LEED Silver
- NPS with Xanterra Parks and Resorts **Annie Creek Gift Shop**, Crater Lake National Park, Oregon – LEED Silver
- NPS **South Rim Maintenance and Warehouse Facility**, Grand Canyon National Park, Arizona – LEED Certified
- NPS with Xanterra Parks and Resorts **Employee Housing**, Yellowstone National Park, Montana – LEED Certified
- NPS **Apgar Transit Center**, West Glacier, Montana – LEED Gold
- NPS **Eielson Visitor Center**, Denali National Park, Alaska – LEED Platinum
- NPS **Gettysburg National Military Park** Visitor Center, Pennsylvania – LEED Gold
- NPS **Golden Gate Recreation Area** Cavallo Point, Sausalito, California – LEED Gold
- NPS **Hawaii Volcanoes National Park** Visitor Emergency Operations Center – LEED Platinum
- NPS **Mill Complex, Forest Center and Wood Barn**, Woodstock, Vermont – LEED Platinum
- NPS **Lassen Volcanic National Park**, Redding, California - LEED Platinum
- NPS **Old Faithful Visitor Education Center**, Yellowstone National Park, Wyoming – LEED Gold
- NPS **Twin Creeks Science and Education Center**, Tennessee, LEED Gold

Recent projects that are LEED registered or under development include:

FWS **Administrative Headquarters Building and Visitor Center**, Desert National Wildlife Refuge, Nevada, is currently under design with anticipated construction completion in FY 2011. Other projects include **Big Stone NWR**, Minnesota; **Tamarac NWR**, Minnesota; **Anahuac NWR**, Texas; **Iroquois NWR**, New York; **Kealia Pond NWR**, Hawaii; **Long Island NWR Complex**, New York; **Red River NWR Headquarters and Visitor Center**, Louisiana; **Paris Office/Visitors Center**, Tennessee; **Commerce City Visitor and Education Center**, Colorado.

BIA projects for which LEED certification is a goal include **Ojo Encino Day School**, New Mexico; **Crown Point School**, New Mexico; **Kaibeto Boarding School**, Arizona; **Dilcon Community School**, Arizona; **Circle of Life School**, Minnesota; **Crow Creek Tribal School**, South Dakota; **St. Francis Indian School Gymnasium Addition**, South Dakota; **Loneman Replacement School**, South Dakota; **Pine Ridge Dormitory**, South Dakota.

BLM projects for which LEED certification is a goal include the **Kanab Field Office**, Utah; **Red Rock Canyon Desert Learning Center**, Nevada; **Mojave Discovery Center**, Nevada; the **Farmington Field Office**, New Mexico; **Ely Seed Warehouse**, Nevada; **Boise District Radio Shop Building**, Idaho; **Desert Discovery Center**, California; **Plymouth Mountain Hot Shots Facility**, Nevada.

NPS projects currently under design, construction or have been registered for certification include the **Beaver Meadows Visitor Center**, Colorado; **Mesa Verde Research and Museum Collection Center**, Colorado; the **Marina Service Building**, Cottonwood Cove, Nevada; **Canyon Village Master Site**, Wyoming; **Quarry Lower Visitor Center**, Dinosaur National Monument, Colorado, the **Jeff Smiths Parlor Museum Building** and the **Meyer Building**, Alaska, **Furnace Creek Visitors Center**, Death Valley National Park, California, **Point Reyes Hostel**, California, **West Side Visitor Center**, Pinnacles National Monument, California.

USGS projects currently under design, construction or have been registered for certification include the **CERC New Research Building**, Columbia, Missouri.

F. Energy Efficiency/Sustainable Design in Lease Provisions

All new building lease solicitations include a preference for buildings that meet the goals of the Guiding Principles, where applicable, in the selection criteria for acquiring leased buildings. Build-to-suit lease solicitations incorporate criteria for sustainable design and development, energy efficiency, and verification of building performance in accordance with the Guiding Principles.

G. Distributed Generation, Including Use Of On-Site Renewable Energy Resources and Combined Cooling, Heating, and Power Systems

Interior continues to pursue projects that self-generate energy using renewable sources (such as photovoltaics or wind turbines) or renewable energy thermal projects (such as solar thermal, biomass, or geothermal) where life cycle cost effective.

The following are examples of distributed generation and off-grid generation that were implemented in FY2011:

BIA grid independent renewable energy systems include: Solar water heating at ***Rough Rock Community School***, Arizona, and ground source heat pumps at ***Cherokee High School***, North Carolina, and ***Pueblo Pintado School***, New Mexico.

FWS installed vertical axis wind turbines at the ***Alaska Peninsula NWR***; solar photovoltaic panels at ***Anahuac NWR***, Texas, ***Aransas NWR***, Texas, ***Ash Meadows NWR***, Nevada, and ***Hawaiian Islands NWR***, ground source heat pumps at ***Long Island NWR***, New York, ***Upper Mississippi River NFWR***, Minnesota, and ***Warm Springs National Fish Hatchery***, Oregon, and solar water heating at ***Togiak NWR***, Alaska, and ***Turnbull NWR***, Washington, among many other projects.

NPS installed solar photovoltaic arrays at ***Cumberland Island National Seashore***, Georgia; ***Fort McHenry National Monument and Historic Shrine***, Maryland; ***Gulf Islands National Seashore***, Mississippi; ***Hopewell Furnace National Historic Site***, Pennsylvania; and ***Indiana Dunes National Lakeshore***, Indiana.