Interior Energy Management News

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At Interior It's out with the Old, in with the New

A New Fiscal Year Brings New Opportunities and Challenges

In the world of Federal energy management, fall is a busy time of year. Fall signifies the end of the fiscal year and the beginning of reporting season, as we look over our performance from the preceding year. Fall is also a time to celebrate progress made and to challenge ourselves to continue to excel in the new fiscal year.

October was Energy Action Month across the Federal government. This issue of the Newsletter includes tips for saving energy at the office and at home. December, meanwhile, saw a ceremony celebrating the winners of the FY 2014 Federal Energy and Water Management Awards. See page 6 for details of DOI's winners, and pages 1 – 3 for a longer article on the Bureau of Reclamation's award winning drought forecasting program.

DOI celebrated a milestone of its own with the issuance of a brand new Departmental Manual chapter of energy management (752 DM 1)—the first update in nearly twenty years. See pages 3 – 4 for an article describing developments in Federal energy policy in the intervening years.

This issue also includes updates on energy, water, and sustainability projects from throughout the bureaus, as well as announcements from the DOI Energy Management Program.

Inside this Issue:

BOR Award-Winning Drought Forecasting Program

DOI Energy Management DM Updated

Energy Action Month

FY 2014 FEMP Award Winners

Bureau Notes

Announcements

Award Winning Bureau of Reclamation Program Provides Drought Relief

Visualizing Water Savings at Mountain Park Project Earns Federal Recognition

The Bureau of Reclamation's Oklahoma-Texas Area Office (OTAO) received a Program Award in the FY 2014 Federal Energy and Water Management Awards competition for the Visualizing Water Savings at Mountain Park Project, which includes a drought forecast model. The awards, sponsored by the Department of Energy's Federal Energy Management Program (FEMP), recognize innovative energy- and water-saving projects, programs, and individuals across the Federal Government. In this case, the Bureau of Reclamation's (BOR) program directly addresses a critical need for the residents and the economy of southwest Oklahoma.

BOR's Tom Steed Reservoir, otherwise known as the Mountain Park Project, serves as the primary water supply for the cities of Altus, Snyder, and Frederick, and for the expanding Altus Air Force Base. This region has experienced extreme drought conditions for several years, preventing the irrigation of cotton crops and causing an estimated $250 million annual impact on the local economy. The National Integrated Drought Information System has categorized this region as being in D4 Exceptional Drought with the drought projected to persist or worsen in 2014. With depleted inflows, the reservoir level continues to decline to new record low elevations with reservoir storage currently below 30% of its capacity.

In light of growing concerns about reservoir depletion during ongoing extreme drought conditions, OTAO management identified this opportunity to provide drought assistance to its operating partner, the Mountain Park Master Conservancy District (District). Working with the District, a team from the OTAO utilized a reservoir firm yield model to estimate future water availability under continuing drought conditions.[1] The team modified a previously created yield model, which relied on approximately a century of historical data. The new drought forecast model incorporates operational data from the last 24 months of exceptional drought to project current drought conditions into the future. The tool simulates the lake volume and elevation based on historical inflow to and predicted losses and releases from the reservoir. The tool allows BOR to evaluate how the reservoir will react under varying usage conditions and conservation triggers if drought conditions persist. These efforts align with BOR's mission by protecting this drinking water resource for southwest Oklahoma.

Use of the model resulted in an increased understanding of the severity of the ongoing drought and led to implementation of significant water conservation measures. Once the model had been prepared and the reservoir outlook was understood, OTAO presented this information to the District Manager and Board of Directors to create urgency in implementing water conservation strategies. The District then met with each of their member cities to ask for voluntary efforts to reduce water usage. Based on this message, the local city councils asked for briefings from BOR which could be disseminated to the public to increase awareness regarding the need for water conservation. The District then set a target for water conservation for each city.

All three cities have created water conservation plans with graduated conservation requirements depending on the severity of the drought and have implemented mandatory water conservation measures. A few examples of conservation measures that have been implemented include limiting days when car washes may be open and limiting outside watering to one day a week.

Drought Conditions, Oklahoma. Credit: BOR.

[1] The firm yield of a reservoir is the maximum yield that can be delivered from a system without failure, even during a severe drought.

The City of Altus public pool has completed a groundwater well to eliminate usage of reservoir water altogether.

These water conservation efforts have allowed the District to realize a 37% reduction in water deliveries from Tom Steed Reservoir compared to 2012; approximately 3,500 acre-feet (1.14 billion gallons) of water was conserved in 2013. There were also ancillary benefits including approximately $40,000 (nearly 600,000 kilowatt-hours (kWh)) of energy savings resulting from reduced pumping requirements, which equates to over 450 metric tons of carbon dioxide equivalent emissions (MTCO2e) avoided, roughly the average annual emissions of 95 automobiles or 41 homes. Additionally, these efforts realized approximately $10,000 in operation and maintenance savings and avoided water treatment costs. Lastly, the efforts improved recreation and fish and wildlife conditions due to higher reservoir levels than would otherwise have occurred.

The Visualizing Water Savings program has had a wider effect on the region as well. The OTAO has applied this same drought modeling effort to other drought stricken reservoirs in Oklahoma including Foss and Fort Cobb Reservoirs (Washita Basin Project) and Lake Thunderbird (Norman Project). Meanwhile, the Mountain Park Master Conservancy District is now working with their cities to implement water conservation-based rate plans which reward users for reduced consumption, while still collecting revenues necessary to operate and maintain the project. Historically, water rates for consumers in Oklahoma have been based on take or pay contracts with higher use rewarded by lower rates.

The Department congratulates the award winning OTAO team of Matthew Warren, James Allard, Nicholas Garmon, and Darion Mayhorn for their outstanding efforts to protect and conserve the water resources of southwestern Oklahoma.

The Award-Winning Team. Left to Right: James Allard, Darion Mayhorn, Matt Warren, Nicholas Garmon. Credit: BOR.

New Energy Management Policy Issued

Updated Departmental Manual Reflects Recent Developments in Federal Energy Policy

The Department's new Departmental Manual (DM) on Energy Management, 752 DM 1, was approved on July 24, 2014 and is now available on ELIPS at http://elips.doi.gov/ELIPS/DocView.aspx?id=4035. This updated policy reflects changes to facility energy and water management, conservation, and reporting as required by various statutes and Executive Orders (EO). Since the Energy Management DM was last updated in 1995, Federal requirements in energy efficiency, water conservation, renewable energy, and sustainable practices have undergone numerous changes. A few of the most significant developments in Federal energy policy are detailed below.

In 2005, Congress passed the Energy Policy Act (EPAct), which for the first time set a target for renewable energy as a portion of facility electricity consumed by a Federal agency. It also mandated the

installation of electric meters in appropriate Federal buildings by FY 2012, set energy efficiency standards for new building designs, and mandated the procurement of Energy Star® or FEMP-designated products, among other requirements.

Two years later, the Energy Independence and Security Act of 2007 (EISA) strengthened many of EPAct's provisions and added new requirements. Most notably, EISA requires agencies to achieve a 30% reduction in facility energy intensity (Btu/square foot) by FY 2015 relative to a FY 2003 baseline, install steam and natural gas meters at appropriate buildings by FY 2016, reduce the fossil fuel-generated energy consumption of new building designs, and conduct energy and water evaluations in 25% of covered facilities annually. EISA also permanently reauthorized the use of Energy Savings Performance Contracts (ESPC) by Federal agencies, and includes additional provisions on energy efficient products, solar hot water heaters, large capital energy investments, and space leasing.

Several key Executive Orders have greatly affected the energy management responsibilities of agencies. EO 13423 (January 2007) set a target for facility electricity consumption of new (after January 1, 1999) renewable energy, and required agencies to make a 2% annual reduction in water intensity against a FY 2007 baseline; install meters for water, electricity, and thermal energy; comply with the Guiding Principles for High Performance and Sustainable Design (Guiding Principles) in new buildings and major renovations and 15% of existing buildings; and reduce greenhouse gases (GHG) by reducing energy intensity.

Many of the requirements that are familiar to the Federal energy and sustainability community stem from EO 13514, signed in 2009. EO 13514 builds upon EO 13423's focus on GHG emissions by requiring agencies to set targets for Scope 1&2 (direct) and Scope 3 (indirect) GHG emissions reductions against a FY 2008 baseline by FY 2020. EO 13514 also extends the water intensity reduction target to 26% below the FY 2007 baseline by FY 2020 (and included several other new water use requirements), reiterates and expands requirements for compliance with the Guiding Principles, tasks agencies with achieving net zero energy use by 2030 in buildings designed in 2020 and beyond, and strengthens procurement requirements such that 95% of new contract actions for products and services meet a set of energy and environmental criteria.

Recently, the December 2013 Presidential Memorandum on Energy Management increased the target for Federal agencies to obtain 20% of their facility electricity from renewable sources by FY 2020, and requires that purchased renewable energy be generated by sources that went into operation within ten years of the current fiscal year. The Memorandum also requires individually metered buildings greater than 5,000 square feet that are part of EISA Covered Facilities to be benchmarked in Energy Star® Portfolio Manager.

There have been a few observable trends in Federal energy management in the time since the DM was last updated. There is now even greater attention given to the overlap of energy management and environmental stewardship. With growing concerns about climate change, much of the focus from the White House is now on reducing GHG emissions and growing the renewable energy market. Budget pressures have also led to an emphasis on performance contracting mechanisms such as ESPCs and Utility Energy Services Contracts. Of course, the bottom line remains a major driving force behind energy and water conservation. Saving dollars matters as much or more now than ever. The new DM reflects the Department's ongoing commitment to leadership in Federal in energy and water conservation, sustainable building design, renewable energy generation and use, and all aspects of sustainability. Any questions about the DM may be directed to Mary Heying, the Department's Energy Program Manager (Mary_Heying@ios.doi.gov).

Energy Action Month

Every October is Energy Action Month across the Federal Government. This year's theme is "Transition to a Clean Energy Reality," which echoes the White House's push for a clean energy economy that will create new jobs and develop environmentally friendly sources of energy.

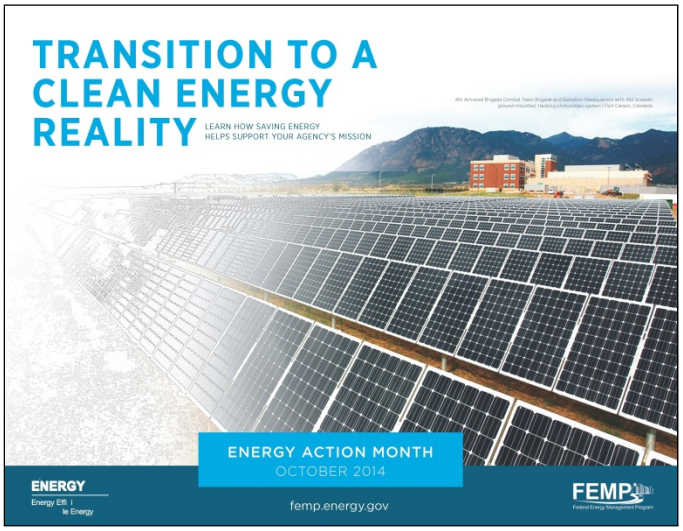
The Department of the Interior is leading the way in the transition to clean energy. We have already issued permits for more than 10 gigawatts of renewable energy on public lands and we will double that total by 2020, providing clean, carbon-free energy for 6 million homes. These actions help secure our nation's energy future, strengthen the economy, and create good jobs, while maintaining responsible stewardship of the land. But we must not forget that our individual actions matter, too. Ensuring a sustainable planet for future generations requires us to conserve the resources we rely on daily on the job and in our homes.

While Energy Action Month comes only once a year, we can be leaders in conservation every day. From turning off our desk lamps, to buying environmentally friendly products, to retrofitting buildings, we can all make a difference no matter what our roles might be. Across the government, federal employees just like you are leading our country forward toward a cleaner, more energy secure future. Some of these innovators were recognized with awards by the Department of Energy's Federal Energy Management Program. Visit http://www.doi.gov/pam/programs/energy_management/awards.cfm to read about Interior's achievements and learn how to bring these lessons to your workplace.

Here are a few lessons to apply this fiscal year and beyond:

- Lights out! Turn off your lights and other equipment when leaving an office unoccupied;
- Use compact fluorescent lights (CFLs) and light emitting diodes (LEDs), and take advantage of natural lighting;
- Use carpooling, vanpooling, public transportation, and transit subsidy programs;
- Opt for telework, conference calls, and videoconferencing when possible;
- Purchase ENERGY STAR® and FEMP-designated equipment;
- Recycle and reuse materials;
- Install programmable thermostats and replace air filters every three months at a minimum;
- Suggest energy saving improvements to your manager;
- Finally, create a green "buddy system" with an officemate to help each other remember to act on these energy saving tips. Together, you will develop a green routine.

We can save energy (and save money) at home as well. Last summer, the Department issued a brand new employee greening guide (http://www.doi.gov/greening/employee-greening.cfm) that all employees can voluntarily use to find ideas for reducing their carbon footprint both at work and at home. Together, our individual actions can bring about real change.



Federal Energy and Water Management Award Winners

Bureaus Receive Recognition in FY 2014

The Department won three Federal Energy and Water Management Awards in FY 2014. The awards, sponsored by the Department of Energy's Federal Energy Management Program (FEMP), recognize innovative energy- and water-saving projects, programs, and individuals across the Federal Government. The Department has a strong track record of success in this competition and this year's winners continue that tradition of excellence. The three awards exemplify the commitment to sustainability and conservation that is central to the mission of DOI's bureaus. These winning projects help strengthen the nation's energy security and reliability and increase its use of renewable energy sources. They likewise protect the environment by avoiding greenhouse gas emissions, using water efficiently, and containing environmentally-friendly materials. The winning projects also showcase sustainable features and practices to visitors that come to see the natural beauty of America's great outdoors.

FEMP honored the award winners during a December 9th ceremony at the National Archives in Washington, DC.

The Department's three award recipients are as follows:

U.S. Bureau of Reclamation – Oklahoma-Texas Area Office Visualizing Water Savings at Mountain Park Project (Program Award). See pages 1 – 3 for more information.

U.S. Fish and Wildlife Service – The Headquarters and Visitor Center at the Upper Mississippi River National Wildlife and Fish Refuge - La Crosse District, Wisconsin received a Project Award. The Leadership in Energy and Environmental Design (LEED) Silver-certified Center exemplifies the sustainability goals of Executive Order 13514. The Center, which was built using environmentally friendly, regionally extracted and manufactured materials, uses multiple cost-effective, innovative strategies to reduce energy and water consumption. Outdoors, water-efficient landscaping with native plant species avoids chemical use and eliminates irrigation, while storm water containment and drainage swales boost water conservation. Renewable energy systems, including a geothermal heat pump, solar hot water system, and photovoltaic (PV) array, contribute to the building's ultra-low carbon footprint. All told, the project avoids 85.5 MTCO2e greenhouse gas emissions per year, equivalent to the annual emissions of 18 passenger vehicles.

Headquarters and Visitor Center at Upper Mississippi River National Wildlife and Fish Refuge - La Crosse District. Credit: FWS

U.S. Geological Survey – The Great Lakes Science Center (GLSC) in Ann Arbor, Michigan received a Project Award for a wet laboratory upgrade. The project upgraded the lab's distribution and discharge systems, changed the water supply from well water to city water, installed new PVC piping to reduce the risk of clogging, and drastically lowered the need for pumping energy. The system now operates as a re-circulating water system rather than a once through operation, conserving roughly 52.6 million gallons per year that were previously drawn from the local aquifer. Water is no longer discharged to the storm water system, eliminating the need for a $9,000 annual discharge permit. The use of a re-circulating system also reduced the operation of the facility's chillers, saving 350,000

kWh of electricity per year and preventing the emission of 241 MTCO2e, the annual emissions of 51 passenger vehicles. In FY 2013, the GLSC electricity consumption was 32% less than FY 2011 when the wet lab was last in full operation.

Wet Lab Water Flow, USGS Great Lakes Science Center. Credit: USGS

Bureau Notes

Sustainability Updates from around the Bureaus

Bureau of Indian Affairs:

In FY 2014, the BIA installed ground source heat pumps at ***Riverside Indian High School***, Oklahoma. BIA also completed the ***Havasupai Supplemental Environmental Project Solar PV Electrical System*** at the Grand Canyon in Arizona, which is currently undergoing additional testing and troubleshooting. It is expected to be fully operational in FY 2015.

Bureau of Land Management:

The BLM established a Think Green! Award to promote employee awareness of Department Sustainability goals including those that set targets for energy efficiency and use reductions. The first award was presented to an employee who championed the use of smart power strips as an energy efficient device to turn off computer screens and work station lighting when not in use. This winning idea and similar ideas (honorable mentions) were recognized by the BLM Director in the BLM's Earth Day celebration. The BLM recently completed a full length training film funded by the Department of Energy that details the sustainable buildings inspection process pioneered by the BLM. The Sustainable Training Film will be distributed government-wide to help every agency in their quest to retrofit their facilities to meet the federal guidelines for water and energy efficiency. Lastly, BLM installed a 1.5 kilowatt (kW) wind turbine a 300 Watt solar PV system on a former radio tower at ***Horning Seed Orchard***, Oregon.

Bureau of Reclamation:

In FY 2014, the BOR achieved LEED certification at two buildings. The ***Grand Coulee Materials Storage Building***, Washington, (LEED Silver) is a 50,000 square foot building constructed for the maintenance and replacement of turbines in the third power house at Grand Coulee Dam. The ***Animas La Plata Operating Facility***, Durango, Colorado, was constructed as part of a larger project related to Indian water rights settlement. It achieved LEED Gold and has one of the first passive solar heating systems in the Department. The BOR ***Provo Area Office***, Utah, installed a 25 kW PV electrical generating system capable of providing up to 25 percent of the electricity requirements for the building.

Animas La Plata Operating Facility, Colorado. Credit: BOR.

U.S. Fish and Wildlife Service:

The FWS completed an energy retrofit of the Headquarters Building, ***Tamarac NWR***, Minnesota, which includes a 31.5 ton ground source heat pump system, a 13.92 kW solar PV power system, and a 24

square-foot solar hot water heating system. The net-zero ***Corn Creek Administrative Headquarters and Visitor Center, Desert NWR, Nevada***, achieved LEED Platinum status on May 16, 2014. This sustainable project includes a total of 121 kW of solar PV, which is comprised of an 86 kW solar PV power system for the building and the balance of approximately 35 kW solar PV power for water pumping. Finally, the FWS worked with FEMP to develop an online operations and maintenance training for solar PV technology, which was made available electronically for on-demand trainings through the FEMP website, the Whole Building Design Guide, and the U.S. Green Building Council. The film utilized the net-metered, ground-mounted 43 kW system at the ***National Conservation Training Center***, West Virginia, as the case study.

Solar PV System at the FWS National Conservation Training Center, West Virginia. Credit: FWS.

National Park Service:

The ***President's Park White House Visitor's Center***, Washington, DC, underwent a renovation that resulted in a 32.5 percent reduction in water use through the use of water conserving fixtures and a lighting energy reduction of 58 percent through daylight controls for the majority of lighting fixtures. The NPS concessionaire Forever Resorts opened the Marina Services Building at the Cottonwood Cove area of ***Lake Mead National Recreation Area*** (Arizona and Nevada). It is the first floating building to achieve LEED certification (Gold) from the U.S. Green Building Council (USGBC). It was built on the site of a previously developed marina, which prevented any undeveloped shoreline from being disturbed, and employs numerous innovative technologies to reduce energy and water consumption and environmental impact. Finally, the NPS ***National Capital Region*** awarded Phase 1 of its ESPC project. The region-wide project includes 13 park units. The project implementation cost is $28 million and has an estimated annual savings of $1 million per year from energy and water efficiencies. The NCR anticipates developing and awarding phase 2 of this project in FY 2015.

Marina Services Building, Lake Mead National Recreation Area. Credit: NPS.

U.S. Geological Survey:

USGS awarded a $12 million task order under the Department of Energy (DOE) ESPC to Siemens on July 29, 2014. The 21-year term contract has an estimated annual energy savings of $650,000 or 15% of USGS total annual energy use. Water savings are estimated at $18,000 per year, a 5% decrease in potable water use. The task order covers projects for the ***National Center*** in Reston, Virginia; the ***Columbia Environmental Research Center*** in Columbia, Missouri; and the ***Western Fisheries Research Center*** in Seattle, Washington. Construction of energy conservation measures will begin in early FY 2015 and continue through the fiscal year.

Announcements

(1) Greenhouse Gas and Sustainability Data Report: The Department submitted the Annual GHG and Sustainability Data Report to DOE FEMP on January 30, 2015. This data report serves as the Department's collection tool for GHG and energy management data. Results of the FY 2014 report will be discussed in the Spring 2015 newsletter issue.

(2) Energy Savings Performance Contracts: The Presidential Memorandum of December 2, 2011, required agencies to commit to an Energy Savings Performance Contract award amount to reduce energy consumption throughout the Federal Government. Energy savings performance contracts allow Federal agencies and an energy service company to complete energy and water conservation measures with no upfront cost. The facility energy improvements are paid for by utility cost savings generated from the improvements. The Department committed to award $20 million in energy savings performance contracts by December 2016. To date, the bureaus have awarded 4 energy savings performance contracts: NPS Isle Royale Phases 1 and 2, USGS Multi-Site project, and NPS National Capital Region project. These projects have a total project value over $45 million, exceeding DOI's commitment level.

(3) Training: FEMP continues to expand their selection of training courses. Many of these courses are available on demand at http://apps1.eere.energy.gov/femp/training/. Many of these courses also will assist Federal energy and facilities personnel in meeting the core competencies of the Federal Buildings Personnel Training Act.

For More Information Please Contact:

Mary Heying
Energy Program Manager
Mary_Heying@ios.doi.gov
(202) 513-0722

Dan Collinge
Energy Program Analyst
Daniel_Collinge@ios.doi.gov
(202) 513-0724