Case study

U.S. Bureau of Land Management

Denver, Colorado

Streamlined approach to small, distant buildings provides energy cost savings and meets executive orders

As manager of more public land than any other federal agency, the Bureau of Land Management (BLM) has thousands of facilities used by a wide variety of occupants. You'll find field workers in district or field office buildings, firefighters in remote fire stations, campers in visitor centers and campgrounds – and even ranchers in BLM facilities for managing wild horses. The buildings often are small, spread out and frequently remotely located miles away from traditional power sources.

BLM and Johnson Controls have developed an award-winning approach to reducing energy in these diverse building types by upgrading more than 100 sites in 10 states. Using a variety of funding sources – such as Energy Savings Performance Contracts (ESPC), American Recovery and Renewal Act (ARRA), and utility rebates – BLM and Johnson Controls have developed a $24 million program to save energy while improving infrastructure, enhancing energy security and reducing greenhouse gas emissions.

The results: Reducing energy annual costs by over $1.2M while also expediting much needed facility improvements.

Federal energy efficiency escalates

Awareness of federal Executive Orders that require increased energy and water efficiency, reduced greenhouse gas emissions and sustainable federal facility operations means that agencies are anxious to develop comprehensive plans for

Johnson Controls

The Anasazi Heritage Center in Colorado includes 38 kilowatts of photovoltaics on the energy-reflecting white roof.

Through an ESPC, Johnson Controls has provided funding based on anticipated energy and operational efficiencies for a three-phased approach.

An investment in new boilers at the National Interagency Fire Center in Boise, Idaho provides energy efficiency for decades to come.

their sites. Because agencies may have limited staff and expertise, they have begun to partner with energy services companies, such as Johnson Controls, to finance the projects, bundle management and streamline project execution. Using pre-qualified vendors on Indefinite Delivery, Indefinite Quantity (IDIQ) contracts means a simplified approach and reporting accountability.

The Denver-based BLM National Operations Center (NOC) team was ahead of the pack as it created a far-ranging strategy in 2006. Through an ESPC, Johnson Controls has procured project funding based on anticipated energy and operational efficiencies for a three-phased approach.

In Phase 1, BLM implemented a project in two centrally located sites in Boise, Idaho. In Phase 2, Johnson Controls teamed with BLM to perform detailed energy surveys at about 10 percent of the field facilities in six western states. Based on this sampling, energy efficiency opportunities were generated for the specific Phase 2 sites, and a consistent approach was instituted to efficiently develop and implement energy savings based improvements at other BLM sites.

In general, BLM sites broke down into two areas:

- **Engineered sites** - Large facilities that annually use more than $25,000 of electricity and natural gas. Johnson Controls implemented upgrades such as providing new boilers, air handlers, ground source heat pumps and HVAC controls; commissioning of existing energy management and control systems; replacing standard T12 and incandescent lighting with T8 and compact fluorescent lighting; and installing occupancy sensors.
- **Prescribed sites** – Small, remote facilities scattered throughout the West that annually use between $1,000 and $5,000 of electricity. These sites received programmable thermostats, replacement of standard T12 and incandescent lighting with T8 and compact fluorescent lighting, and occupancy sensors. To minimize costs an installation team and a truck equipped with ladders, tools, lighting fixtures, occupancy sensors, and programmable thermostats travelled from site to site. While at the location, the team then completed the installation, commissioned the systems and closed out the site-specific project before moving onto the next area. The process eliminated the need to revisit the site, thus keeping costs low.

The team was honored with a 2007 Presidential Award for Leadership in Federal Energy Management for its efforts in the first two phases.

Focus on renewables

With President Obama's goal for the country to generate 25 percent of its energy from renewable resources by 2025, a third phase of the project focused on photovoltaic and wind energy. A six-year, $18.5 million ESPC provided additional energy conservation measures, including nearly one megawatt of renewable energy power. Besides being one of the largest renewable projects under a federal ESPC, the project used ARRA dollars to augment the energy savings. This phase included two especially noteworthy renewable elements:

- **Photovoltaic** – The Anasazi Heritage Center in Cortez, Colorado has an impressive solar array with

400 panels divided between a 100-kilowatt solar garden and 38 kilowatts of photovoltaics on the roof. The new roof was installed in conjunction with the ESPC project, thus providing a much-needed facility upgrade. The project's goal is to produce at least 60 percent of the power needs from solar energy for the 40,000-square-foot building. Excess power feeds into the local power grid.

- **Wind Power** – A new 120-foot wind turbine at the BLM Field Office in Rawlins, Wyoming has blades 70 feet in diameter and is rated at 100 kW with an estimated output of 300,000 kW hours per year.

Because of its track record with similar BLM projects, Johnson Controls was able to meet an unusually tight government procurement timeframe, expediting the development process to just six months for Phase 3 instead of the average one to two years. In this phase, energy measures will save 10.7 million Btus annually and lower carbon emissions by more than a half-million pounds of CO_2 per year for estimated annual savings of more than $800,000.

A variety of employee engagement activities through onsite interactive energy-tracking kiosks have expanded the impact as BLM's sustainable strategies and are marketed in the site's community. Perhaps most important, a rigorous measurement and verification process and multi-state energy tracking and metering system has been developed. Energy consumption and generation is calculated at larger sites so BLM can better manage its energy usage and effectively communicate its progress to the individual sites, agency, Congress and the public.

The BLM district office in Salem, Oregon showcases the agency's commitment to renewable energy with this ground-mounted 100 kW photovoltaic field.

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Expected annual savings include:

- Reduced energy use by 30% of FY 2005 baseline data
- Reduced energy costs by $1.2 million
- Reduced energy consumption by 30,758 MBtus
- Reduced 7 million lbs. of greenhouse gases

Bureau of Land Management

- Oversees 258 million acres of public lands primarily located in 12 western states.
- Lands comprise about 13 percent of all U.S. land surface and more than 40 percent of all land managed by the Federal government.

A 25 kW photovoltaic field helps power a horse corral complex in Wyoming.

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Printed on recycled paper.

 Printed in USA CSST-11-171
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