DOE's Energy Savings Performance Contracts Stretch Budgets at the Bureau of Indian Affairs

At the Sherman Indian School in California, a Department of Energy Super ESPC is helping the BIA save energy, improve building efficiency, and install renewable energy

ESPC Case Study

Overview

The U.S. Department of the Interior's Bureau of Indian Affairs has found a good way to reduce energy costs, replace inefficient lighting and aging building equipment, and install renewable energy systems without huge increases in the BIA budget. The agency is doing all this by making use of the Department of Energy's (DOE's) Super Energy Savings Performance Contracts (Super ESPCs) at BIA schools and facilities throughout the country.

Reduce Utility Bills with Energy Savings Performance Contracts

The Department of Energy's Federal Energy Management Program (FEMP) helps government agencies use Energy Savings Performance Contracts (ESPCs) to finance many kinds of energy efficiency projects.

Benefits of ESPCs:

- New equipment
- No up-front costs
- Energy and water savings
- Lower utility bills
- Improved reliability and load management
- Better air quality

FEMP has developed streamlined "Super ESPCs" so Federal agencies can contract with preselected energy service companies to implement projects. FEMP's six Regional Super ESPCs allow agencies in a particular U.S. region to place delivery orders with the preselected companies. Technology-Specific Super ESPCs can help any facility in the country obtain access to financing for certain advanced energy technologies.

Advantages of Super ESPCs:

- Prequalified, competitively selected energy service companies
- Expedited contracting process
- Ability to combine multiple projects or facilities in one contract
- DOE's technical and contracting expertise

For more information, please call 1-800-363-3732 and see FEMP's Web site (www.eren.doe.gov/femp/financing/espc.html).

BIA's first four Regional Super ESPC projects alone represent $12 million in infrastructure improvements that will reduce energy use more than 40% at the four sites. Sherman Indian High School in Riverside, California, is one good example. This project features several energy-efficient technologies (see page 2), improves the facility's infrastructure, and includes a solar electric system to help provide uninterrupted power. The project will reduce energy use by almost 40% at the school and trim operations and maintenance (O&M) costs by nearly $30,000 per year.

Background

In 1997, BIA energy manager Bill Coursey began discussions with staff in the DOE Western Regional Office in Seattle. He wanted to know if ESPCs would be a solution to a major backlog in infrastructure repairs and equipment maintenance at BIA facilities. They determined that ESPCs could help BIA reduce the backlog, maintain or improve the comfort of its facilities, and reduce utility costs. Among other projects, in 2000 a delivery order under the Western Regional Super ESPC was signed for work needed at the Sherman Indian High School in Riverside.

Timothy L. Kehrli/PIX10266

This photovoltaic energy system should provide nearly 7 kilowatts of clean solar electricity to the Sherman Indian High School campus.

Sherman Indian High School dates back to the early 1900s. Located on 88 acres, this boarding school serves from 350 to 650 students in approximately 500,000 square feet of facility space. Before the Super ESPC retrofits, annual energy and water use at the facility was estimated at 3,756,000 kilowatt-hours of electricity, 140,743 therms of natural gas, and 36,818 cubic feet of water. Utility costs exceeded $450,000 per year.

U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy

Project Summary

SEMPRA Energy Solutions was selected as the energy service company for the Sherman Indian High School project under the Regional Super ESPC. SEMPRA agreed to install a new photovoltaic (PV) solar electric system as part of the project. The PV system had already been purchased with DOE funding, but it had not been installed because of budget constraints. Under the 22-year contract, SEMPRA guarantees the following:

- *Lighting retrofits and additional exterior lighting*. High-efficiency electronic ballasts and T-8 fluorescent lamps replaced all T-12 fluorescent lamps and magnetic ballasts; LED signs replaced all incandescent exit signs. Occupancy sensors were installed in selected classroom and office areas, and exterior low-pressure sodium fixtures were replaced with metal halide lamps. All these measures reduce energy costs.
- *Installation of a 6.9-kilowatt PV system*. The system includes PV modules, inverters, storage batteries, and programming to maximize output during peak energy-use periods. Training in PV system design and installation was provided for 15 local participants.
- *Heating, ventilation, and air-conditioning (HVAC) modifications in administrative and classroom buildings and one dormitory*. Ten 30-year-old, multizone rooftop units gave way to high-efficiency, single-zone units that allow true variable-air-volume system control, including economizer cycling. A boiler and hot water system in one dormitory was replaced with a gas-fired, forced-air HVAC system to allow heating and split-coil cooling.
- *Time clock controls for the weight room, HVAC, and waterwell pump*. Time clocks were added to ventilation fans and HVAC units for the weight room to reduce operating hours and limit operation of the waterwell pump to off-peak periods.
- *Pool cover and ventilation controls*. A new automatic pool cover and humidity ventilation controls is reducing excess humidity and heat loss during unoccupied periods.
- *Pool pump control*. An adjustable speed drive was installed with a flow meter to control the pool filtration system and reduce flow during unoccupied periods.

These energy conservation measures (ECMs) provide new heating and cooling controls and greater energy efficiency at the site. New air-handling units give staff more time to maintain other systems around the campus. And a new computer station in one science classroom monitors the performance and output of the PV system, providing a basis for new curriculum materials.

The BIA maintains O&M activities for all the ECMs. SEMPRA is responsible for ensuring that all annual maintenance activities are carried out and for guaranteeing the performance of the rooftop units.

Benefits of Using ESPCs

Before starting the Super ESPC process, Coursey estimated that the backlog in needed infrastructure improvements and equipment repairs throughout BIA exceeded $750 million. Since then, he has made a significant dent in that backlog in four facilities, and he hopes to keep going until all viable BIA Super ESPC projects are completed. Through Super ESPCs, BIA can make repairs before they become emergencies and stretch funds already allocated to various projects, saving on future energy and water costs.

Lessons Learned

During the first four Super ESPC delivery order projects, BIA staff learned that the ESPC process requires a high level of commitment and effort. For example, to ensure success, each project requires 200 to 300 hours of dedicated staff time to uncover energy-saving opportunities, evaluate them, and oversee implementation. Each project also requires the dedication of maintenance and engineering staff as well as flexibility and support from management and instructional staff during construction work.

Looking Ahead

The BIA is assessing new opportunities to retrofit other facilities, factoring in the size and condition of the facility and the availability of other funds. As an energy champion, Coursey has made a significant contribution to the success of this endeavor and has established the momentum needed to ensure future successes.

For More Information

Tatiana Strajnic, Project Financing Team Leader
U.S. Department of Energy
Federal Energy Management Program
1000 Independence Ave., S.W.
Washington, DC 20585
Phone: 202-586-9230
Fax: 202-586-3000
E-mail: Tatiana.Strajnic@ee.doe.gov

Printed with a renewable-source ink on paper containing at least 50% wastepaper, including 20% postconsumer waste

FEMP Help Desk:
800-DOE-EREC
(363-3732)
Internet:
www.eren.doe.gov/femp

Produced for the U.S. Department of Energy by the National Renewable Energy Laboratory, a DOE national laboratory

DOE/GO-102001-1469
November 2001