Mohave County Takes a Comprehensive Approach to Energy Efficiency in County Buildings

Project Statistics

County: Mohave County, Arizona
Project Scope: Energy retrofits in 15 county buildings; addition of solar tube lights in 3 buildings
Project Cost: $407,000
Completion Time: ~18 months--To be completed Spring 2011
General Contractor: McAelin Electrical

Overview

Mohave County, Arizona has taken an aggressive approach to energy efficiency in county buildings through their Capital Improvement Energy Retrofit Program (CIERP). Improvements include installation of energy efficient electric lighting, solar tube lights, and new HVAC and cooling systems, as well as amenities to promote bicycle commuting.

Challenge

Arizona counties are especially struggling with budget challenges, and Mojave County is looking for solutions anywhere it can find them.

Solution

To meet budget challenges that the county anticipates will last long into the future, Mohave has decided that tackling energy efficiency is one of the best investments it can make to shore up its future.

In 2005 Mohave County performed an energy audit of all county buildings and established a 20% energy reduction goal. To meet this goal, county buildings now feature:

- Energy efficient lighting fixtures, including motion-sensors (5 buildings)
- Solartube Daylighting Systems to bring in more natural light (3 buildings)
- New, high-efficiency HVAC systems (6 buildings)
- New, energy management system software and equipment (7 buildings)

In addition, Mohave County's upgraded buildings incorporate a variety of long-term, cost-saving benefits. For example, the Development Services Building, built in 2009, is the second LEED Certified Green Building in northwestern Arizona (the first being the Mohave County Administration Building in Kingman).

New and retrofitted buildings feature more efficient cooling solutions, rather than traditional air conditioning. Cooling solutions take advantage of natural systems to circulate air throughout buildings more efficiently during the summer months.

Solartube lighting systems allow sunlight to be reflected down from domes on buildings' roofs. The placement of solartubes maximizes the use of natural light in buildings and reduces dependence on electric lighting. County buildings are also equipped with sensors that measure the amount of sunlight hitting the solar collection domes. If the sun is very bright, the sensors will cut back on electrical lighting.

New buildings feature bicycle racks, locker rooms, and shower facilities for those who choose to bike to work. "Each of these buildings is being designed to serve community for at least 50 years," Gene Hepler, Manager of Mohave's Office of Management and Budget, said. "With all the energy efficiency designed into these structures, the payback in cost-savings will be phenomenal."

Mohave's Development Services Building (above) is the 2nd LEED certified building in northwest Arizona and features a sustainable cooling system.

Solar Lighting

According to the USEPA's ENERGY STAR program, lighting is responsible for about 13% of energy consumption in commercial buildings. Solar lighting can reduce the amount of power that facilities need to obtain from outside sources.

Indoor solar lighting is called daylighting, which is essentially the strategic positioning of apertures, or openings, to allow sunlight into facilities.

Solartube lights are used to transport natural or artificial light. Solartube lights often refer to a tube or pipe used to transport light to another location, while minimizing light loss.

Solar tube lights installed in Mohave County buildings.

Additional Projects

In addition to the county facility upgrades, Mohave County has undertaken several other sustainability projects worth noting, including:

- Mohave County Wind Farm
- Distributed generation of solar energy
- Renewable energy job training in partnership with Mohave Community College

County Benefits

This project resulted in:

- 20% energy reduction
- Over $250,000 savings in energy costs
- Retention of 1 Facilities staff position
- Achievement of 13 Energy Star certified buildings

Financial Benefits

Mohave is saving money through increased energy efficiency and by reducing the cost of preventative maintenance, such as upgrading lighting and HVAC systems. Mohave County spends $41.6 million annually on utilities. A 20% reduction in energy use will mean significant cost savings that can be spent on other activities or hiring new staff.

On-going Measurement and Verification

Counties that track their energy consumption using the Environmental Protection Agency's Energy Star Portfolio Manager and receive an EPA rating of 75 or higher are eligible for recognition. Mohave has been using Energy Star Portfolio Manager to track energy savings and obtain Energy Star certifications for 6 years. This year Mohave attempted to earn 10 Energy Star Certifications, but estimates it will actually earn 13.

Lessons Learned

Mohave County faced some construction challenges related to asbestos and historical preservation. The county learned to be adaptable in their work. For example, altering plans to put solar tubes in particular buildings.

Gene Hepler noted that an energy conservation project, like Mohave's, is best accomplished when county staff understand the environmental and cost-savings associated with projects and actively promote county efforts.

By working closely with the County's Public Information Officer to develop press releases, the Office of Management and Budget was able to circulate information about the Energy Star and LEED Certifications and additional sustainability strategies to the public. Internally, county staff has benefited from education about energy management. Hepler said that it has been "a great opportunity to have this money to go forward in our organization."

Links

http://resource.co.mohave.az.us/Repository/PressReleaseDocuments/Solartubespdf_633964809523241250.pdf
http://co.mohave.az.us/ContentPage.aspx?id=114&cid=16
http://www.co.mohave.az.us/ContentPage.aspx?id=116&cid=319