Case study

State of Utah

Salt Lake City, Utah

Solar for Schools Combines Technology with Teacher Training and Student Engagement

With almost 900 public schools and 492,000 students, the state of Utah is concerned about promoting rigorous academics for students while keeping to budget. A federal program is helping by providing statewide curriculum on energy efficiency and renewable energy while at the same time funding solar demonstration projects at selected schools across the state. Johnson Controls is coordinating implementation of all elements.

Rewarding Innovation

In 2010, when Utah Governor Gary Herbert announced his 10-year energy initiative, he said "It is only when we reward innovation, invest in infrastructure and energy efficiency, and responsibly and safely develop and transport the energy resources with which Utahan's have been abundantly blessed that we will truly ensure future energy success."

Solar for Schools is an innovative program that is helping fulfill the initiative. When the Utah State Energy Program received funds from the American Reinvestment and Recovery Act (ARRA) to install and promote renewable energy, it issued a request for proposals for qualified contractors. Johnson Controls, which had installed more than 500 solar projects and works with hundreds of school districts around the country, submitted the winning proposal. Its local Salt Lake City office is overseeing the

Johnson Controls

"We definitely believe that this is a wise investment with a payback that will not only create additional resources that we can put into other things, but also create great opportunities for students.

Martell Menlove
Utah Deputy State School Superintendent

design and installation of a statewide energy education and technology initiative with four components:

- Technology
- Teacher Training
- Web-based Reporting
- Student Engagement

State of the Art Technology

The program funded 73 five kilowatt high-efficiency, mono-crystalline silicon solar modules, along with an inverter with built-in disconnects, mounting rack, specification sheets and full warranties.

The goal is to mount at least one module in each of the state's 41 districts. Johnson Controls worked with the state and each local district to select schools that had an existing infrastructure to support the system. Teaming with qualified local contractors, Johnson Controls provided training in renewable energy and created green collar jobs for workers to install the panels and help school facility staff ensure performance.

"One of the great things about the installation is that it doesn't interrupt the ongoing operation of the school. You basically install these panels in a place that is appropriate for the right sun, and you wire it into the building," says Chuck McGinnis, Johnson Controls.

Training Teachers in Common Core

But it's more than just solar panels. Through a Johnson Controls partnership with the National Energy Foundation (NEF), K-12 teachers in each district can receive a full day of hands-on training with teaching tools, experiments and small solar panels. They learned about renewable energy and energy efficiency and found out how those lessons meet state standards when integrated in science, technology, social studies, math and language arts.

Utah is one of over 40 states and territories that has agreed to transition its core standards for English Language Arts and Mathematics to a set of standards common to all states. This "Common Core" initiative is organized and supported by the National Governor's Association and the Council of Chief State School Officers, so the training and lessons can be applied in many other states.

"For example, in the primary grades, we focus on activities that specifically teach about the power of the sun. For middle school, we show how energy is transformed. Then it gets a little more technical at the secondary level. We show the technology and demonstrate how the science objectives are integrated into the technology objectives," says Elissa Richards, NEF.

"The training has been perfect because it's hands on, and that's how I teach" says Utah teacher Laura Wheeler.

Web-based Reporting

The solar panel is connected to a monitoring system so students can track live data from the solar installations and measure the effects of temperature and location on the energy output. They also can go online to a special website and compare the data with schools throughout the state.

Engaging Students in the Classroom

The program provides a variety of other ways to engage students, including a statewide slogan contest. Students can suggest catchy themes to promote wind, solar or other renewable energy, and a team of teachers and NEF selects a winner. A poster is designed and distributed to all the classrooms.

Teachers and students also are encouraged to participate in the Johnson Controls Academy of Energy Education's Igniting Creative Energy competition. After students learn how their own wise energy or water choices and environmental stewardship can help reduce energy consumption and improve their communities, they use their creative talents to communicate their ideas and actions to others. Winners are invited to participate in the National Energy Efficiency Forum in Washington, D.C., where they can share their ideas with energy and government leaders.

Multiple Benefits

Solar for Schools is generating a lot of energy beyond the building, too.

- **Community Engagement -** "People get inspired when they see things happen within their school districts. The people who live in this community, the people who attend school board meetings, the people who read about it – it's a win-win in so many different ways," says Gil Sperling, Senior Advisor for Policy and Programs at U.S. Department of Energy.
- **Green Jobs -** The solar industry is one of the fastest growing sectors of industry. "We're creating a well-trained and educated work force here for the state of Utah," says teacher Mike Cowen.
- **Environmental Benefits -** The total statewide installation is expected to remove more than 8,000 tons of carbon dioxide from the atmosphere over 20 years, equivalent to the carbon offset that would be generated by planting 11,000 trees and letting them grow for ten years.

Solar for Schools is poised to be a model for other states as they strive to make education relevant.

"We think this is just a great example of a clean energy program and an opportunity to translate that to the next generation," says McGinnis.

"I think it says we value energy, we value education, and we value investment in our community and our kids."

Elise Brown
Utah State Energy Program

"We're strongly supportive of this effort in terms of clean energy, in terms of job creation, in terms of environmental improvement and carbon reduction. And we strongly would encourage other states to take a look at what Utah's doing and use them as a model."

Gil Sperling
U.S. Department of Energy

Printed on recycled paper.

www.johnsoncontrols.com

Johnson Controls