



Clovis Unified Using PG&E's Energy Efficiency Programs



Central Valley School District Retrocommissioning School Facilities

The Clovis Unified School District is leveraging PG&E's Retrocommissioning program to upgrade the energy management of every school in the district, improving the educational environment and increasing staff efficiency while reducing energy consumption and costs.

With a PG&E rebate of over \$105,000 and anticipated energy cost savings, project payback will be only 1.2 years.

High Standards, High Objectives

The Clovis Unified School District, in California's Central Valley, is comprised of 43 elementary, intermediate and high schools and six alternative education campuses, which are served by nearly five thousand employees. CUSD schools have been named 29 times to the National Blue Ribbon Schools Program, making CUSD one of the most prestigious and honored school districts in California.

Several years ago, CUSD initiated an energy conservation strategy designed to reduce energy costs and the district's carbon footprint while keeping students and teachers more comfortable in their classrooms, thus enhancing the learning environment. The first major step was the deployment of a new energy management system (EMS) for monitoring and controlling electric lighting and HVAC systems at every school in the district through one central web-based communications port. The EMS enabled the district's energy manager, Gary Foster, to access real-time energy use data from any individual school or the entire district via a laptop computer and turn electrical systems on and off remotely. Most of those systems operate heating and air conditioning in permanent buildings and temporary classrooms.

However, the new EMS relied on a decades-old infrastructure of on-site control points that limited the efficiency of the system. For example, the district control center could only operate the lighting in entire wings of buildings, rather than individual rooms. And before school holiday periods, like Thanksgiving and winter break, staff had to go out to the facilities, particularly the portable classrooms, to make sure the lights and HVAC systems were turned off.

A systematic energy audit of the district's schools and facilities pointed to measures that could be taken to increase efficiency, including upgrading the on/off functions for HVAC and lighting systems and changing out DX units, (the HVAC units that hang on the outside of portable classrooms). To implement these measures, CUSD turned to PGE's Retrocommissioning (RCx) program.

Retrocommissioning Exam

PG&E's Retrocommissioning (RCx) program is a systematic process for identifying inefficient performance in a facility's existing equipment and control systems and making necessary repairs or enhancements to save energy and reduce costs. Instead of retrofitting, which involves replacing outdated equipment, RCx focuses on improving the efficiency of the equipment already in place. Incentives are calculated based on energy savings, up to 50 percent of the cost of the measures implemented. PG&E provides engineering and consulting resources to identify and analyze potential energy saving projects from retrocommissioning measures.





The RCx process normally begins with a thorough energy audit provided by a PG&E engineering partner, but CUSD had audits already in hand from the EMS deployment, so the district was able to benefit from a streamlined process. In June of 2007, PG&E partner Enovity performed an assessment of the EMS and quickly pinpointed the most cost-effective measures to improve the efficiency of the system.

Eight schools were selected for a pilot program: Clovis High School, Kastner Intermediate School, and the Cole, Maple Creek, Mountain View, Valley Oak and Weldon Elementary Schools, as well as the Center for Advanced Research and Technology (CART), a career-specific, laboratory-based secondary education facility for advanced academics.

The RCx Schoolwork

The following measures were deployed at some or all of the eight pilot schools:

- All DX (portable classroom) units were retrofitted with individual EMS enable/disable functionality to enable HVAC systems to be turned on and off remotely;
- All pneumatically-controlled unit ventilators, which previously stayed on, were refitted with individual relays and tied into the energy management system to enable individual on-off scheduling for each room's unit;
- Pneumatically-controlled air handling units were refitted with individual relays to enable remote space temperature reset and individual unit scheduling;
- On-off switches for all HVAC units were replaced by temperature sensors for heat and air conditioning operations;
- At CART, fully automated lighting controls were installed with photocells deployed in the atrium area to detect natural daylighting and turn off the lights in the building if enough natural light is present;

- Also at CART, a temperature reset schedule was implemented for unoccupied periods during lunch hours, so the air conditioning or heat can be turned down when staff and students are not present.

The DX units, unit ventilators and air handling units were tied in to building automation systems that monitor energy requirements and consumption by zone. The units respond to system demand, which is determined by the status of each individual zone. If a zone is on, the system considers that a demand and the appropriate units and operations will be run. All units shut off when there is no demand from any zone.

A Dazzling Report Card

Clovis Unified derived immediate rewards from bringing its on-site infrastructure up to the level of its new energy management system. By addressing the two most energy-intensive applications in the eight schools – HVAC and lighting – the program produced annual savings of

- almost 600,000 kilowatt hours
- nearly 9000 therms

These savings produced an RCx rebate of \$105,115, and with the anticipated energy cost savings added, the payback for the project will be approximately 1.2 years.

CUSD also saw immediate and significant operational benefits from the upgrades. The district energy manager can now remotely schedule off/on times for one or two individual rooms, rather than an entire building or wing, for the extracurricular activities that frequently take place on the various campuses during after-school hours and on Saturdays. Being able to power up just the space required, while leaving the remainder of the campus switched off, produces massive energy savings and makes control and maintenance easier for the on-site energy managers.

Increased operational control has enabled staff to run better diagnostics and detect and handle problems remotely, without dispatching maintenance personnel to the site. And staffers are no longer required to inspect portable classrooms and other facilities to confirm they've been switched off for the holidays – on/off status can be confirmed and executed remotely.

The district was so pleased with the overall results of the pilot project that it immediately committed to extending similar measures to all other feasible schools in the district – over 40 additional sites within five years. The upgrades will be scheduled in annual phases of 8-10 schools per phase, unless the district is able to secure federal infrastructure stimulus funds, which would accelerate the process. CUSD expects to enroll each of these projects in PG&E's Retrocommissioning Program thereby qualifying for similar incentives on each phase of the program.

"PG&E's project manager, Mark Johnson, and account representative, Cheryl Marcelli McClaine, have been terrific to work with. They helped us take the data from the original audit and turn it into simple, effective energy-conservation measures that have made our classrooms more comfortable and our staff far more efficient. And by better controlling our energy use with these changes, we're saving money on our energy costs – money that can be put into the classroom where it belongs. PG&E's people are superb communicators, and I would recommend their programs to anyone." – John Poytress, Director of Plan Operations, Clovis Unified School District

Extra Credit: Pools, Gyms and an Energy Center

CUSD has moved beyond its retrocommissioning efforts into other energy-saving projects, several of them focused on athletic facilities. The district's 11 swimming pools (three of them Olympic-sized) now sport heat-retaining pool covers that have saved nearly 200,000 therms. A PG&E rebate of more than \$58,000 covered over half the capital cost of the pool covers, which, combined with the energy cost savings, enables CUSD to realize complete payback in less than three months.

A major initiative currently on the drawing board is a lighting retrofit of the district's 16 full-sized gyms (each of the five high schools has two gyms, and the remainder are at the intermediate schools). CUSD plans to replace the current metal halide fixtures in all the gyms with T5 fluorescent fixtures.

Finally, CUSD has submitted an application to PG&E for a Non-Residential New Construction incentive to build a new energy center at Buchanan High School, where students will learn about energy-efficient technologies and undergo specialized training for new-economy "green" jobs.

Next Steps with PG&E

To learn how PG&E can help your school or school district manage energy consumption and reduce costs, contact your local PG&E representative or call our **Business Customer Service Center** at **1-800-468-4743**. More information is available at www.pge.com/schools.

...by better controlling our energy use with these changes, we're saving money on our energy costs – money that can be put into the classroom where it belongs...

...I would recommend PG&E's programs to anyone."



John Poytress
Director of Plan Operations
Clovis Unified School District





"PG&E" refers to Pacific Gas and Electric Company, a subsidiary of PG&E Corporation. ©2009 Pacific Gas and Electric Company. All rights reserved. These offerings are funded by California utility customers and administered by PG&E under the auspices of the California Public Utilities Commission.



PG&E prints its materials with soy based inks  on recycled paper. 

January 2010

CTM-1209-0304