Business New Construction

BETHKE ELEMENTARY SCHOOL—FORT COLLINS, COLORADO

Energy Report Card – Bethke Elementary School

XCEL ENERGY FUNDING	
Energy Modeling Cost	$26,993
Rebates	$65,450
Total Money Provided on Project	**$92,443**

ENERGY SAVINGS*	
Increase in Upfront Building Cost (Energy only)	$123,000
Estimated Annual Energy Cost Savings	$34,570
Annual Electrical Savings	274,257 kWh
Annual Natural Gas Savings	234 MMBTU
Total Conditioned Area	63,000 sq. ft.
Electric Peak Demand Savings	64%
Payback Term	**Less than 5 years**

*Statistics based on the International Energy Conservation Code 2003

The Problem: Taking on Climate Change Through Green Build Design

The Poudre Valley School District (PSD), based in Fort Collins, Colo., began a commitment to building as green as possible that started back in the 1990s before ratings and certifications existed. In the beginning, they used things like daylighting and high-efficiency lighting before such tactics became more mainstream.

In 1999, PSD formed a green team to look at the most efficient practices. "LEED was just getting off the ground," said Stu Reeve, Energy Manager for PSD. "That was one of several tools we'd use to create our own sustainable practices. Our triple bottom line became building the best school possible with energy conservation, the economics of conservation and balancing that with environmental stewardship in mind. We learned a lot, but we knew better than to think we had all the answers. With each building, we'd ask, 'How can we improve the next time and learn from the previous school?'"

The Xcel Energy Business New Construction program provides a source of energy expertise to encourage energy efficiency in building design and construction practices. Services can include energy modeling, funding to offset the cost of design time associated with energy analysis, financial incentives to improve the cost effectiveness of energy-efficiency measures and field verification to ensure strategies are implemented. Best of all, the entire process is FREE to Colorado Xcel Energy customers.

As part of the Business New Construction offering, we offer a variety of unique programs designed to fit the specific needs of builders, contractors and architects, including Energy Design Assistance, and Energy Efficient Buildings.

15-06-409 | 06/2015 | CRS 3072

After a decade of learning about energy-efficient design, PSD took steps to partnering with energy leaders to begin construction on Bethke Elementary School.

The Solution: Partnerships with Energy Leaders

PSD uses an integrated design approach to avoid expensive retrofits later on. They invited everyone to the table during the preliminary design phase, including the architect, engineers, contractor and energy partners like Xcel Energy, to maximize the advice and expertise of each discipline while they were designing the building as a whole.

The result is a building designed to promote greater student and staff productivity, less absenteeism and better health, to have less impact on the environment and provide operational cost savings.

By partnering with Xcel Energy, the Department of Energy, the Colorado Governor's Energy Office and Environmental Protection Agency's ENERGY STAR® program, they were able to approach each building phase to maximize the return on investment. For example, working through Xcel Energy's Energy Design Assistance program, the district received a free comprehensive computer energy model (valued at $26,993), which predicted energy use, suggested energy-saving strategies and projects energy cost savings.

Xcel Energy followed up with site verifications to ensure that selected strategies were installed correctly and working to save energy bills. Recommended strategies also qualified for cash rebates, which decreased the out-of-pocket costs and improved the return on investment. Xcel Energy's rebates for the project totaled more than $65,000.

Reeve says these various projects have proven that high-performance, sustainable schools could be done. "If you give people the latitude to be innovative, it's amazing what can be done within tough parameters," says Reeve. "We just needed to be smart with the money we were spending."

They also spend more on the design phase of each building. If a typical budget allows for five to six percent spending on design, Reeve says they spend closer to eight percent. PSD would rather take longer on the front side of the project and get it built correctly. They seem to be doing things right: average payback has been five years or less.

The Result: An Award-Winning School

Bethke Elementary School is the first school in the country to achieve the Gold LEED certification (Leadership in Energy and Environmental Design), the first school ever to receive three Green Globes out of four from the Green Buildings Initiative and was designed to earn the ENERGY STAR award.

"It's amazing to see how far we've come," said Reeve. Reeve is quick to credit partners like Xcel Energy's Energy Design Assistance program for these achievements. "We know people who know what they're doing."

Bethke Elementary is seventh in the District's growing line of high-performance buildings. PSD's team goal is to make each one better and more efficient than the last, but this one might be tough to top.

The 63,000 sq. ft., two-story building will use roughly 40%–50% less energy to operate than a comparable school designed without sustainability features. Among other things, it involves a state of the art evaporative system to address its cooling load and allow for

Energy Design Elements for Bethke Elementary include:

- Direct/indirect evaporative cooling
- High-efficiency boilers for heating
- High-efficiency/on demand boiler for domestic hot water
- Full control of lighting and HVAC with building automation system
- High-efficiency automated irrigation system and low water use landscape design
- Increased wall and roof insulation
- Tower-free cooling
- High-performance glazing
- Reduced lighting power density
- Stepped daylighting controls
- ENERGY STAR equipment
- Displacement ventilation in gym and cafeteria
- Solatube daylighting
- Heat recovery
- Premium efficiency electric motors and variable frequency drives on all motors above 1 hp and larger
- ~10 kW photovoltaic system to be installed later this year

All of these things increase the building's efficiency, reliability and comfort and simultaneously decrease energy usage, costs and maintenance.

year-round air conditioning, a super-insulated building envelope, high-efficiency boilers, and operative windows that provide daylighting to 90% of the building's interior.

Other energy-efficient features include building orientation, site design, displacement air strategies and carbon dioxide sensors to control ventilation. Using a "micro-loaded" strategy, the building also reduces heating and cooling costs by about half compared to a conventionally designed building.

More to Come

Bethke Elementary is in good company in the district. Of the seven high-performance schools the Poudre District has built since 2000, several have achieved awards. Fossil Ridge High School received Silver LEED status in 2005, as well as the ENERGY STAR national Leadership in Energy Management award in 2003. The district has earned 87 ENERGY STAR labels for schools since 2000, out of a total of 168 in Colorado.

The PSD team will tell you it takes the involvement of everyone to think green. "We have our little environmental posters that help the students focus on reducing electricity," says Reeve. "We teach them to turn off the lights and educate them about things like recycling to divert trash from landfills. Everybody gets it—including the community around us."

Reeves future goals keep getting loftier. One involves something called "Net Zero" energy

use. It requires that 100 percent of the building's energy be supplied by on-site renewable energy. Given what he's already achieved, nothing is impossible.

Make Xcel Energy a Part of Your Design Team

When you start thinking about a new construction project, bring us in on your team. We'll work with you and your architect to integrate cost-saving, energy-efficient options that pay for themselves quickly—average payback term is three years—and continue to pay off in substantial energy savings each month.

To find out more about how Business New Construction can help you reduce energy costs or to apply for the program: call your Xcel Energy account manager, or call our Business Solutions Center at **1-855-839-8862**. Email energyefficiency@xcelenergy.com or visit us at xcelenergy.com/BusinessNewConstruction for more information.