

EDUCATION PARTNER

POUDRE SCHOOL DISTRICT, COLORADO



POUDRE SCHOOL DISTRICT

Implementation Model: Creating a Culture of Energy Efficiency

ORGANIZATION TYPE

K-12 School District, Suburban School District
Student Population: 27,000

GOAL

Enhance the learning environment while improving energy efficiency across the district's portfolio of public school facilities; Target 20% reduction in energy use intensity by 2020, based on a 2010 baseline

BARRIER

Lack of organizational and external buy-in for energy efficiency upgrades in the school district's public facilities

SOLUTION

Poudre School District (PSD) developed and executed a strategic communications and outreach campaign which illustrated the value of infrastructure and efficiency upgrade projects and resulted in an internal and external organizational change in support of the renovations

OUTCOME

PSD secured district-wide and community support for renovations of its public school facilities resulting in the passage of a \$120 million bond issue in 2010 to fund a broad array of district-wide infrastructure improvements over the next eight years, including energy and water efficiency renovation projects with an expected savings of at least \$400,000 annually; Any savings recognized in the utility budget generated by these bond-funded projects is returned to the district's general fund and used to help fund district education priorities

Overview

PSD implemented its first energy conservation plan more than two decades ago and the district continues to improve energy efficiency across its 32 elementary schools, ten middle schools, six high schools, and several support services facilities totaling 4 million square feet.

PSD passed bond issues in 1990 and 2000, both of which were for new construction, while the 2010 Bond is focused on infrastructure repair projects. Building on the long tradition of emphasizing energy efficiency, the District embraces the challenge of educating internal and external decision makers on the economic, health, and environmental benefits of energy efficient, high performance buildings. Currently, PSD is one of the most energy efficient school districts in Colorado, which is determined by both the number of ENERGY STAR certificates awarded to district buildings and by the Colorado Association of School District Energy Managers (CASDEM).

Poudre School District's Playbook



Policies

[District Energy Conservation Policy](#): Adopted in 1996 and updated in 2009 the policy affirms the district's commitment to energy efficiency in new construction and renovation projects across the district, as well as a commitment to developing and maintaining short- and long-range strategies for conserving energy and natural resources within the bounds of sound financial management.

[City of Fort Collins Climate Action Plan](#): In 2008, the City of Fort Collins adopted goals to reduce emissions: reduce emissions by 20% below 2005 levels by 2020, and reduce emissions by 80% below 2005 levels by 2050. Using 2005 as a benchmark year, PSD has set reduction goals to help the district strive to achieve the reduction goals.



Process

PSD conducted outreach activities to educate and inform various stakeholder groups to raise awareness of the economic, environmental, health, and educational benefits of improved efficiency.

- 1. Identify and Convene a Set of Internal and External Change Agents** – In 1995, PSD established the Energy Efficiency Team (EET), an extended group of change agents, which included both internal employees and external partners, to work with district administrators and employees to identify building concerns and the role of energy-efficient improvements in addressing these concerns.

2. **Creation of a Green Team** – In 1999, as a result of a growing interest in the district's energy efficiency goals by school personnel and external professionals, the Energy Efficiency Team was expanded into the PSD Green Team. Originally headed by the Director of Planning, Design & Construction, this team represented an organizational shift to cultivate conservation behaviors throughout PSD's educational environment and integrate behavioral expectations at every level – students, staff, teachers, administrators, and operational staff. PSD's operations and maintenance staff members involved in the Green Team included Custodial Services, Building Maintenance, Outdoor Services, Utilities and Energy Management, Security, Child Nutrition, Construction, and Finance; a representative from each of these departments was identified and was a required attendee at Green Team meetings.

External professionals with merging interests and expertise from state and local agencies, professional organizations, and design and construction firms, including Colorado State University, City of Fort Collins Utilities, Institute for the Built Environment, FortZED (Fort Collins Zero Energy District), and the Green Schools Alliance, were able to contribute to the team as well. Because of its multi-level organizational structure, the Green Team enables regular cross communication among district administrators, staff, students, and community members.

Past innovations from the Green Team have included ground source heat pump systems, green building materials, and use of solatubes, and the Green Team continues to research and implement innovative solutions for more than 850 bond-funded projects from the 2010 Bond. Over the course of the eight-year bond program, renovation and infrastructure repair projects will be completed at all district sites; no new construction is included in the \$120 million bond issue.

3. **Design and Implement an Effective Outreach and Communications Strategy** – In 2007, PSD formed a Mill/Bond Committee, which was chaired by the assistant superintendent of business services and was comprised of a broad spectrum of PSD stakeholders: parents; community members; representatives from businesses, industries, and higher education; PSD staff members; and PSD administrators. Subcommittees were formed for specific outreach activities, such as school engagement and communications. The Mill/Bond Committee was tasked with educating and communicating with district employees and the PSD community on the value of the infrastructure and efficiency upgrade projects included in the 2010 Bond, as well as fostering support for the proposed renovations of area schools. PSD was able to identify a comprehensive plan to address infrastructure needs throughout the district, and embraced these infrastructure needs as an opportunity for improved comfort, modernization, and energy efficiency. These areas were examined by comparing energy use data before and after infrastructure projects, and tracking occupant calls regarding comfort (rooms being too hot or too cold).

Bilateral communication was developed via group meetings, interactive events, and telephone calls to deliver a compelling case for the bond issue. In addition, the district worked to identify and publicize the benefits of improved efficiency, including money saving opportunities, investing in more efficient materials to capitalize on long-term savings, and public recognition of renovated facilities.

4. **Engage Subject Matter Experts** – In 2000, PSD leveraged the resources of The Brendle Group, a Fort Collins-based sustainability consulting firm, to help the district establish the [Sustainable Design Guidelines](#). In 2005, PSD worked with the Brendle Group to revise the Sustainable Design Guidelines ([Sustainable Design Guidelines \(2005\)](#)).

In 2006, PSD partnered with The Brendle Group to develop the [Sustainability Management System](#), which serves as the district’s framework for sustainability. Since 2006, this framework has been reported on annually by PSD’s Facility Services Department in the [Annual Sustainability Report](#), which highlights the district’s sustainability management practices in the areas of resource conservation, greenhouse gas emissions reductions, sustainable education, transportation, and health and wellness for 33 departments and 13 schools.

PSD consulted with Jennifer Cross, a professor of sociology at Colorado State University, to research the district’s sustainable behavioral change and develop a model of this change. Cross focused on individual obstacles, including presumed associations and beliefs that “green” costs much more, as well as organizational obstacles the district faced – lack of information feedback, inertia, and lack of understanding the “green” language. Through interviews with PSD operations staff, teachers, and administrators; ongoing data collection; and document analysis, Cross was able to demonstrate how appropriate framing combined with internal restructuring could generate support and overcome resistance. Cross and her associates used a data-driven approach to support recommendations for PSD. ([See Becoming a Leader in Sustainable Building: Organizational Change and Issue Framing in Poudre School District](#))

In 2007, PSD worked with a local architectural firm to conduct a district-wide [Facility Condition Audit](#) to determine infrastructure needs across each building. In addition, the Colorado Department of Education conducted School Assessment Reports in 2009 as a part of a statewide audit at all district schools which evaluated school systems on design life, installation date, life safety, next renewal, and current deficient conditions that may impact the system’s remaining service life. The findings of the Facility Condition Audit and the School Assessment Reports were compiled by PSD’s Planning, Design, & Construction Department and served as a basis for the 2010 Bond.



Tools and Resources

- [Poudre School District Sustainable Design Guidelines](#)
- [Organizational Change for Energy Conservation: Case Study of Poudre School District](#)
- [Becoming a Leader in Sustainable Building: Organizational Change and Issue Framing in a Public School District](#)
- [Sustainability Management System \(2006\)](#)
- [Annual Sustainability Report \(2012\)](#)



Outreach

PSD's Facility Services Department manages the district's [sustainability website content](#), news releases, and public announcements, and provides input on community engagement activities regarding energy efficiency and renewable energy projects.

[Energy Conservation Guidelines](#): In support of district Energy Conservation policy, PSD established Energy Conservation Guidelines which detail HVAC programming schedules and energy conservation measures that are implemented at every district building.

Tools:

- [PSD Sustainability Website](#)
- [Energy Conservation Guidelines](#)

Measuring Success



Upon completion of the year-long communications and outreach campaign, PSD was able to measure the success of the organizational shift and stakeholder network involvement by the passage in 2010 of a \$120 million bond issue to fund over 850 infrastructure repair projects over an eight-year span, including electrical upgrades, heating & ventilation renovations, plumbing fixture upgrades, irrigation systems, and roofing projects; a [detailed list of project categories](#) is posted on the PSD website. The availability of this significant funding mechanism is the result of a transparent and accountable process, effective leadership, and commitment to a long-term energy efficiency strategy. Without this referendum, these achievements would not be possible within the proposed timeframe.

To remain transparent and demonstrate continued fiscal responsibility, PSD posts [project lists](#), detailing the status and estimated budget of each project included in the 2010 Bond. [Quarterly financial reports](#) are also posted online.

Summary energy data and greenhouse gas emissions data for every school and district building is posted on the district's school energy website. This data is updated monthly by the Utility Management Department.

In addition, through use of the same integrated-design approach used for new construction, PSD was able to effectively engage decision makers and building occupants at every level, including school administration, school staff, and district operational staff, to discuss planned projects and obtain feedback.

Data Management



The successes of the renovation projects are measured by building performance and verified using data available through MV-Web, which provides next-day data utility data of all district buildings, and ENERGY STAR® Portfolio Manager (benchmarking and comparative performance). PSD also utilizes weather stations and irrigation controls to monitor real-time water usage, and utilizes building automation systems to collect trend data of district buildings.

To allow district sites to monitor and track their energy, water, and solid waste usage, PSD created a [School Energy & Solid Waste Reports](#) website, which is updated monthly by Facility

Services staff. On this website, schools can access their most current data for electric, natural gas, and water use, and charts that reflect the school's progress toward PSD's greenhouse gas emissions reduction goals.

Through these tools, successes from the 2010 Bond infrastructure projects have been measured by PSD. Examples of the successes include the following:

- Blevins Middle School: The school's kBtu per square foot per year energy use index was 60.9 prior to receiving a major renovation in 2012 which included HVAC renovations, upgraded windows, new boilers, new building controls, and plumbing fixture upgrades. In 2013, the kBtu/square foot/year index dropped to 43.3, a reduction of 29%.
- Tavelli Elementary School: the school's kBtu per square foot per year energy use index was 63.8 prior to receiving a major renovation in 2012 which included HVAC renovations, upgraded building controls, new windows, and retrofitted light fixtures. In 2013, the kBtu/square foot/year index dropped to 47.9, a reduction of 25%.



Outcomes

PSD serves as a national leader for other school districts and is the leading green building and energy conservation school district in the state of Colorado. Through sustained, long-term financing, PSD is able to pursue projects which create more comfortable and energy-efficient school facilities. These projects have enabled the district to improve building conditions and implement renovations that save money and energy, and improve occupant comfort.

In addition, PSD received approximately \$80,000 in rebates in 2013 through the City of Fort Collins, Platte River Power Authority, and Xcel Energy for energy projects completed through the Energy Efficiency Team. This money was then reinvested in additional energy efficiency projects, including lighting and plumbing fixture retrofits.