

Case study Middleton-Cross Plains Area School District

Middleton, Wisconsin



School district and community optimize energy savings

Progressive school districts throughout the country are taking steps to review operational practices and develop energy efficiency programs. In south-central Wisconsin, the Middleton-Cross Plains Area School District (MCPASD) is building on its efficiencies and working with Johnson Controls to develop innovative approaches that are resulting in an estimated \$2.6 million in savings. A similar energy efficiency project with the city is providing additional benefits. Together, these projects demonstrate the community-wide commitment Middleton has made to taxpayer accountability and sustainability.

"Best Place to Live" finds growth challenging

Located close to the Wisconsin state capitol in Madison, Middleton is highly ranked in *CNN/Money Magazine's* "Best Place to Live" for cities with populations of 50,000 and under.

The city's 17,400 residents enjoy low unemployment, many cultural and recreational attractions, a charming downtown, and many other amenities. As more people choose to live in this friendly Midwestern municipality, city and school district leaders are striving to keep pace with the growth while keeping an eye on environmental impact.

Audit uncovers district savings

MCPASD has spent years working to keep its facilities operating efficiently, led by Tom Wohlleber, assistant superintendent of business services for MCPASD, Bill Eberhardt, director of buildings and grounds, and Neal Bickler, energy manager.





An ultra-high efficiency heating and cooling system is installed at the school district administration center.

“The innovation is significant for this forward-thinking community, but saving money is even more important. It’s vital that we show fiscal responsibility to local taxpayers so they know every penny is well-spent.”

TOM WOHLLEBER, ASSISTANT SUPERINTENDENT OF BUSINESS SERVICES FOR MCPASD



With 6,000 students in 10 school buildings, including eight facilities that are at or over capacity, it’s been a challenge. A number of aging facilities also needed extensive capital maintenance for which funds are limited. The district had just completed a four-year upgrade that provided \$2.5 million in cost avoidance through new lights and boilers when Johnson Controls offered to perform an energy audit.

“When Johnson Controls came in and said they could find even more savings for us, I didn’t think they could come up with much,” says Wohlleber. “I’m impressed and pleased with the breadth of ideas they developed.”

Johnson Controls completed a preliminary audit of 12 buildings, including administrative and operational facilities, two high schools, two middle schools, and six elementary schools. Together with the district, they developed a comprehensive, \$2.6 million plan including:

- Replacing interior lighting with T8 and T5.
- Replacing exterior HPS lighting with CFLs.
- Installing LED parking lot lights.
- Removing lights from some hallways.
- Replacing inefficient boilers, including one 1937 unit, at three schools.
- Providing a new heat pump system at the district office.
- Developing a solar thermal system for a high school pool.
- Installing solar thermal for domestic hot water at two schools.
- Supplying low flow water faucets and toilets.

Performance contract pays

The project is utilizing a program that offsets the costs of improvements for the upgrades through the resulting savings. It’s called performance contracting, and it allows money that would otherwise go to pay utility bills to be re-directed back into funding the project. Johnson Controls worked with district leaders to secure \$2 million in Build America Bonds, \$500,000 in Qualified School Construction Bonds and \$200,000 in rebates from Wisconsin Focus on Energy.

“By bundling the entire project, we were able to include loose ends that hadn’t been addressed in earlier upgrades,” says Wohlleber.

The expected savings during the 14-year contract include about \$180,000 each year in reduced electricity, natural gas and water and sewer bills; improved operational efficiencies; and avoided capital expenditures. District leaders are pleased with the process.

“Johnson Controls was an incredible partner with our school district. They provided a wide range of alternatives to improve our facilities and systems. Included in this analysis was an evaluation of costs, return on investment, opportunities for federal or state support through matching funds/ grants, and an on-going willingness to re-evaluate,” says Don Johnson, Middleton school superintendent.

“They met promised timelines, responded to necessary changes, and followed up to fine tune the systems that were installed to increase efficiencies. They also provided clear and concise data regarding cost savings and system performance after the projects were completed,” he says.

Triple-Bottom-Line benefits

In addition to the dollar savings, the project brought environmental and social advantages to the community. The district's annual carbon footprint is expected to be reduced by over 1.5 million pounds of CO₂ during the next 14 years.

The project also brought about 60 jobs to the community during the construction period. Since Johnson Controls provides education and training on energy efficiency and renewable energy to its contractors, if they're not already experienced, those local businesses are now ready to install green technologies for other clients.

MCPASD's environmental performance is recognized through the federal government's ENERGY STAR® program. All school buildings have been benchmarked, and several have received the prestigious ENERGY STAR label, indicating they are in the top 25 percent of all similar buildings in the country.

City sustainability

When city leaders learned about the school district's success, they also met with Johnson Controls to determine how to expand the project to municipal efforts.

"Our common goal is to develop and implement an efficiency and sustainability program that is practical, transparent and meaningful, that maximizes cost-effectiveness and available grants, and provides an educational experience that extends to the entire community," according to the project mission statement.

Through another performance contract that utilized available state and federal funds, the City of Middleton developed an energy savings project that included several hundred efficient LED street and parking lot lights, more efficient lighting at the public library and variable frequency drives (VFDs) on municipal water pumps – again, paid back through the savings.

"Middleton prides itself on being a sustainable community, and energy conservation is one of the most important components of sustainability," says Mike Davis, City Administrator.

School superintendent Johnson agrees, saying, "We are establishing a long-range strategy to maximize dollars for student learning in comfortable, safe, quality facilities. Energy conservation, we believe, is a strategy that everyone in the community recognizes as a prudent measure to take. We will continue to monitor new technologies, strategies, and changing market conditions that might allow for more innovation to conserve."

All-America city finalist

The project helps the city meet the goals set out in its Sustainable City Plan, which was clearly noted in its recognition as a 2010 finalist in the National Civic League's All America City Awards for outstanding civic accomplishments.

"Johnson Controls has been an effective partner in energy-saving solutions with the City of Middleton. Jeff Mangan joined our All-America finalist trip to Kansas City to present for national honors, and he and other Johnson Controls employees



"The extraordinary energy savings projected for the utility's VFD are probably the most noteworthy improvement, but my favorite is the new LED lights in our decorative fixtures for our historic Downtown."

**MIKE DAVIS, MIDDLETON
CITY ADMINISTRATOR**



“Although many organizations and businesses may think that they can act on any conservation projects on their own, I recognize that without the expertise that Johnson Controls brings to the table, we would be spending hundreds of thousands of dollars unnecessarily. This project was clearly a “no-brainer” for the district. Clearly it was a win-win!”

**DON JOHNSON, MIDDLETON
SCHOOL SUPERINTENDENT**

worked with us to advise and guide our successful implementation of a program that will save energy and taxpayer dollars,” Davis says.

On to more savings

After the contract expires, the city and school district will continue to accrue the benefits through the new and efficient equipment. MCPASD is considering geothermal heat pumps at several schools, converting remaining

pneumatics to DDC controls, converting low-efficiency exterior lighting, and replacing some windows and roofs.

“The innovation is significant for this forward-thinking community, but saving money is even more important. It’s vital that we show fiscal responsibility to local taxpayers so they know every penny is well-spent,” says Wohlleber.