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Schools today recognize the importance of building strong partnerships. Many of these collaborations are directly related to academics and the achievement of educational standards; others address budget and funding issues. The Madison Metropolitan School District (MMSD) recently partnered with Focus on Energy's Schools Program to find ways to operate its buildings more efficiently and cost effectively. MMSD, with assistance from Focus on Energy, made a variety of energy efficiency improvements at many of its 45 elementary, middle, and high schools, and other district facilities. District-wide enrollment is almost 25,000 students.

This partnership with Wisconsin's statewide energy efficiency initiative offered MMSD the opportunity to fulfill an ongoing commitment to invest in high quality facilities. The sixty-plus projects that were recently completed will improve the district's operating efficiency, make the buildings more energy efficient and comfortable, and reduce energy costs each year. These projects, many of which were initiated in 2002, were completed in spring of 2003.

"The district took a comprehensive approach with this project," said Lisa Pederson, one of Focus on Energy's Schools Program Energy Advisors. Lisa worked with Doug Pearson, MMSD's director of building services, and his staff. "We examined dozens of different energy saving measures," she noted. "In the end, we agreed to implement over twelve measures, many at multiple locations."

MMSD's 45 schools include 29 elementary schools, eleven middle schools, and five high schools, plus various administrative buildings. Focus on Energy experts suggested improvements to buildings that ranged in age from 33 years old to 97 years old.

"The Madison Metropolitan School District, like most school districts in Wisconsin, is facing serious budget reductions," said MMSD's Doug Pearson. "We were working with Honeywell to find ways to save energy and the representative suggested that we contact Focus on Energy for additional assistance." Honeywell is a Focus on Energy Program Ally.

Two of the projects at MMSD involved newer technologies. First, building automation systems automatically control various aspects of a facility's operation (such as heating, ventilating, air conditioning, and lighting systems) so each system can be turned off and on automatically for maximum energy efficiency. These automatic control systems are anticipated to substantially reduce MMSD's annual electricity and natural gas usage. By installing these systems in several buildings, the district's annual energy bills are projected to drop by \$110,000 annually.

A second technology, called Vending Miser, is a controller that is attached to vending machines to power them up and down as needed. Vending machines operate 24 hours per day, seven days a week, whether they are being used or not. Vending Miser units power down machines when they are not in use, which saves energy. This technology is expected to reduce vending machine-related electricity use in the MMSD by over 100,000 kilowatt-hours (kWh) of electricity each year.

MMSD installed several additional energy efficiency measures that can be implemented cost effectively at almost any school building. These include sealing buildings to keep conditioned air inside; repairing steam traps; upgrading lighting systems; and installing variable speed drives.

Using tools such as infrared heat guns, a building sealing professional inspected each building for gaps around beams, ductwork, windows, and other potential openings. The identified gaps were sealed. By making the buildings more airtight, the district will reduce expenses and improve the comfort level of staff and students.

Faulty steam traps in buildings that are heated with boilers were repaired and replaced, which will reduce operating costs. When operating properly, steam traps retain steam within a heating unit until it releases its heat and condenses back into water. They open periodically to discharge the condensed water back to the boiler to be reheated. However,

when steam traps fail in the 'open' position, this failure allows the steam to pass back to the boiler before it has condensed, thereby reducing system efficiency. Replacing parts that fail will repair most traps and result in increased efficiency and lower operating costs.

"Our in-house steam fitters replaced at least 50 percent of the steam traps in the district," noted Doug Pearson. "This measure alone will save over 200,000 therms of natural gas each year."

Finally, MMSD retrofitted fluorescent fixtures with energy efficient T-8 lamps and electronic ballasts, and installed occupancy sensors, variable speed drives and additional measures at specific locations.

MMSD applied for and was awarded two Focus on Energy financial incentives. The district received an Implementation Grant that helped offset the costs of installing measures such as the building automation

systems and the energy efficient lighting. It also received Service Buy-Down grants to help pay for the steam trap system retrofits.

Overall, the Focus on Energy projects completed for MMSD are projected to save over two million kWh and 422 kW of electricity and 820,000 therms of natural gas annually. The energy cost savings are projected to exceed \$450,000 each year. The electricity savings are equivalent to powering almost 200 Wisconsin homes each year and providing natural gas to 820 homes.

As the director of building services, Doug Pearson's biggest challenge is to help maintain a quality educational system with very limited funding. "Maintenance funding is being hit particularly hard," he noted. "It is vital that we make every effort to reduce our energy consumption, so limited funds can go directly to the classroom. Focus on Energy is helping us achieve this goal."

**TOP 5 ENERGY SAVING MEASURES *Madison Metropolitan School District***

MEASURE	ANNUAL THERM SAVINGS	ANNUAL kWh SAVINGS	ANNUAL kW SAVINGS	ANNUAL COST SAVINGS
Steam Trap Retrofits	286,567			\$114,633
Building Automation System	202,163	695,868	25.3	\$85,241
Building Sealing	164,103			\$99,929
Fluorescent Lighting Conversion		955,546	351	\$79,459
Occupancy-Based Outside Air Adjustments	31,914	165,739		\$24,689