



## Minnesota State University, Mankato

### Energy Efficiency Brings Big Savings on Campus



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**Terry Lewis,**  
Physical Plant Director,  
Minnesota State University, Mankato

The maintenance staff at a big University with multiple buildings over blocks of campus is always looking for ways to save energy and lower their bills.

Lucky for them, multiple resources exist to help them prioritize energy efficiency upgrades and get them financing and rebates.

Terry Lewis, Physical Plant Director at Minnesota State University, Mankato and Steve Ardolf, Chief Engineer, knew there was money to be saved on campus. With a phone in hand and a plan in place, they went to work to make their school energy efficient and as smart as the students attending.

#### Partnering for Big Savings

Lewis’s responsibilities at Minnesota State Mankato are many. He manages the physical plant operations, utility plant, plumbing, electrical, grounds, general repair and automotive repair and a staff of fifty to keep everything running. 30 years of knowledge in building management and engineering helped him know where to start.

“I had worked with Xcel Energy to get rebates in previous jobs so I knew there was money out there,” explains Lewis. “We started with the state’s Guaranteed Energy Savings Project, and it took some convincing to get my bosses to sign off. They didn’t believe that we’d actually save money or that our utility would give us rebates for upgrades.”

Lewis and Ardolf worked with Ameresco renewable and energy efficiency implementer to determine a priority list, and Xcel Energy representative Scott Kurtz, who began by getting them involved with the state’s JEEP program: the Joint Energy Efficiency Plan.

“Terry was motivated from the start to get involved with the programs and start saving money,” says Kurtz. “We created a list of energy efficiency projects based on payback and rebates, and started to tackle them one by one.”



#### Project Snapshot

Projects	Upgraded motors, VFDs and all campus lighting
Xcel Energy rebates	\$500,000
Estimated annual energy savings	5.3 million kWh and \$423,000
Estimated annual energy reduction	18 percent

Ameresco audited 45 campus buildings covering 2.6 million square feet, including classrooms, offices, gymnasiums, performing arts centers, conference spaces and the student union. These were the measures they implemented in 2017:

- Extensive interior and exterior LED lighting retrofits (over 22,000 fixtures)
- Campus-wide building automation controls optimization
- Chiller Variable Frequency Drive (VFD)
- New chilled water valves
- Central plant boiler system enhancements, including controls and VFDs

The campus-wide lighting retrofit came first. From their classrooms and auditoriums to their outdoor paths and parking lots, nearly their entire campus now boasts the latest in LED technology. Students and staff appreciate better visibility inside and a safer campus outside. Security cameras can now see license plates and faces late at night.

“We wanted to retrofit the entire campus at once so they could immediately reap savings and continue to save on energy bills and maintenance costs for years to come,” explains John Neville, Regional Director at Ameresco. “Many of these bulbs have a 20-year life span. That saves crews hundreds of hours they’d otherwise spend changing bulbs.”

They quickly moved down the list, completing nearly 20 energy conservation projects in 2017. They spanned the portfolio of Xcel Energy rebate offerings: lighting, VFD’s, motors, cooling, controls and Energy Design Assistance for new construction. These projects will save them an estimated 5,346,000 kWh and 2,048 therms annually. According to the EPA’s Greenhouse Gas Equivalencies Calculator, that’s enough energy to power 430 homes.

Their efforts also earned them more than \$500,000 in Xcel Energy rebates.

The changes reduced their annual energy usage by 18 percent and will save them roughly \$423,000 per year. Lewis plans on using those saving to implement more energy conservation strategies in the years ahead.

### Moving Forward

As a result of these projects, Minnesota State Mankato is now a leader in campus-wide lighting efficiency. Their efforts won them a Minnesota Clean Energy Community award from the Commerce Department, an acknowledgment of the work done by Minnesota communities to further the state’s clean energy goals by implementing programs, policies, and technologies that encourage energy efficiency, conservation, and renewable energy generation.

In addition to accolades and lower bills, decreasing the electric load had yet another benefit.

“The infrastructure on campus was nearing limits with power availability,” Lewis explains. “We took that load away with the higher-efficiency equipment. We’ve since re-organized how our power is distributed and improved the process since we now have more capacity.”

Lewis and his staff of supervisors will continue to take on energy efficiency projects one at a time knowing there will always be work to do and Xcel Energy rebates to gain.



### Customer upgrades and benefits

- Annual CO2 reduction of 4,464 metric tons
- Improved lighting created brighter spaces and safer conditions
- VFD pump speed reduction
- Outdated boiler controls removed and replaced
- Central plant upgrades including improved feed water and de-aerator controls, precise control of chilled water to free-up chiller capacity, and installation of Chiller #2 VFD; chiller modulation for improved performance

For more information about **Xcel Energy’s rebate programs**, please visit [www.xcelenergy.com/programs\\_and\\_rebates](http://www.xcelenergy.com/programs_and_rebates).