

One Business

Energy Conservation Program



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Mindy Granley, Director
UMD's Office of Sustainability

UMD Teaches Sustainability by Example

Maroon and gold may be the University of Minnesota Duluth's official colors, but the home of the UMD Bulldogs is increasingly green. UMD has long been committed to sustainability and focused on reducing its carbon footprint. Its long-term goal is to be a carbon neutral campus by 2050, and it is making significant progress every year.

Using energy more effectively is a big part of that effort, especially since 90 percent of campus carbon emissions come from heating and powering buildings. Minnesota Power's conservation improvement program (CIP) is a powerful partner in helping UMD reach its carbon reduction goals. Together, they are pursuing a three-pronged, "3-E" strategy of energy efficiency, electrification and engagement.

Campus adds buildings while cutting carbon emissions

Modern, high performance facilities are vital in today's market as colleges and universities compete for students. UMD has added several new buildings in recent years, all designed and constructed to rigorous sustainability standards such as the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system. Newer facilities include the Labovitz School of Business and Economics (2008-LEED Gold), Swenson Civil Engineering building (2010-LEED Gold) and Ianni Hall (2011-LEED Silver). The newest building on campus, the Heikkila Chemistry and Advanced Materials Science (HCAMS) building, opened in August 2019. It was built to the Minnesota B3 (Building, Benchmarks and Beyond) standards and designed to be energy efficient.

Despite adding multiple facilities and hundreds of thousands of square feet, UMD has managed to reduce total carbon emissions by 11 percent since 2007. Energy-saving renovations and equipment upgrades, increased solar energy on campus and Minnesota Power's EnergyForward efforts to green its energy

mix all have contributed to this success. Energy efficiency tops the list.

"That is quite a feat to cut carbon emissions during such a period of growth," said Mindy Granley, director of UMD's Office of Sustainability. "The building and renovation projects incorporate a lot of energy efficiency, not just in lighting but in how we move energy around campus, air conditioning, heat recovery, ventilation, timers and building systems. These choices add up, and they were all informed by our work with Minnesota Power CIP, getting advice, assistance and rebates for those projects. It is how we have gotten to where we are today."

"Energy efficiency is important to UMD for a couple of reasons. First of all, we save money for our students and for our campus," said John Sawyer, operations manager, UMD Facilities Management, adding that conservation goals make a difference. "From a project standpoint, we try to look at ways to reduce energy use and be more conscious of the budget. It also creates a good learning environment for students. Many different classes and groups come through and look at projects we have done, whether it be solar installations, LED lighting or variable frequency drives in our heating plant that runs 24 hours a day."

Minnesota Power CIP is like having energy experts on staff

Sawyer's team depends on Minnesota Power and its commercial energy consultants from Energy Insight Inc., to identify energy-saving opportunities, research costs and benefits and build the case for implementing them.

"UMD makes sure we are involved whenever there is a project with potential energy savings," said Craig Kedrowski, business services advisor for Minnesota Power and a prominent member of the CIP team. "We have worked hard to develop this relationship and high level of trust."



(Above) Variable frequency drives in UMD's Campus Utility Building adjust speed depending on cooling demand so pumps and fans do not have to run continuously at high speeds. (Right) UMD Sustainability Director Mindy Granley, Minnesota Power Business Services Advisor Craig Kedrowski, Minnesota Power CIP Consultant Tanuj Gulati, and UMD Facilities Operations Manager John Sawyer meet regularly to discuss energy efficiency.



"It is like having additional employees," Sawyer said. "They scope out projects, do the calculations and put together memos or reports that help sell projects to administration. Without the relationship with Minnesota Power, we certainly would have gotten fewer projects approved and completed."

Granley feels the same way as she works to engage the campus community in sustainability.

"My job is the connector and educator, but I can't also be the campus energy manager," Granley said. "I rely on the resources Minnesota Power provides to dig in and answer the data questions. I literally can call with a question and get an answer within a few hours. Not all sustainability directors have that strong support from their local utilities."

"It is all about communication and customer service," said Tanuj Gulati, a Minnesota Power CIP consultant with Energy Insight, Inc. "Mindy and John bring the right people to the table, and we provide data, resources and examples to demonstrate energy-saving technologies and get decision-makers on board."

Green Revolving Fund reinvests energy savings

One valuable tool is UMD's Green Revolving Fund. First proposed by a student partner, the fund was launched in 2011 with \$100,000 in seed money from Facilities Management. It is used to reinvest energy savings and conservation rebates into additional projects that save energy and reduce carbon emissions. Minnesota Power is able to provide slightly higher rebates to UMD because of this fund.

Over the years, the Green Revolving Fund has advanced numerous lighting upgrades, variable frequency drive retrofits, direct digital controls, refrigerator exchanges, renewable energy installations and other projects. Rebates and savings earned go back into the pot.

"We started with \$100,000, we've spent over \$385,000 on projects, and the balance is still around \$100,000," Granley said. "Money just keeps getting used over and over for energy efficiency."

Recently, the fund helped incorporate lighting and lighting controls into a remodel of UMD's Romano Gym.

"Lighting was not part of the original project, but money from the Green Revolving Fund helped offset the cost," Sawyer said. "It was one of the bigger projects, in the \$75,000 to \$100,000 range. Now the whole gymnasium is LED with lighting controls to conserve energy. That would not have happened without this resource."

Engaging UMD students in powerful ways

The Green Revolving Fund combined with student fees and Minnesota Power rebates also helped a student group called the SUN Delegation plan and install photovoltaic panels on Oakland Apartments. The installation is part of a 900 percent increase in solar energy on campus over the past year that also includes a 50 kW ballasted solar array on the new HCAMS building.

Paul Helstrom, a senior customer programs and services representative for Minnesota Power, helped SUN Delegation members think about real-world construction timelines and hurdles like interconnection application timelines, permitting, siting and technology considerations.

"It is always great to see young professionals in the making as they tackle real-world projects and effect real change on their campus," said Helstrom. "Minnesota Power fully supports their efforts in many capacities, from direct advice to helpful rebate funding."

As one of the region's largest employers, Minnesota Power is genuinely interested in up-and-coming talent, particularly in science and technology fields that match regional workforce needs. Minnesota Power CIP team members often speak to UMD engineering classes about the energy efficiency field, and numerous UMD students and graduates have gotten internships and jobs through those connections.

Campus-wide LED lighting on the horizon

One Minnesota Power-funded intern embedded at UMD recently completed a full campus-wide lighting inventory. It determined the value of an LED retrofit for the entire campus, a project included in UMD's capital requests for the upcoming year.

"The results were so exciting," Granley said. "Every year I ask for money for energy efficiency, often not knowing what to put it

(Right) Dan Janasz, a Minnesota Power funded intern, conducted a campus-wide lighting inventory at UMD.

(Far right) Student members of UMD's SUN Delegation worked with Minnesota Power to plan a rooftop solar array at Oakland Apartments.



toward. The lighting inventory answered that question. Having data and information helps clarify decisions and priorities. The more data we have, the better.”

The multimillion-dollar LED lighting retrofit could be completed within the next few years if full funding is approved.

Electricity will generate green future

With a natural gas heating plant that is nearing its maximum capacity, one of the strategies at UMD for expansion and renovation could be electrification. Heat pumps and variable refrigerant flow technologies use electricity efficiently to concentrate and move heat around, reducing the need for generating heat. Housing officials recently tapped Minnesota Power to study the potential for energy-saving features in a 10-story, 350-bed residence hall and dining facility that will open in 2021.

“The more we electrify campus, the better,” Granley said. “The electric utility industry is greening its energy mix. Combined with energy efficiency and on-campus solar production, that reduces our carbon footprint.”

Minnesota Power also funded a rooftop inspection of UMD housing units using a drone-mounted infrared camera to identify air leaks. While using high-tech equipment like drones and installing solar panels on rooftops generate the most interest, engaging students, faculty and the larger campus community in energy efficiency remains key to achieving UMD’s ambitious carbon reduction goals. Minnesota Power is committed to helping UMD every step of the way.

“UMD is doing great things,” Kedrowski said. “It has become a showcase for energy-effective technologies and behaviors. Minnesota Power appreciates having a large customer like UMD with passionate people on staff who are knowledgeable about smart energy use as they work to achieve their sustainability goals.”



UMD’s newest green building, HCAMS, features variable flow fume hoods with sash controls in laboratories, interior and exterior LED lighting, a plate heat recovery system, and a 50 kW rooftop solar array.

For more information:

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