

One Business

Energy Conservation Program



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David Spooner, Manager of Facilities
Duluth Public Schools

Duluth High Schools Get Top ENERGY STAR® Scores

Achievement reflects larger focus on saving energy and culture of good stewardship

Report cards are in, and Duluth's two public high schools are among the most energy-efficient learning environments in the country! Both Duluth East High School and Denfeld High School recently earned prestigious ENERGY STAR® certification with scores that place them at the top of their class.

An ENERGY STAR score provides a snapshot of a building's energy performance compared to similar facilities nationwide. It assesses physical assets, operations and occupant behaviors to calculate a percentile number ranging from 1 to 100. Facilities that score 75 or above—meaning they perform better than 75 percent of comparable buildings—may qualify for ENERGY STAR certification. Duluth East and Denfeld scored 99 and 97, respectively.

This accomplishment reflects a longtime commitment to energy efficiency that was designed and built into the Duluth Public School District's Long Range Facilities Plan and continues to this day with a focused facilities management team and support from Minnesota Power's Power of One® Business conservation improvement program (CIP).

Minnesota Power a longtime partner in conservation

Minnesota Power's CIP team has worked with the school district's facilities managers and maintenance personnel for more than 20 years, helping the district achieve its energy conservation goals and lower costs through project design assistance, energy- and cost-savings analyses, conservation rebates and other services.

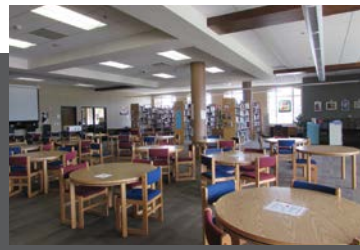
This relationship made Minnesota Power a trusted resource as Duluth Public Schools developed and implemented projects for the Long Range Facilities Plan, a \$315 million multiyear program of new school construction and facility upgrades, largely completed from 2008 to 2013. It impacted all of the district's educational sites, reduced the total number of buildings and led to more energy- and resource-efficient, 21st century school facilities district wide.

"We tried to incorporate the best available technology that we could afford to save energy, while creating school environments that were conducive to learning," said David

"ENERGY STAR® is a national program with checks and balances to validate results, including professional engineer reviews."

Craig Kedrowski, Energy Efficiency Analyst-Lead
Minnesota Power





(From left) The commons area at Denfeld High School features energy-efficient lighting and access to natural daylight; Duluth Public Schools Building Systems Coordinator Corey Karren, Manager of Facilities David Spooner, and MHTA intern Ryan Jutting; energy-efficient lighting and lighting controls in the Denfeld High School media center; Karren checks HVAC equipment.

Spooner, manager of facilities for Duluth Public Schools. "Minnesota Power was a partner in that effort."

Rebates and savings make energy-saving choices affordable

Energy-saving measures designed into Duluth East, Denfeld and other school facilities included energy-efficient lighting with lighting controls; high performance heating, ventilation and air conditioning (HVAC) systems; NEMA premium motors; variable air volume boxes; variable frequency drives; economizers; energy recovery units; and energy management systems.

Combined investments in energy efficiency made as part of the Long Range Facilities Plan qualified for more than \$394,000 in conservation rebates from Minnesota Power. Choosing these high performance technologies over standard equipment has resulted in annual energy savings of over 8,533,000 kilowatt hours (kWh) and monthly demand savings of 832 kilowatts (kW). They also have helped to significantly lower the district's cost per square foot for total energy consumption, which has gone from 90 cents in 2007 to 78 cents today. These numbers represent charges for electricity, natural gas, steam and oil, plus water, sewer and storm runoff.

Benchmarking tracks performance and calculates ENERGY STAR scores

School district facilities personnel have tracked energy costs for many years, but now monitor energy performance using B3 Benchmarking. This sophisticated online tool, recommended by Minnesota Power's CIP team, uses basic building and meter information to summarize energy consumption, costs and carbon emissions for public buildings in Minnesota.

B3 Benchmarking also calculates ENERGY STAR scores and identified Duluth East and Denfeld among 11 of 13 school buildings that potentially qualify for the prestigious certification. Lincoln Park and Ordean East middle schools narrowly missed the mark due to their indoor pools, which

require significant additional energy to heat, light and maintain through the year. All other things being equal, the middle schools are performing at levels similar to other schools built or updated through the Long Range Facilities Plan and would qualify for ENERGY STAR certification were it not for the energy demands of their pool areas.

Minnesota Power funded ENERGY STAR applications for high schools

Certifying ENERGY STAR scores requires an exhaustive review and verification process. Minnesota Power offered to fund and assist with formal applications for the two high schools. Certification of other school facilities may follow as time and district funding allows.

"ENERGY STAR is a national program with checks and balances to validate results, including professional engineer reviews," said Craig Kedrowski, energy efficiency analyst-lead, Minnesota Power, who led the utility's effort to help the Duluth Public School District certify scores for the two high schools. "People value ENERGY STAR certification because the process can't be manipulated."

"We had to input 12 months of metered utility data, both gas and electric, plus detailed information about square footage and how space is used, down to the number of computers, kitchen facilities, auditoriums, the percentage of space that is heated and cooled, and hours of regular and weekend operation," said Minnesota Power CIP commercial energy consultant Matt Haley, president of Energy Insight Inc. "Weather normalized data puts similar facilities across the country on equal footing—the Department of Energy has spent millions of dollars developing and fine-tuning these standards for use across the country."

"Certification validates the standards set for the district's Long Range Facilities Plan and demonstrates that everyone from the architects and system designers to the contractors and installers did their jobs and did them well," Spooner said. "Achieving such high ENERGY STAR scores confirms that we effectively built and are operating energy-efficient buildings."

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Recommissioning and BOC training ensure continual improvement

The school district is recommissioning buildings constructed or revitalized during the Long Range Facilities plan to make sure equipment and systems are operating as designed and meeting expectations for performance and energy efficiency. Five schools have been recommissioned to date, funded, in part, by Minnesota Power. The process is helping to identify where recent advances in lighting and other technologies could improve energy efficiency even more—laying the groundwork for future projects.

Building Operator Certification (BOC) training sponsored by Minnesota Power and hosted by the school district at Lincoln Park Middle School in summer 2016 also is helping to ensure building systems are operated properly.

“Operating all of the new equipment and systems for maximum performance and efficiency requires an understanding of building science,” Spooner said. “All of our engineers have completed BOC training, which makes them more knowledgeable about operating equipment and gives them tools to identify projects with potential to save energy.”

In the past two years, additional upgrades in lighting and lighting controls, HVAC equipment, and motors at multiple schools have qualified for more than \$27,000 in Minnesota Power rebates and brought energy savings of nearly 110 kW per month and 538,000 kWh per year.

School district taps additional resources to save energy

Meanwhile, school district facility managers regularly participate in a peer group convened by Minnesota Power which brings representatives of several large multifacility organizations together on a quarterly basis to share experiences and gain insights about energy conservation. Other members include the City of Duluth, St. Louis County, the University of Minnesota Duluth and the Minnesota Air National Guard.

This summer, Minnesota Power funded an internship through the Minnesota High Tech Association that placed an engineering student from the University of Minnesota Duluth with the Duluth Public School District. That intern, Ryan Jutting, has looked at ways to verify scheduling and settings in the district’s energy management systems and helped quantify the savings potential in sites by consolidating areas used for summer and evening programs. His internship continues through the fall.

“Duluth Public Schools are doing the right thing—they built quality schools and are maintaining those buildings to the highest standards,” Kedrowski said. “They use Minnesota Power to identify projects and look for opportunities to improve their energy efficiency. It is always refreshing to work with customers who take that kind of initiative.”

“We have limited in-house resources, so we appreciate Minnesota Power’s willingness to help us in our conservation efforts,” Spooner said. “As a public entity, it is important for us to be good stewards of taxpayer funds by using best practices and installing energy efficient equipment. Whenever I reach out to Minnesota Power, they are eager to share their expertise and resources to help us accomplish those goals.”

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For more information:

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Learn more about Power of One® Business, Minnesota Power’s commercial, agricultural and industrial energy conservation program, by calling **218-355-2909** or visiting mnpower.com/OneBusiness