

Lighting Improved in 25-year-old Gym

St. Norbert's College saves money, gains flexibility

PARTNER NEWS UPDATE

Lewis Pullen, director of facilities at the St. Norbert College sports center, had a problem. Lighting in the almost 25-year-old gym was inefficient, costly and so inadequate that the college was unable to host events such as the regional women's high school basketball tournament.

Working with US Lamp of Green Bay, and with the statewide energy efficiency program Focus on Energy, the center now has a new fluorescent system that not only has cut electricity costs in the gym by two-thirds, but gives more light, is easier to maintain and use, and provides the flexibility to control lighting depending on activities in the gym.

"I'm completely sold on the project," said Pullen. "With these improvements, our coaches and players are absolutely excited."

Pullen said Focus on Energy played an important role in support and feedback throughout the 20-month project. It also provided a grant to defray costs.

The help from Focus on Energy "was way above expectations," Pullen said.

Focus on Energy is an innovative partnership, created in 2001, to encourage energy efficiency and use of renewable energy, to enhance the environment and to ensure the future supply of energy for Wisconsin. Its services are completely voluntary and are free to eligible institutions.

MODEST INVESTMENT REAPS BIG SAVINGS

The lighting retrofit at the St. Norbert gym provides an example of how a modest investment can not only improve a facility but also save money. Over the next 15 years, after subtracting the \$70,000 in up-front costs, the new and improved lighting in the gym will save a minimum of \$104,000.

"Those savings may be conservative," Pullen noted. "Our electric rates just went up in January and we don't foresee the rates going the other direction, ever."

Nathan Nygaard, energy advisor for Focus on Energy's Schools and Local Government Program, said the improvements at St. Norbert are easily transferable

"to buildings that have large spaces, and specifically gyms. Any school gym in the state using older metal halide lighting should look into switching to a more energy efficient system. And we're here to help."

St. Norbert College, founded in 1898, is a liberal arts Catholic school in De Pere. The current gym, formally known as the Hoelt arena at the Schuldes Sports Center, opened in 1979. The 116-foot by 230-foot multi-purpose area is used for sports such as basketball, volleyball, tennis and track, as well as for commencement ceremonies by the college and area high schools, and for community events.

The gym originally used mercury vapor lighting but retrofitted to a metal halide system in the early 1980s. The metal halide system is essentially an "on-off" system that provides little control over light levels. Also, the metal halides require ten minutes or so before they reach their full light level. After they are turned off, they require a similar amount of time before they can be turned back on again. As a result, the lights were turned on in the morning and kept on until the building closed at 10 or 11 at night, regardless of whether there were any activities in the gym. Furthermore, the metal halide system had little flexibility; lighting was the same for all activities, whether tennis, volleyball or basketball, or for the senior citizens who routinely walked the perimeter track during the early morning.

Because coaches, players and community users were dissatisfied with the gym — and St. Norbert was losing the ability to host outside events — the school embarked on a number of improvements, including a new floor, new shot clocks and scoreboard, and a new lighting system.

PROGRAM ALLY INPUT

St. Norbert began working with US Lamp in the fall of November 2001 and Focus on Energy came in shortly afterwards. Before deciding on the final lighting system, US Lamp proposed about 15 different lighting possibilities, according to Randy Johnson, president of US Lamp.

"Working with the customer, we zeroed in on the system we thought would best serve their needs," Johnson said.

US Lamp did the initial designs for the new system, provided the materials and brought in an electrical contracting firm for the installation, which was completed in the summer of 2003. Focus on Energy, meanwhile, worked with US Lamp and St. Norbert to provide a non-biased second opinion on both the lighting needs and the cost and efficiency of the proposed solutions, and to help ensure the project proceeded as smoothly as possible.

"We worked with Focus On Energy, which also worked with the customer, to make sure the customer got a high efficiency lighting system with the most cost effective solution and the best performance," said Johnson of US Lamp. "That was everyone's goal."

The new system is known as a T5HO fluorescent system, which has been used in Europe for many years and was introduced into the United States in the late 1990s, according to Johnson. The T5HO differs from the T8 fluorescent technology in that it provides about 40 percent more light with the same four-foot length of fluorescent bulb. The T5HO system is especially good for facilities with a high ceiling, Johnson said.

ADDED BENEFIT: FLEXIBILITY

The new fluorescent system also allows different levels of lighting. The old metal halide system had 124 fixtures and the lights were usually kept on all day. The new system consists of 98 fixtures, with 6 lamps for each fixture. It's possible to not only control how many fixtures to turn on, but to control the number of lamps turned on in each fixture — two to provide one-third light, four to provide two-thirds light, and all six on for full light. In addition, the lights are easily turned off and on.

Because the lighting is configured for six "zones" and each zone has three different lighting levels, there are 18 different lighting configurations possible in the gym, Pullen said.

"Now, for example, we can have the basketball court on full, which you need for playing, and put the bleachers on one-third so people can see their program but they're not blinded by light," said Pullen. "The volleyball coach likes more lighting, so for those games we increase lighting to two-thirds in the bleachers. So each sport can program the lighting to their needs."

"To make it simple for the coaches, once they find out what lighting configuration they like, we put their name next to the buttons so they don't have to remember the configuration," Pullen added. "They can just push their name and get the lighting they want."

Flexibility is not the only advantage of the new system. The lighting also is better.

Lighting levels with the metal halide system were anywhere from 41 to 57 foot-candles (a standard unit for measuring illumination), depending on where you measured. "The NCAA standard is 80 foot-candles, so that was our target," Pullen said.

Johnson, of US Lamp, said the fluorescent system also provides more true color. "The new lights make the colors in the room more accurate," he said. "It's a significant improvement over the metal halide, which provides bluish white light."

With the new system, the gym's lighting costs went from about \$16,875 per year to about \$5,287 — or an annual savings of about \$11,600. After taking into account the initial costs, the project will pay for itself within six years. The new system is expected to last 15 to 20 years.

Unlike metal halide lights, which use the same amount of energy but produce less light as they age, the lumens in these bulbs do not depreciate significantly. "In a standard metal halide, that (light output) can decay more than 50 percent over the life of the bulb," Johnson explained. "In the fluorescent, the decay is only about 5 percent over the life of the bulb."

The actual wattage in the fluorescent system is not significantly lower — 458 watts per fixture in the old system, versus 310 watts per fixture in the new system, according to Focus on Energy's Nygaard. The savings come primarily from being able to better control the lighting, and the fact that there are fewer fixtures.

On an annual basis, the new system saves about 200,000-kilowatt hours a year, Nygaard said, or enough electricity for about 14 average Wisconsin homes per year.

Pullen said he is sold not only on the gym's new lighting system but also on Focus on Energy.

"I would welcome the opportunity to facilitate a demonstration of the new lighting in the arena, or respond to questions by anyone looking into such an initiative and who may be considering using Focus on Energy," Pullen said. "I bet I'm more positive about Focus on Energy than anyone else."

The Focus on Energy Schools and Local Government Program provides services to public schools, private schools, tech colleges, private colleges and universities, and to counties, cities, villages or towns served by Focus on Energy. This includes 85 percent of the schools and governments in Wisconsin. The remaining 15 percent are customers of certain municipal utilities and rural electric cooperatives that currently are not participating in Focus on Energy.