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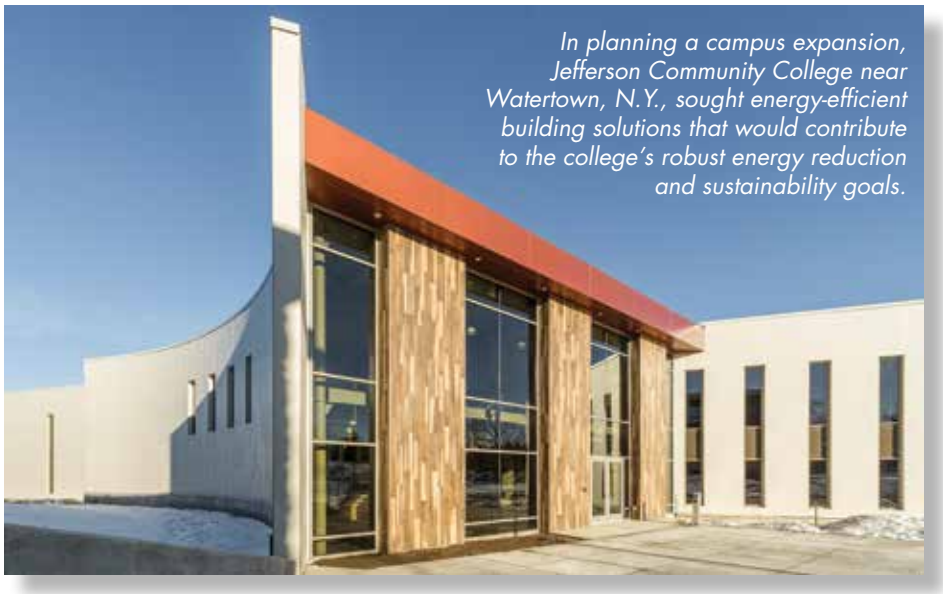

In planning a campus expansion, Jefferson Community College near Watertown, N.Y., sought energy-efficient building solutions that would contribute to the college's robust energy reduction and sustainability goals.

Installing a thermal energy storage system in the new campus learning center enabled Jefferson Community College to shift 150 kilowatts of peak energy demand to less-expensive nighttime hours.

Photo Credit (all): Trane

Jefferson Community College Makes Sustainability Part of Its Mission

By Dave Taylor

Sustainability is a core value of the Jefferson Community College (JCC) mission. Located on 37 wooded acres in northern New York State on the outskirts of Watertown, Jefferson Community College has long advocated responsibly using resources to achieve balance among economic, environmental, and social practices and policies.

As part of that mission, JCC signed the American College & University Presidents Climate Commitment (ACUPCC) in 2012 to promote campus and community awareness of global warming issues and to develop ways to mitigate their effects.

As the JCC campus underwent an expansion to address steadily growing enrollment, college leaders didn't want it to be "business as usual" regarding efficiency and carbon footprint. Instead, they wanted to improve campus facilities, add infrastructure, and keep the college's energy reduction and sustainability goals at the forefront — all while maintaining their commitment to providing high-quality programs that meet the educational needs of county residents and area employers.

The efforts have paid off. Thanks to energy-efficient solutions and a continued, determined focus on sustainability and awareness, JCC successfully expanded its campus while also saving energy and resources.

Long-Term Plan

As part of its climate commitment, JCC completed baseline greenhouse gas emissions reports that showed roughly 14 percent of the college's carbon footprint came from on-site combustion (natural gas), 15 percent came from purchased electricity and 71 percent came from student, faculty and staff commuting.

The college developed a Facilities Master Plan to serve as a guide for campus improvements during the time of growth as well as implemented a Climate Action Plan to evaluate opportunities related to their total greenhouse gas reduction, feasibility, cost and potential savings.

JCC set a target date of 2050 to reach its goal of having a net-zero carbon emissions campus. In addition, Phase I of the Climate Action Plan included a goal to reduce campus energy use by 1 percent per year. The primary targets of this effort included improving building envelopes and energy management strategies as well as reducing commuter miles through incentives and using alternative transportation.

Improving Efficiency

When the college began planning the construction of its new 37,000-square-foot John W. Deans Collaborative Learning Center, campus leaders sought assistance from Trane — a leading global provider of indoor comfort solutions and services and a brand of Ingersoll Rand — which had long been a JCC partner in campus facility and energy management projects.

The college wanted an energy-efficient solution that would provide the necessary capacity to cool the new learning center and add air conditioning to an adjacent building, without increasing operating costs. The new building would house student success services and the college library as well as quiet areas and spaces for group meetings.

JCC ultimately selected an ice-enhanced, air-cooled chiller plant for the new building. The system includes a 90-ton air-cooled scroll chiller, used in conjunction with four thermal energy storage tanks. By using a thermal storage plant, the school leverages HVAC equipment and advanced building controls in a whole-building design that helps optimize performance and efficiency.

Thermal storage also allows JCC to shift electrical consumption to off-peak nighttime hours to control peak demand, resulting in significantly lower utility bills. Ice generated overnight, when energy demand and costs are lowest, is stored and then used to cool the building during the day. Using a chiller plant control application, school facility managers can monitor equipment and decide whether to melt, make or preserve ice to enable efficient cooling.

In addition to the thermal storage system, JCC also installed sub-metering to obtain detailed energy data, a high-efficiency boiler and direct digital controls that allow more efficient management of building systems. The sub-metering is especially critical in helping JCC

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To LEED or Not to LEED

By David Sturtz

There is more than one pathway to energy-efficiency and green technology. One of the most common pathways for builders and architects is LEED certification. The USGBC, a nonprofit organization that promotes sustainability in building design, unveiled the LEED certification program in 2000 to guide the design, construction, operation and maintenance of a new or renovated building toward sustainability.

Sturtz

LEED certification has become the primary indicator of energy and efficiency in civic consciousness. No one knows this better than a school district gearing up for renovation or new construction. Communities want their districts to be mindful of the environment, and they're likely to advocate for LEED certification.

School districts are also mindful of the environment, but they must justify return on investment. Working with local design professionals to determine the pros and cons of LEED certification supplies districts with information and data they can share with their communities.

If the decision is to certify, documentation should begin immediately to keep track of design decisions, quantities and forms required for certification. Beginning this process early affords time to integrate sustainability strategies efficiently.

If a district decides LEED certification doesn't provide the financial justification for the effort and cost involved, there are alternative pathways toward increased energy-efficiency and sustainability. To its credit, LEED certification has sparked important conversations about energy efficiency and sustainability. For example, the goal is energy efficiency, but what kind of energy?

There is conflicting research regarding site, source and total energy savings in LEED-certified buildings. That's because energy savings at the site level (school building) is easier to attain than energy savings at the source.

Site energy is how much energy a building uses — also what users see on a power bill.

Source energy is how much raw material is required to generate, store and transfer power from a power station to a site.

Source energy is how much raw material is required to generate, store and transfer power from a power station to a site.

Site energy is defined by how much energy a building uses, or what ends up on a power bill.

Total Energy

Site-to-source ratio is how many units of energy are used compared to how many units of energy are required to make energy at the source. A one to one ratio means there was no loss of energy between the creation of the power and its storage, transmission and use.

Sustainability is a journey, and regardless of whether a district takes the LEED pathway or a different one, journeys are always based on sound planning. Together, districts and communities can plan for sustainability both environmentally and economically.

David Sturtz is a project director for DeJONG-RICHTER, one of the leading school facility planning firms in the United States. On Jan. 1, 2017, DeJONG-RICHTER merged with Cooperative Strategies, an educational consulting firm headquartered in Irvine, Calif. The combined firms operate under the Cooperative Strategies' name. Contact Sturtz at dsturtz@dejongrichter.com.

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see detailed information about how and where energy is being used on campus.

With a building automation system (BAS) controller to manage the system, building operators gain ease of use and the ability to monitor performance and make changes remotely with a web-enabled device. With the click of a button, facility managers can make set-point changes and manage alarms. The system's dashboard screens allow for simple reporting and programming adjustments to help ensure building systems continue to perform as they should.

Money-Saving Results

Installing a thermal energy storage system in the new learning center enabled JCC to shift 150 kilowatts of peak energy demand to less expensive nighttime hours. This helped the college reduce energy costs by taking advantage of lower-cost, off-peak electricity, while also managing peak demand to help reduce strain on the power grid.

The system is also an educational investment opportunity for the college. The new chiller plant, located in the center of the 12-building campus, includes signage and information about the sustainability benefits of thermal energy solutions.

Progress

The project has helped JCC make progress toward its goals of improving campus facilities and infrastructure while focusing on energy reduction and sustainability. It's a mission requiring an ongoing commitment, strategic investments, and assessment of new opportunities and technologies.

"We are building momentum as we work toward our ACUPCC goals," said Bruce Alexander, facilities director for JCC. "As we continue to implement energy-efficiency improvements, we are also increasing environmental awareness among our students, and the success of one project is making it easier to get approval for the next one."

College leaders hope the Climate Action Plan will help guide the campus now and into the future as they work to become climate-neutral and provide further stewardship for sustainability.

Dave Taylor, LEED AP, is an energy engineer at Trane, with a U.S. headquarters in Davidson, N.C.

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collecting, correlating and analyzing. Any red flags could trigger alerts to be sent to the appropriate individuals for follow up and any necessary corrective actions. In many cases, predictive analysis can identify and isolate potential problems early enough to enable immediate action that can significantly mitigate an event or even prevent it from occurring in the first place. As an added benefit, predictive analysis solutions are capable of learning and improving over time, meaning they are often capable of identifying patterns that may never have been expected and most likely wouldn't have been uncovered without that level of contextual analysis.

By reducing the time, cost and potential for errors associated with manual processes and credentialing, PIAM solutions deliver improved security, enhanced situational awareness, greater efficiency and the ability to proactively identify potential risks. This combination makes PIAM solutions an ideal tool for allowing schools at all levels to overcome the many security challenges they face today while retaining the spirit of openness they embody.

Don Campbell is the vice president, product, at Quantum Secure of San Jose, Calif.