SSL

Felipe Leon

## **A Model of Efficiency** Thirteen 'Exemplary Partners' recognized for advanced controls

Today's leading-edge lighting systems can communicate with other building systems to enable substantial energy savings while collecting valuable insights about building operations. But less than 1% of lighting systems are currently connected and working to tap the potential of these savings. The U.S. Department of Energy Better Buildings Initiative sought to improve the uptake of advanced lighting system capabilities by launching the Integrated Lighting Campaign (ILC) in June 2020. The ILC recognizes exemplary projects and helps facility owners, operators and managers learn about—and consider installing—high-efficiency lighting and control systems that are integrated with other building systems for added efficiency and performance. The ILC's organizing partners (including the DesignLights Consortium, Illuminating Engineering Society, interNational Association of Lighting Management Companies, International Facility Management Association, Lighting Controls Association and U.S. General Services Administration, in addition to Better Buildings) hope to leverage the campaign to take lighting to the next level; in fact, to take lighting where it has never gone before.

Advances in both lighting systems and controls are of interest to the ILC if they work synergistically toward whole-building energy savings. This could mean using sensors to control lighting based on occupancy and existing daylight in a space, exchanging information between the lighting and HVAC systems, or integrating the lighting system with plug loads. Non-energy benefits can be powerful as well and allow building operators to tap into a much higher value proposition that includes space utilization analysis by leveraging the occupancy sensors already installed in a lighting system. For systems with communication beacons, real-time indoor positioning (e.g., people/asset tracking) might help improve business workflows.

The ILC provides resources, guidance and technical advice to those attempting to achieve energy savings and other building goals through the innovative lighting systems described above. The ILC then documents lighting projects that stand at the forefront of innovation and recognizes exemplary projects, highlighting their successes so building owners and specifiers can see lighting in new ways and make informed decisions about connected systems and their capabilities.

**The ILC has wrapped up its** first year with recognition of 13 "Exemplary Partners" for their use of advanced lighting sensors and controls and the integration of lighting systems with other building and business systems. The innovation demonstrated in these projects has netted a notable return, including a reduction in energy use, increased occupant comfort, the collection of useful data to support business decisions, streamlined and reduced maintenance efforts, and other important impacts.

> "The goal was to use sensors in the luminaires to make both lighting and HVAC occupancy based

Among those recognized is Bryan Health, a Midwest nonprofit health-care organization. Bryan Health saw in a scheduled remodel of its East and West campus locations in Nebraska an opportunity to leverage the latest LED and controls technologies. In addition to replacing all fluorescent luminaires with LEDs, goals of the project included personalized task lighting, dimmability, energy efficiency and cloud-based centralization of lighting system data.

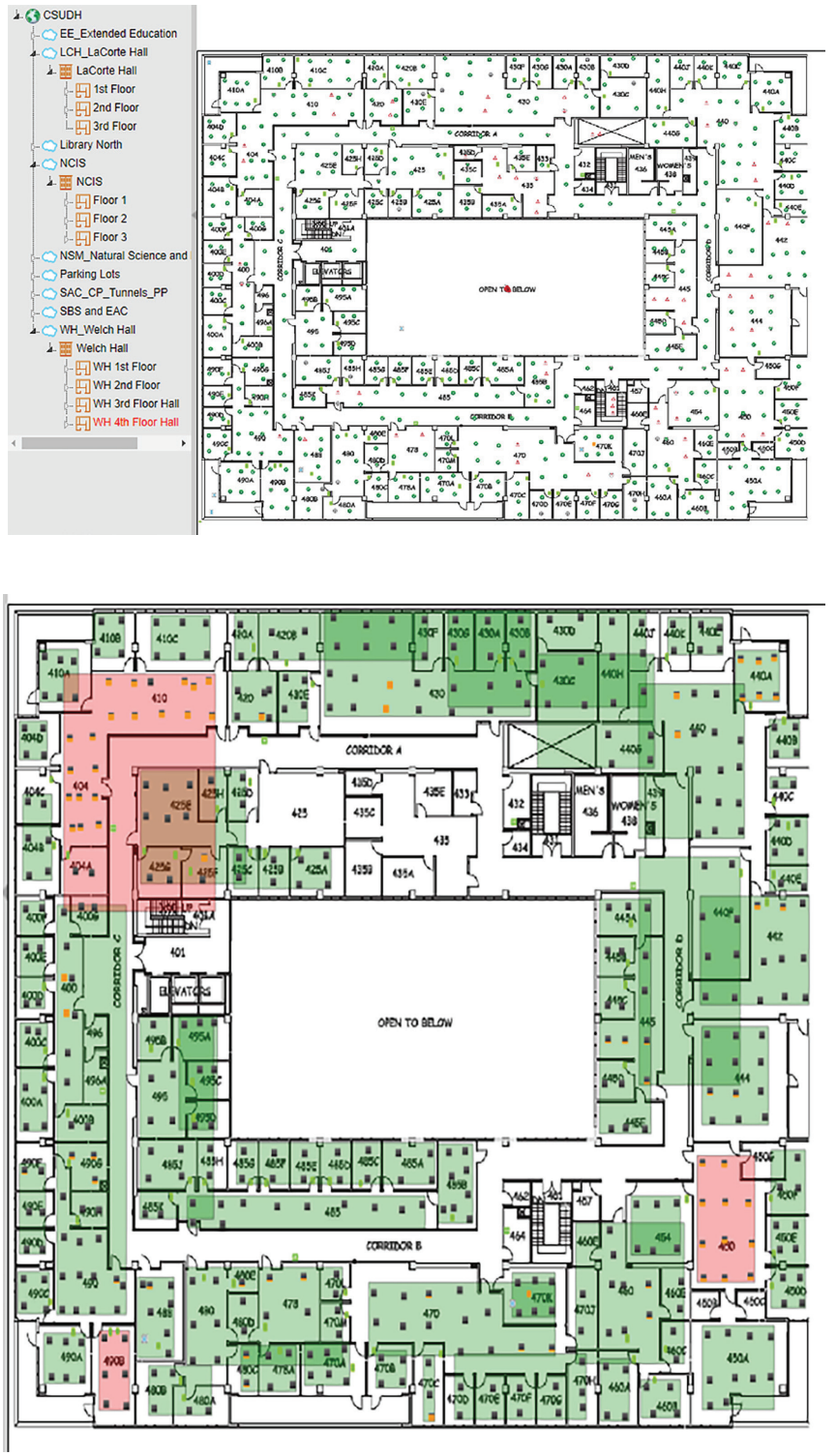
Bryan Health chose a lighting management system with advanced controls, an intuitive dashboard and intelligent data visualization to operate lighting remotely and present a bird's eye view of performance, use and occupancy in real time across both campus locations. Occupancy sensors and programmable lighting scenes proved to be key elements in the lighting design. To date the

payoff has been a 57% reduction in lighting energy use, increased workplace satisfaction and comfort for staff as they set their own light levels, faster facilities team response times to address general lighting issues and an improved process for patient diagnostics thanks to preset lighting scenes in X-ray rooms.

Mike Wiruth, master electrician at Bryan Health, recommends to other facility managers that they implement a system that can be easily scaled to changing needs and also advises that a key stakeholder take ownership and receive thorough training on the system to know it “inside and out.”

Another organization recognized by ILC, California State University - Dominguez Hills, has long been an early adopter of energy-saving lighting technologies. CSUDH chose advanced sensors and controls for a recent lighting upgrade in its James L. Welch Hall that totals about 180,000 sq ft of space over four floors. Luminaire-level sensors with occupancy, photosensing, temperature logging and Bluetooth capabilities tied into the automation system and HVAC—the goal being to use sensors in the luminaires to make both lighting and HVAC occupancy based. Data produced by the system would be so granular that occupants of individual offices could control both light levels and HVAC for maximum comfort.

Results achieved to date at CSUDH align with the vision




The dashboard image (top) shows the granularity of lighting controls on the fourth floor of Welch Hall at California State University – Dominguez Hills. The bottom image shows lighting zones that match VAV zones, offering granular control of HVAC.

of the ILC—lighting that goes beyond traditional boundaries to achieve so much more in terms of energy savings as well as human comfort and well-being. Energy savings from lighting in Welch Hall have been 34% and from HVAC 27%. Especially in the pandemic era of reduced occupancy, tying the sensors into HVAC proved critical. "When we have these large four-story buildings that have six people on one floor, without this technology we would be cooling that entire floor to 72 deg," says Kenny Seeton, central plant manager and energy manager at CSUDH. While occupants can control their own light levels but not HVAC, Seeton added, "Now we're able to just cool the spaces that people are in." Because of such powerful returns for a lighting system integrated with HVAC, he urges building owners and facility managers to be forward-looking and implement only a connected lighting system with these capabilities.

In addition to Bryan Health and CSUDH, other organizations recognized by the ILC for exemplary projects include the City of Wilmington, IMEG Corp., the Massachusetts Port Authority and Westover Reserve Air Base in the category of Advanced Use of Sensors and Controls for Lighting; Denver Water, the Minnesota Department of Transportation, the State of Vermont, the U.S. Office of Personnel Management and the University of Minnesota for Integrated Controls for HVAC and Lighting Systems; Johnson Controls Headquarters for Integrated Controls for Plug Loads and Lighting Systems; and the Walgreen Company for Other Integrated Systems and Lighting.

The ILC's second year was launched in early January and includes new recognition categories as well as an emphasis on identifying projects in underserved communities. Organizations interested in shining the spotlight on their connected lighting projects can learn more by visiting the Integrated Lighting Campaign website.

Felipe Leon is a lighting engineer at Pacific Northwest National Laboratory (PNNL) where he serves as Integrated Lighting Campaign lead. Since joining PNNL in 2014, he has also supported OLED and flicker-related research.