UC San Diego
UC San Diego News Center

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University Retrofits Thousands of Additional Lights, Saving $210,000 Annually

UC San Diego recently completed a $1.5 million lighting-retrofit project that has reduced electricity costs by $210,000 per year in campus offices, classrooms and meeting rooms, warehouses and other areas. The university also is planning to complete in 2012 two additional lighting-retrofit projects, one in parking lots and another at its Recreation, IntraMural Athletics Complex (RIMAC), with combined estimated annual savings of $90,000.

To help pay for the $1.5 million project, the university received a $650,000 ratepayer-funded incentive from the University of California/California State University/Investor-Owned Utility Energy Efficiency Partnership administered in part by San Diego Gas & Electric Co.
The $1.5-million lighting effort is part of a $73-million partnership project at UC San Diego to increase the energy efficiency of 25 older buildings to lower the cost of their combined energy consumption by at least $6 million a year. The project is part of a larger $247.4 million University of California initiative through the partnership to reduce greenhouse-gas emissions and cut energy costs at its 10 campuses by $36 million annually. The goal is to reduce energy use of the UC system to 2000 levels by 2014.

“During this time of unprecedented state budget cuts to higher education, our energy-saving projects are helping to significantly reduce our base operational costs,” said Gary C. Matthews, vice chancellor of Resource Management and Planning at UC San Diego. “Energy efficiency also is one of the easiest ways to make progress toward our loftiest goal of redesigning the campus to be climate neutral by 2025.”
UC San Diego’s Facilities Management engineers found that some areas on campus are over-lit. In libraries and warehouses that had wall-to-wall rows of ceiling-light fixtures, the engineers removed every other fixture or replaced 8-foot fixtures with 4-foot fixtures while preserving recommended lighting levels.

“Lighting accounts for about 25 percent of the energy use in a home, but at UC San Diego, where we have other major air conditioning and ventilation loads, it accounts for about 10 to 15 percent of our total electricity use,” said John Dilliott, campus energy manager. “Because the

electricity used for lighting accounts for such a significant piece of our total usage, we're doing all we can to lower those operating costs."
Here are a few highlights of the $1.5 million lighting project:

Replaced 40,000 fluorescent lights: 34-watt lamps were replaced with more efficient 25-watt fluorescents that deliver the same amount of light. More energy-efficient ballasts were also added.

Safety codes stipulate that stairwell lights must be on at all times, but 324 stairwell fixtures in 18 campus buildings were switched to two-fluorescent-lamp fixtures equipped with occupancy sensors. One lamp in each fixture is always on, and the second is activated by nearby motion. Electricity consumption by stairwell lights was cut in half.

A large, off-campus warehouse facility used to store library books and other materials and supplies was found to be over-lit with wall-to-wall ceiling lights. The existing 8-foot fixtures more energy efficient 4-foot fixtures and more energy-efficient ballasts, while maintaining sufficient light levels.

"We took the recommendation of UC Davis's California Lighting Technology Center and installed stairwell fixtures that operate at a reduced, standby-light level and instantly increase to full light output when occupancy is detected by a motion sensor," said Anna Levitt, UC San Diego's assistant energy manager. "Saving energy on stairwell lighting can be applied to all UC campuses to achieve significant system-wide energy savings."
In addition to the project that resulted in a $210,000-per-year electricity savings in campus teaching and laboratory buildings, additional lighting retrofits also were made at the Price Center, the bustling hub of campus life, providing students, and the campus community, with spaces to eat, shop, play, relax, meet, and belong. Lower-wattage light fixtures equipped with occupancy sensors in the center's West Ballroom alone have resulted in a $5,000-per-year savings in electricity costs.

In campus parking lots, light fixtures with single 220-watt low-pressure sodium lamps were replaced by fixtures with an equally bright pair of 54-watt fluorescent bulbs and a motion sensor. During hours of darkness, one light in each fixture is remains on, and when a pedestrian or moving vehicle is detected, the second bulb in the fixture lights up. About 800 parking-lot lights have been retrofitted this way.
Also, UC San Diego Student Affairs is planning to cut lighting costs significantly at RIMAC by

switching to more efficient, lower-wattage lights that automatically dim or shut off when illuminated areas are not in use. The new lights and controls are going into meeting rooms, racquetball courts and the 5,000-seat arena.

“Our lighting bill will drop about $60,000 per year when the project is completed,” said Don Chadwick, director of Facilities Planning and Management for the university’s Student Affairs facilities. “The retrofits will also qualify for an incentive rebate under the state-wide incentive program.”
University engineers and facilities managers have found that not only are they able to save money with the lighting retrofits, but the quality of room illumination has increased with “smart lighting” technologies.

For example, the main sports arena in RIMAC currently has 72 metal-halide lights rated at 1,000 watts each. Those lights will be replaced with 144 metal-halide fixtures rated at 320 watts each. Although total wattage was reduced, the new lights will actually provide better illumination for the basketball and volleyball players, coaches, referees and spectators below.
“Not only will we get better floor-level illumination with lower wattage bulbs, but we will also be able to program the lights to dim to predetermined levels during lectures, concerts or other events. It amounts to a new capability to deliver the most appropriate lighting ‘scene’ needed.”

Chadwick said the new lights will also have a longer lifespan, reducing replacement and maintenance costs further. “RIMAC’s electricity bills are paid with student fees, and we wanted to make the cost-cutting retrofits as soon as possible.”

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