

UC Berkeley to develop wireless lighting controls

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Building science researchers at the University of California, Berkeley, have received a grant from the California Energy Commission to develop a flexible, low-cost lighting control system that could provide commercial building owners with significant energy savings and more satisfied tenants.

The research team, based at the campus's Center for the Built Environment (CBE), will construct the system using miniature, low-power radio technology being developed at UC Berkeley.

Because lighting energy accounts for nearly 50 percent of electricity use in commercial buildings, the new wireless system holds great potential for energy savings. In many buildings, lights are left on unnecessarily because of inadequate controls. Traditional switches are typically expensive to install, inflexible, and generally unable to respond to available daylight or occupancy.

By building the new system using a wireless network instead of traditional wiring, CBE's research team aims to greatly reduce installation costs for the new system, and to allow for cost-effective retrofits in existing buildings.

According to CBE Research Specialist Charlie Huizenga, the cost of installing today's wired switches is approximately \$150 to \$200 per switch. "Improvements in wireless technology will make our system cost effective for many applications. We estimate that within a few years, the

installed cost of our wireless devices could be as low as \$25 per device," he said.

Unlike lighting control systems now available, CBE's proposed system will be compatible with a wide variety of existing light fixtures, lamps and ballasts. In

pilot installations, CBE has installed light controllers in a matter of minutes.

Huizenga said that the new system will have advanced features that enable building occupants to control lighting to suit their individual preferences.

"In rooms or areas of a building with adequate daylight, lights could be turned off manually by occupants, or automatically with daylight sensors," he said. "In large open offices, lights could be controlled above individual workspaces. This will allow us to avoid the common scenario in which you have an enormous office area with all the lights blazing, when there are only a handful of people actually working in the space."

The wireless system will provide flexibility by allowing a single switch to control a variety of lights. Switches will be designed so that they may be easily reprogrammed when workers move to new locations, or when office layouts change.

Previous research conducted by CBE and other groups has shown that building occupants who have some element of control of their workspaces are generally more satisfied than occupants with no control.

Another important application of the new lighting control technology would come during periods of peak electrical demand. CBE's proposed system could automatically eliminate 50 percent or more of the lighting load in many buildings during peak times, without compromising health

and safety.

CBE's \$75,000 grant comes through the Energy Innovations Small Grant Program, part of the California Energy Commission's Public Interest Energy Research (PIER) program.

The small grants programs are aimed at small businesses, academic institutions and non-profit organizations that would not normally qualify for PIER funding. The objective of PIER is to provide seed funding for small but innovative projects that will reduce the cost of producing electricity, save energy and improve the environment.

CBE may seek more funding from its industry partners to take its prototype to the next level, said Huizenga, noting intense interest from leading building industry firms and organizations that follow and support the center's work to improve the performance of non-residential buildings.

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