CALIFORNIA LIGHTING TECHNOLOGY CENTER

CELEBRATING A DECADE OF *INNOVATION*

IES tour of the CLTC Daylighting Lab, 2013

A Letter from the Directors

The California Lighting Technology Center (CLTC) was created in 2003 to accelerate technology transfer from the laboratory to the marketplace by fostering collaboration among lighting and energy stakeholders. The center was founded at the University of California, Davis, with support from the California Energy Commission, California utilities, the U.S. Department of Energy, and the National Electrical Manufacturers Association.

Now part of the Department of Design at UC Davis, CLTC remains dedicated to fostering innovation, accelerating the development and commercialization of energy-efficient lighting and daylighting technologies, and seeing quality products succeed on the market. We conduct applied research and development aimed at producing innovative technologies.

CLTC construction, 2003

Smart Schools Symposium, 2013

LED luminaire design class, 2011

Corridor demo, 2010

Our work is guided by multiple partners, including manufacturers, utilities and large building owners. As new technologies emerge from the laboratory, they are brought to the market through coordinated demonstration, education, training, and policy activities.

Over the years CLTC has facilitated the development of multiple emerging technologies. These include sources for solid-state lighting (SSL) and adaptive lighting controls that automatically optimize comfort during occupied times and energy efficiency during unoccupied periods.

Our extensive technology demonstration portfolio has been developed with feedback from all affected stakeholders. It has encouraged technology adoption in different sectors by demonstrating the benefits of new strategies and new technologies.

After a decade of working with manufacturing companies, nonprofits, utilities, energy regulators, academics, and builders, CLTC is better equipped than ever to impact lighting efficiency and quality. We are now reaching beyond California, to the rest of the nation and the world.

We are grateful to all past and present CLTC staff and partners for their trust, support and hard work.

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KONSTANTINOS PAPAMICHAEL
Director, CLTC
Professor, UC Davis

UC/CSU/IOU partnership meeting, 2006

Daylight harvesting, 2008

Integrating sphere, 2006

South Entry Parking Structure, 2009

A History of Excellence

CLTC was founded at the start of the solid-state lighting (SSL) revolution, and the center played a vital role in developing and commercializing LED lighting products.

The center conducted numerous demonstrations that proved the technology's energy efficiency and market viability. CLTC showcased SSL's potential to increase comfort, well-being and health with color tuning controls.

In addition to prototyping, product development and demonstrations, the center conducts research and independent product testing, providing reliable data on the state of the lighting market.

Advancing Efficiency

Adaptive lighting is one of the most effective strategies for increasing the energy efficiency of lighting in a variety of applications, both indoors and out. Advanced control systems developed at CLTC automatically reduce energy use for electric lighting when sufficient daylight is available, areas are vacant, or lighting loads need to be shed in response to peak demand events. This tailored approach to lighting drastically reduces energy waste without compromising lighting quality or occupants' safety and security.

CLTC researchers have identified adaptive lighting applications that yield deep energy savings, and they have conducted RD&D projects that improve the reliability and function of photosensors, occupancy sensors,

LED directional lamp testing, 2013

North Entry Parking Structure, 2009

Rosenfeld Chair in Energy Efficiency, 2012

Office lighting, 2012

demand response controls, network communications, and building energy management systems.

CLTC has carried out numerous demonstrations of adaptive lighting, sharing results in case studies, articles in trade publications, training courses, presentations, seminars, and outreach campaigns. The vast majority of these demonstrations were made possible through the Energy Commission's State Partnership for Energy Efficient Demonstrations (SPEED) program and with support from utility partners, manufacturers and host sites, including UC and CSU campuses. UC Davis has been one of our most enthusiastic allies in this effort, leading early adopters in the movement to embrace effective new technologies.

Bringing Daylight Indoors

CLTC has long championed daylight harvesting, starting with electric lighting controls and expanding to work with controls for windows and skylights. CLTC researchers hold patents on several photosensing controls for electric lighting, including the dual-loop photosensor for skylight applications. This breakthrough significantly increases the reliability and cost-effectiveness of daylight harvesting, compared to traditional single-sensor approaches, and it is now commercially available.

The center has also collaborated with other researchers to demonstrate tubular daylighting devices (TDDs) and core sunlighting systems that supplement daylighting with LED lighting and deliver the benefits of daylight to building

Corridor controls, 2010

Street Lighting Workshop, 2012

Evolution of OLEDs, 2012

Smart Lighting Initiative, 2012

CLTC prototype lab, 2011

spaces that lack skylights or windows. CLTC is now completing a Daylight Harvesting Lab designed to produce the next generation of integrated, "ultra-smart" windows and luminaires.

The center is also developing advanced treatments and controls for windows and skylights to manage daylight penetration for improved comfort and energy efficiency. Finally, CLTC is collaborating with UC Davis's Western Cooling Efficiency Center to integrate controls for lighting, windows and skylights with those for heating, ventilation and air conditioning (HVAC). This advancement promises to optimize overall building comfort and energy efficiency.

Improving Standards

Beyond the lab, experts at CLTC have provided support to state and national policy makers as they update codes and standards to reflect new technology developments. Together, we have helped make adaptive lighting the new standard in California buildings. We have proven the viability of higher efficacy and quality standards for lighting, and we have supported updates to requirements for fenestration and daylight harvesting technologies.

Building on success after success over the last ten years, the center has grown significantly, along with its network of affiliates and project partners. Together we have achieved many of CLTC's original goals, and have continued to set new, more ambitious goals in keeping pace with the lighting industry's rapid progress.

Collaboration remains at the core of CLTC's success, and this is an exciting time to be in the lighting field. Join us in undertaking new projects and forging new partnerships. Contact CLTC today to renew your affiliate support, inquire about becoming a CLTC affiliate, or partner with us on a research project.

For more information about CLTC research, demonstration, education, and events visit ***cltc.ucdavis.edu****.*

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