



Next Generation LED Lighting for General Illumination

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UC Davis

Founding Organizations



California Energy Commission



University of California, Davis



National Electrical Manufacturers Association



US Department of Energy

PIER Model



PIER PROGRAM RESEARCH AND DEVELOPMENT SYSTEM

FINDING MARKET-BASED SOLUTIONS WITH MANUFACTURERS • BUILDING PARTNERSHIPS FOR DEMONSTRATIONS
INTEGRATING FEEDBACK FOR PRODUCT IMPROVEMENT • CREATING A RAPID, ECONOMIC PATH TO MARKET

RESEARCH

- Assesses project objectives
- Tests and evaluates energy efficient technologies
- Partners with manufacturers
- Builds solutions for the public

DEMONSTRATION

- Provides initial installations
- Validates onsite performance
- Creates confidence and receives feedback
- Broadens technology use

MARKETPLACE

- Provides emerging technologies and incentives for utilities
- Creates early adoption momentum for other businesses and market success
- Stimulates suppliers to provide additional distribution of technology
- Increases technology adoption and public benefits

RESEARCH POWERS THE FUTURE OF ENERGY EFFICIENCY



ENERGY.CA.GOV

FOUNDING ORGANIZATIONS



CA UTILITIES



MANUFACTURERS

LARGE END USERS



CLTC Mission

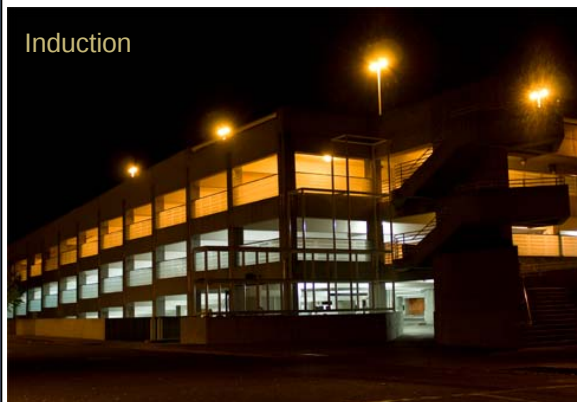
- **To stimulate, facilitate & accelerate the development, application & commercialization of energy-efficient lighting and daylighting technologies in partnership with utilities, manufacturers, end users, builders, designers, researchers, academicians, and governmental agencies.**
- **Activities**
 - **Research & Development**
 - **Demonstration & Outreach**
 - **Education & Training**

Bi-level Smart Lighting

- Occ. sensors + high/low mode controls
- Demonstrated 50- 70 % savings
- Demonstrations at California State University, Sacramento (SMUD Partnership) & UC Davis
- Campus-wide retrofit at UC Davis (PG&E Partnership)
- Wide Spread Adoption Through Out California



Bi-level Smart LED Bollard



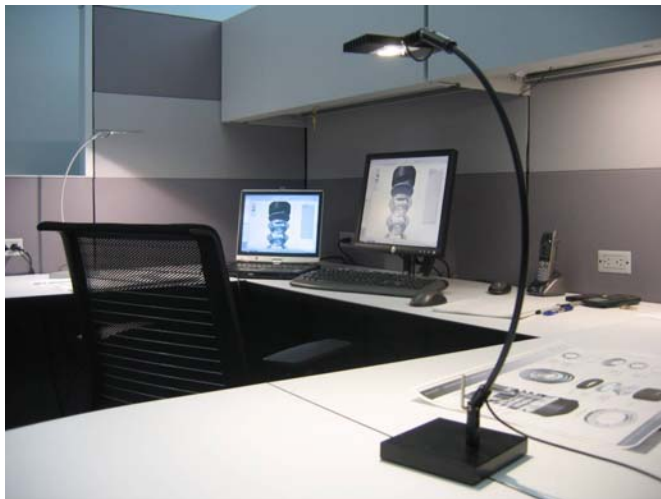
LED parking lighting at UC Davis

- Fixture: BETA Led
- Before: 175 W metal halide
- After: 115 W in high mode and 35 W in low mode
- Can set sensor from 30 seconds – 30 minutes
- Savings up to 80 %



Personal Lighting System (PLS)

- Integrated Office Lighting System
- 0.5 – 0.6 watts/sq ft with low ambient lighting
- Low glare
- Increased user control
- Increased lighting quality
- Occupancy sensing



LCF
LIGHTING
CALIFORNIA'S FUTURE

Flex
your
POWER

LIGHTING
for
tomorrow

Interior LED Lighting

■ Cooper HALO LED Downlight

➤ First ENERGY STAR approved

■ Advanced LED Downlight

■ Hunter LED Ceiling Fan



Progress Lighting Decorative LED Fixture



Cooper LED Downlight



Advanced LED Downlights



Hunter LED Ceiling Fan

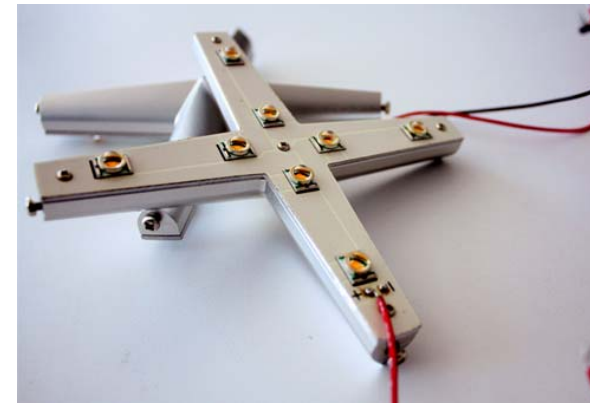
Cooper Halo LED Downlight

- First LED downlight to be Energy Star approved
- Cooper Halo: Dimmable LEDs are integrated into a recessed downlight to achieve an overall system that has a high overall lumen output while providing continuous dimming control at low output levels
- On the market now



Advanced LED Downlight

- Indirect optical design reduces LED glare, decreases installation time, and improves thermal management
- Efficient centralized power supply
- Dimmability, occupancy controllable, demand response
- Low-voltage, cat-5 cable connect up to 10 lights on 1 power supply



LED Ceiling Fan

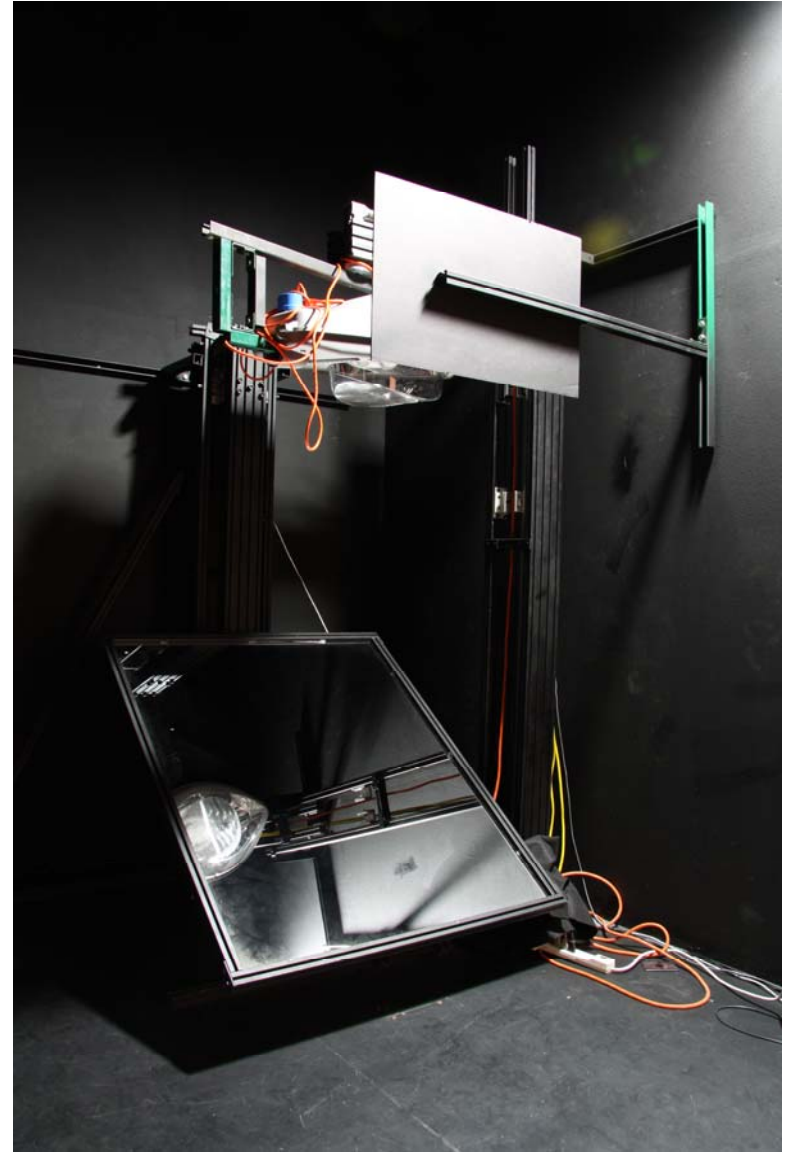
- LED-based lighting retrofit kits for ceiling fans
- Prototype in development CLTC with Hunter Fan
- 70 % energy savings compared to 120W incandescent



Laboratory Equipment

■ Gonio-Photometer

- Photopic Detector
- Spectral Detector



Laboratory Equipment

■ Integrating Spheres

- 2 M Diameter
- Internal Ambient Temperature Thermally Controlled
- 4 Pi and 2 Pi Geometry



Laboratory Equipment

■ LED Laboratory

- Board Router
- Re-flow Oven
- Small Integrating Sphere



Laboratory Equipment

■ Prototype Shop

- Machining tools
- Hand Tools

