



University of California, Davis

CLTC
CALIFORNIA LIGHTING TECHNOLOGY CENTER

Developing & Commercializing Advanced Lighting Technologies Thru Collaborative R&D

ASERTTI Forum
February 7, 2006

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Presentation Overview

Research Process

Research Results



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CLTC Established in Early '04

- Partnership between California Energy Commission PIER Program and UC Davis
- Support from NEMA and DOE
- Build on earlier success at LBNL



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California's PIER Program

Public Interest Energy Research

- PIER program implemented in 1998 as a part of electric industry restructuring
- Up to \$62 Million per year for electricity related research
 - ... nominally \$10M/yr for buildings
- Mandate to provide benefits back to the CA electricity ratepayers

www.energy.ca.gov/pier

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CLTC Construction—Nov '03

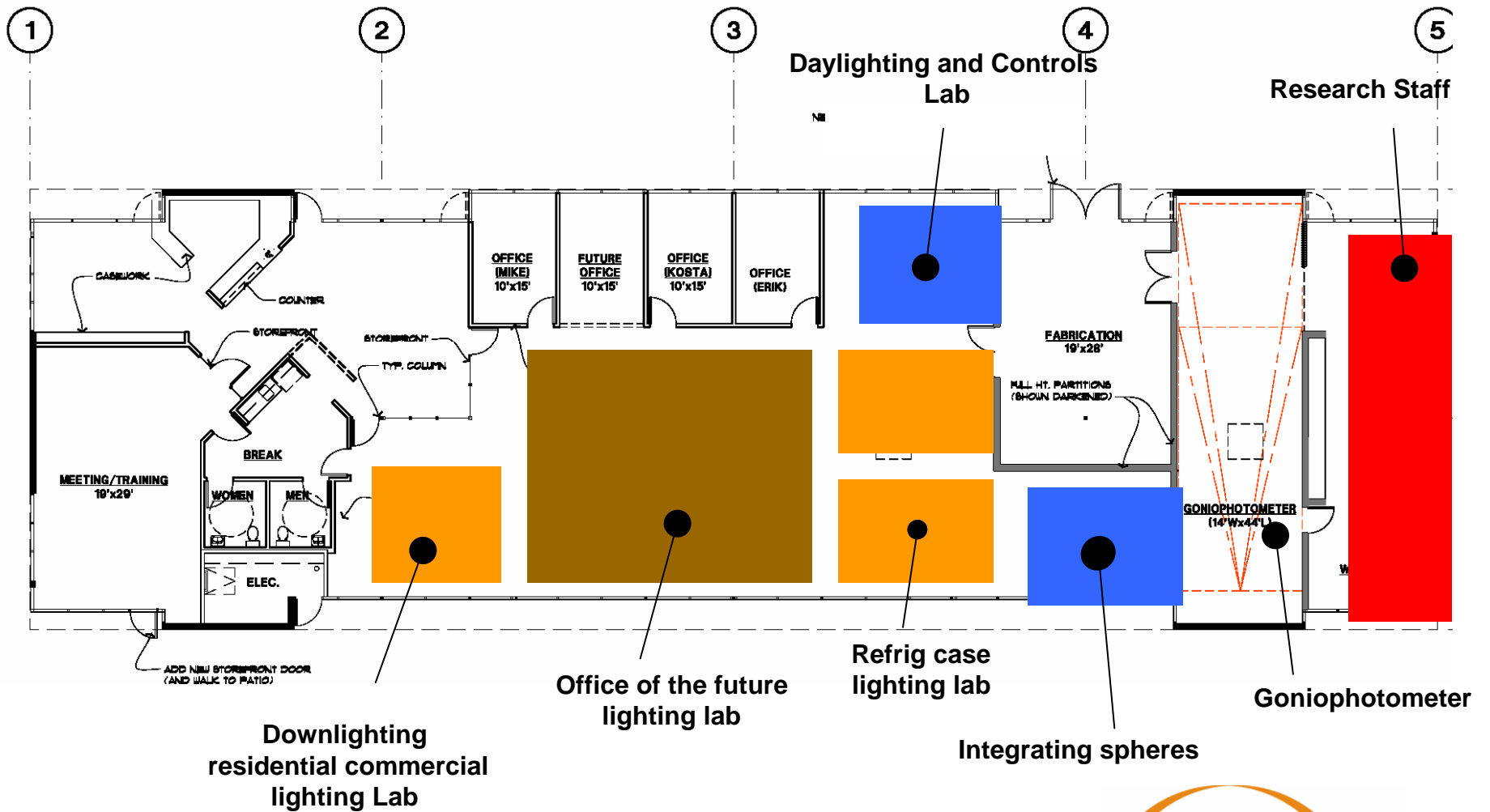


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Floor Plan—7000 sq. ft.



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Industry Link—Lobby Recognition



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Industry Link—Advisory Council

Co-founding Institutions

- California Energy Commission
- UC Davis

Utilities

- Sacramento Municipal Utility District
- Southern California Edison
- Pacific Gas & Electric Company
- Southern California Gas Company

Industry

- NEMA
- Acuity Lighting Group, Inc.
- Osram Sylvania
- The Watt Stopper
- Building Industry Research Alliance

Government

- California Energy Commission
- U.S. Department of Energy

Public Interest

- Natural Resources Defense Council

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Industry Link—Project Partners

Public agencies

Utilities

Fixture manufacturers

Lamp manufacturers

Controls manufacturers

Industry Groups

- CEC
- PG&E
- SCE
- SMUD
- Advance Ballast
- Osram Sylvania
- Finelite
- Lithonia
- Sportlite
- Hunter Lighting
- Day-Brite
- Wattstopper
- Leviton
- NEMA
- ConSol
- NRDC

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Laboratory to Marketplace

A Comprehensive Process

Approach

... before and during projects

- Manufacturer partnership
- Utility demonstration
- End-user participation & buy-in
- Link to utility rebate programs
- Link to state energy codes

Result

- Reduced risk to manufacturer
- Reduced cost to commercialize
- Commercialization more likely
- Faster market adoption
- Deeper market penetration
- Product more likely to be successful

Research Results

Highlighted Products

- Integrated classroom lighting system (ICLS)
- “Smart” bathroom lighting
- Residential CFL downlights
- Hybrid LED exterior lighting



Plus

- Other products available now
- Products coming soon
- Upcoming projects
- Increased outreach



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Integrated Classroom Lighting System (ICLS)

Overview

- High-performance lighting system
... saves energy & demand
- High-quality direct-indirect light
... happy users



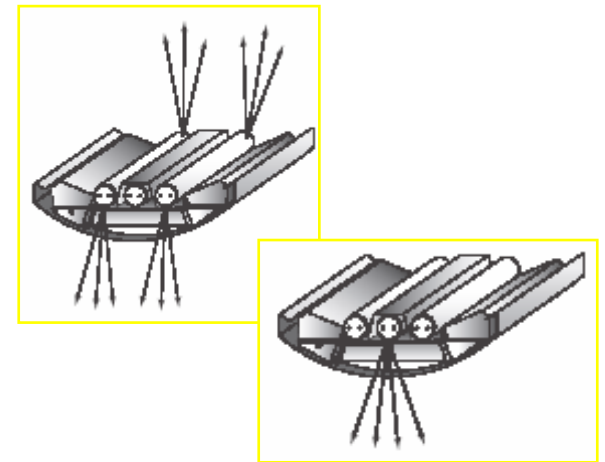
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ICLS—Key Features

- White-board lighting
 - ... functions like task lighting
- High-efficiency components
 - ... “super” T8 lamps
 - ... premium electronic ballasts
 - ... 96% reflectivity paint
- ~0.8–0.9 W/sq-ft connected load
- ~\$2.71/sq-ft for basic system
 - ...vs. ~\$2.86/sq-ft for standard troffers



ICLS—Controls & Availability

- “A/V” mode for low-ambient ... teacher control center
- Integrated occupancy controls
- 1-hour “quiet time” over-ride for tests



Available from Finelite (www.finelite.com)

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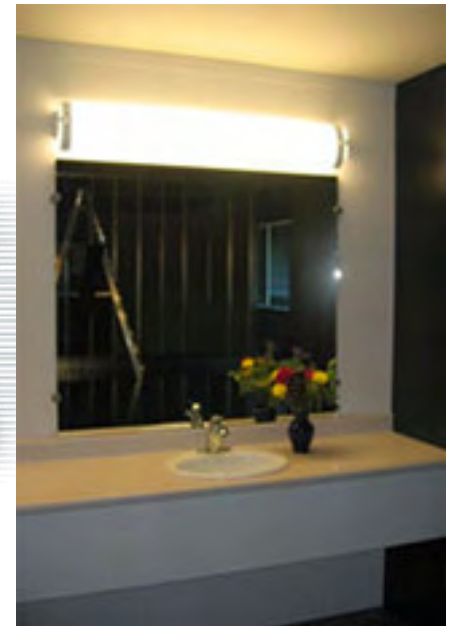
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“Smart” Bathroom Lighting

Overview

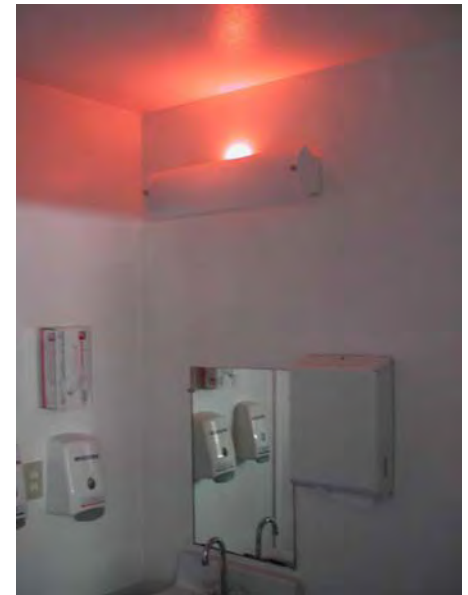
- Integrated LED nightlight & occupancy sensor
- Two versions
...wall switch or full fixture
- ~50% energy savings
- Integrated battery backup = improved safety
- Great application in hotels, assisted living, dorms



“Smart” Bathroom Lighting

Overview

- Integrated occupancy sensor eases design and installation
- Wall-switch version available from two manufacturers
 - ... WattStopper since 2002 (~\$35)
- Full fixture
 - ... production ~\$135 or less (Acuity)



Residential CFL Downlights

Overview

- Plug-and-play wiring greatly reduces costly wire-nut connections.
- Quick, simplified and flexible optical head mounting.
- Two-lamp ballast cuts ballast costs in half...potential low-cost dimming



Residential CFL Downlights

Overview

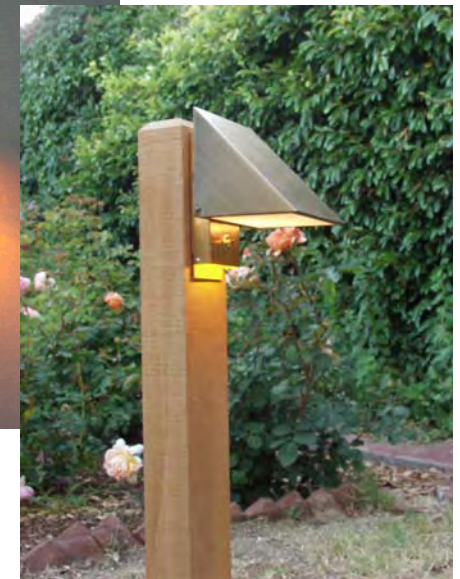
- Thermally-protected electronic ballast ensures reliability.
- Reduce labor cost and energy costs.
- Model CKP-62 from Lithonia



Hybrid LED Exterior Fixtures

Overview

- 5-Watt LED operates all night
- High light level triggered with occupancy
- Wall-mount for buildings
- Post-mount for walkways



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Hybrid LED Exterior Fixtures

Overview

- Shaper/Cooper produced early versions
- Hunter units expected late 2006
- “Security” version in discussion



Hybrid LED Exterior Fixtures

Key Features

- Very low-wattage all night
... beats CFLs
- “Full” lighting when needed
... built-in security indicates occupancy
- LED life ~10-20+ years
... beats CFLs
- Integrated occupancy controls

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And More!!

Available Now

- High-performance residential CFL downlights
- Bi-level stairwell lighting
- Sensor Placement Optimization Tool (SPOT)
- Integrated Ceiling/Skylight Design Guidelines

Coming Soon

- Self-commissioning photosensor

Upcoming Projects

- Simplified daylighting controls
- Integrated Office Lighting System

Increased Outreach

- CLTC Lighting Hub
... consolidating key in-state and out-of-state research and ET resources

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Additional Information

- Current products (ICLS, etc.)
www.archenergy.com/lrp
- Upcoming products
(smart bathroom, new hybrid fixtures, etc.)
www.cltc.ucdavis.edu

Summary

- Collaborative research is more successful than working in isolation
 - ... manufacturers
 - ... field demonstrations
- New lighting products are available now!!



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**Nothing Great Is Ever
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Enthusiasm!!**

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