PIER State Partnership for Energy Efficiency Demonstrations (SPEED)

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Program Goals

- Validate PIER technologies in real-world building applications
- Increase understanding of functionality and technology cost under typical operating conditions
- Provide third party verification of pre-commercial prototypes
- Stimulate market awareness of emerging energy-efficiency building technologies
- Increase energy-efficiency of California demonstration sites
Participating Partners

• University of California, California State University, and California Community Colleges
• Ca Department of General Services
• Ca State Agencies
• Ca cities and municipalities
• Select private sector partners
Total Savings

<table>
<thead>
<tr>
<th>Pounds CO2</th>
<th>Watt Hours</th>
<th>Therms</th>
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<tbody>
<tr>
<td>4,782,440</td>
<td>9,563,337</td>
<td>1,055,080</td>
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UC Irvine

UCI - Engineering Tower

- Bi-Level Smart Stairwell Luminaire - 38 Installations
- Installation Date: 04/01/2006
- Energy Savings since installation: 153 MWh; 0 therms
- CO₂ Savings: 56 metric tons to date

Learn More

- Case Study
- Technical Specifications
- LEED

www.pierpartnershipdemonstrations.com
Bi-level induction luminaires with wireless daylighting controls

- Controls are key: reduce energy use by 30–40%
- Bi-level occupancy controls, wireless RF daylighting controls
- Broad spectrum source, high CRI and CCT
- 80W high mode, 40W low mode
- Induction lamps can last up to 100,000 hours
- Demonstrated energy savings: 65%
Before

- 150W HPS lamps, 170W system
- Continuous operation, 24 hours per day
- Poor lighting quality, CRI ~22, CCT ~2100
- Average maintained illuminance at grade: 8.5 fc
- Annual energy consumption: 268,000 kWh
- Annual electricity cost: $34,300
After

- 70W induction lamp, 80W system
- Wireless daylighting controls reduce operating hours by half
- CRI ~82
- Average maintained illuminance at grade: 4.9 fc
- Estimated **annual energy savings** for full facility retrofit: 174,000 kWh
- Estimated **electricity cost savings** for full facility retrofit: $22,700
- Estimated project cost after partnership incentive: $108,000
- Simple payback on capital investment: 4.75 years
Integrated Office Lighting System (IOLS)

- 0.5 – 1.0 watts/sq ft including task lighting
- Low glare
- Increased user control, flexibility
- Increased lighting quality
- Personal occupancy sensors
- Demonstrated energy savings up to 70%

[Image of office setup]
Before

- Suspended indirect/direct pendants with standard T8 lamps
- Incandescent and fluorescent task lighting
- Power density, including task lighting, 2.38 w/ft$^2$
- Survey results indicated occupant displeasure with quantity and quality of light
After

- High color temperature, super saver T8 lamps
- LED task lighting
- Power density, including task lighting, 0.97 w/ft², overall 44% energy savings
- Occupant surveys indicate an overall positive improvement in light quantity and quality
- Project cost: $21,000
- Simple payback: 3.8 years
PIER Group Purchasing Program

- Web based portal for PIER technologies offered at volume pricing
- Designed for key demonstration partners such as UC, CSU, and CCC campuses
- Links to PIER technology manufacturers, information on PIER technology solutions

Bi-level Exterior

Exterior Lighting, including parking lots, area lighting and security lighting represents 3.067 GWh and 1.4% of California’s energy usage annually. A significant portion of the energy used in exterior applications occurs during periods of limited occupancy in the area of illumination. Bi-level controls, which switch lighting between a high level and a low level rather than between on and off, offer a method to address the energy savings potential of these unoccupied exterior applications. While completely turning off the lighting is often not acceptable, switching to a low level provides enough light for security and for way finding. This opens opportunities for bi-level lighting systems that lower lighting levels during unoccupied periods.

- Everlast 100W Parking Garage Fixture
  Full Spectrum Solutions, Inc.
  List Price: $590 Our Price: $386

- Everlast 100W Parking Lot Cobra Fixture
  Full Spectrum Solutions Inc.
  List Price: $570 Our Price: $363

- Everlast 150W Cobra Roadway Fixture
  Full Spectrum Solutions Inc.
  List Price: $465 Our Price: $319

- Everlast 100W Parking Lot Shoe Box Fixture
  Full Spectrum Solutions Inc.
  List Price: $570 Our Price: $373

- Everlast 70W Wall Pack Fixture
  Full Spectrum Solutions Inc.
  List Price: $500 Our Price: $353
Summary

• Demonstrated PIER technologies save energy and money
• Demonstration program provides method for partners to test drive new lighting technologies
• Group purchasing program provides avenue for volume pricing on selected PIER lighting technologies
• Please visit: www.pierpartnershipdemonstrations.com

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Thank you.

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