



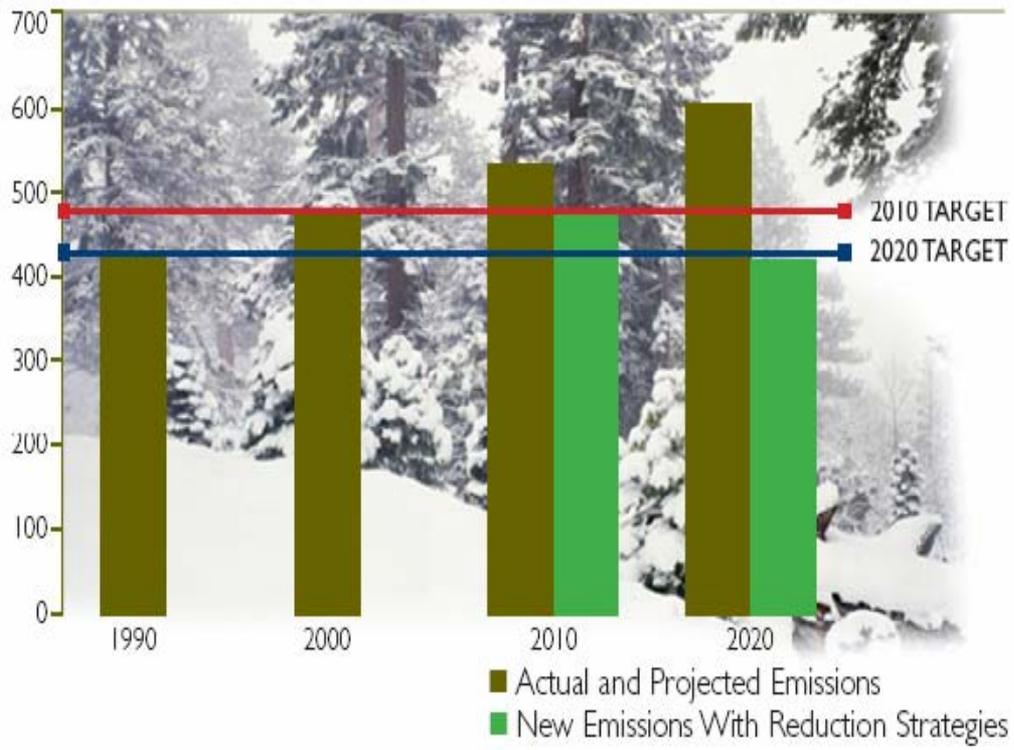
Public Interest Energy Research Program Promising Opportunities

Economic and Technology Advancement Advisory Committee
May 31, 2007

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California Energy Commission



2006 Legislation Provides New Goals and New Urgency for California Energy Sectors



- AB 32 – Global Warming Solutions Act of 2006; aggressive goals for 2020
- SB 1368 – GHG Emissions standards for POUs
- AB 2021 – Energy Efficiency for POUs
- AB 2160 – Green Building Acquisition Financing for State Facilities
- SB107 – Accelerated RPS Goals
- SB1 – Renewables Goals for New and Existing Residential and Commercial
- AB 2778 – Self-Generation Incentive Program for Fuel Cells and Wind
- ***SB 1250 – PIER and Renewables Incentive Programs Reauthorized***



SB 1250 Goals for PIER



Develop and help bring to market, energy technologies that provide increased environmental benefits, greater system reliability, and lower system costs

- Advanced transportation technologies that reduce air pollution and greenhouse gas emissions beyond applicable standards, and that benefit electricity and natural gas ratepayers.
- **Increased energy efficiency in buildings, appliances, lighting, and other applications beyond applicable standards, and that benefit electric utility customers.**
- Advanced electricity generation technologies that exceed applicable standards to increase reductions in greenhouse gas emissions from electricity generation, and that benefit electric utility customers.
- Advanced electricity technologies that reduce or eliminate consumption of water or other finite resources, increase use of renewable energy resources, or improve transmission or distribution of electricity generated from renewable energy resources.



What is PIER?

■ Public Interest Energy Research Program

- Initiated in 1998 as a part of CA deregulation
 - » \$62 million/year for electricity research
 - » \$15 million for natural gas research (budget for 2006)
- Research counterpart to the public goods energy efficiency program administered by the utilities and the Renewables Program administered by the CEC
- The mission of PIER is to conduct public interest energy research that seeks to improve the quality of life...by providing environmentally sound, safe , reliable and affordable energy services and products



PIER Program Areas



- Renewables
- Environmentally Preferred Advanced Generation
- Transportation
- Energy Systems Integration
- Environmental Assessment
- Industrial Agriculture and Water (IAW) Energy Efficiency
- Buildings Energy Efficiency



What's Different About PIER?



- Applied research with strong emphasis on issues and market partnerships – no research for the sake of research
- Strong emphasis on collaborations
 - Avoid duplication/builds on past work/ensures relevance
 - Regular coordination with IOUs via the Emerging Technology Coordinating Council to transition research to the marketplace
 - State partnerships (DGS/DOF, ARB, T-24)
 - Market Partnerships (California builders, Collaborative for High Performance Schools, California Commissioning Collaborative, major equipment manufacturers)
- Leadership role in R&D in the country



Buildings Energy Efficiency Research



■ Mission

Develop or improve energy efficient technologies, strategies and tools to ensure that buildings are efficient, healthy, comfortable and affordable

■ Program Objectives

- Reduce costs and improve performance of energy-using equipment in homes and businesses
- Develop lower cost energy efficient technologies for California's unique conditions
- Conduct research that supports California's Energy Efficiency Standards



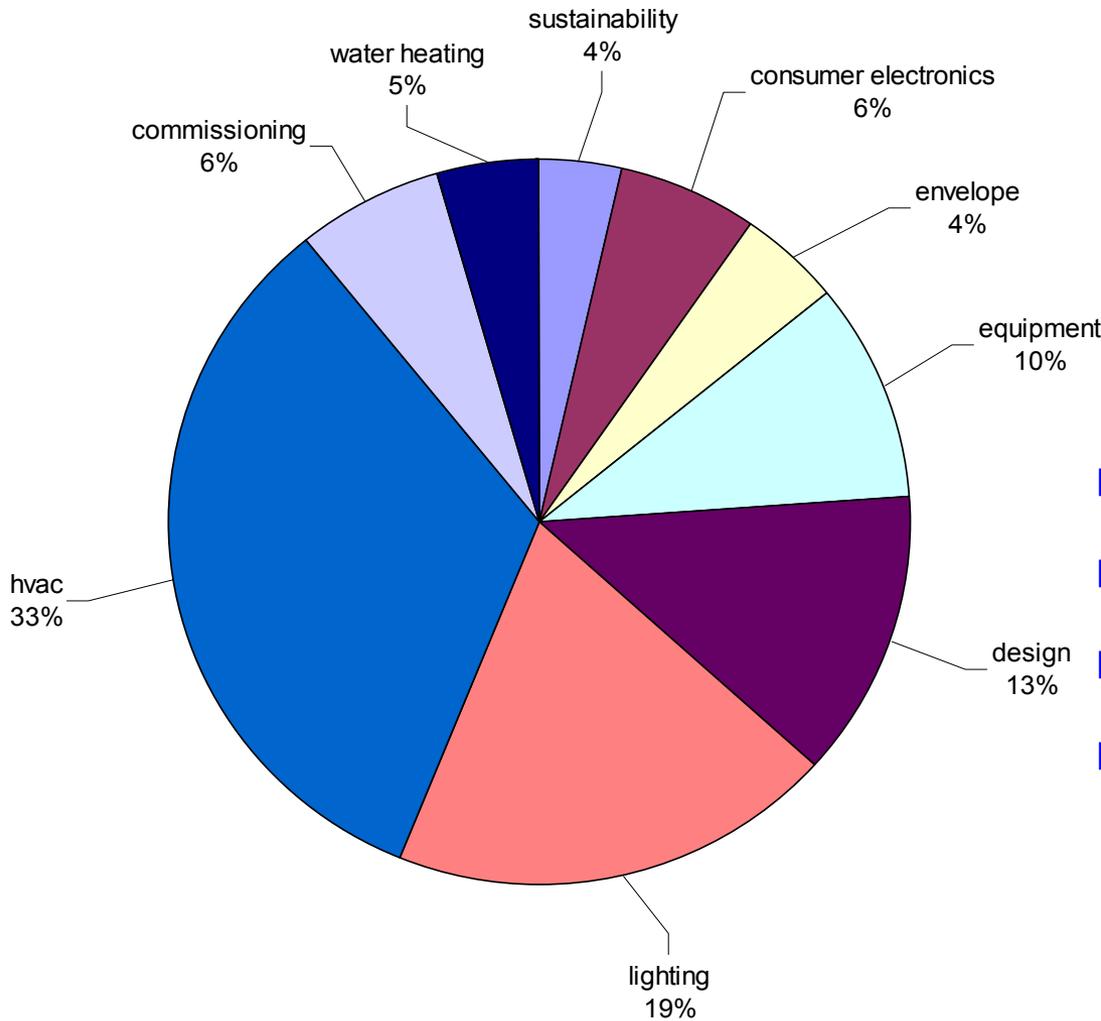
PIER Buildings Program



- Primarily focuses on shorter term, applied research in new and existing buildings
- End uses include lighting, HVAC, building envelopes, water heating, appliances, office equipment
- Research products include design information/specifications, technologies (hardware), software, controls, and others
- Covers the entire building life cycle from component development/design, construction, commissioning, operation



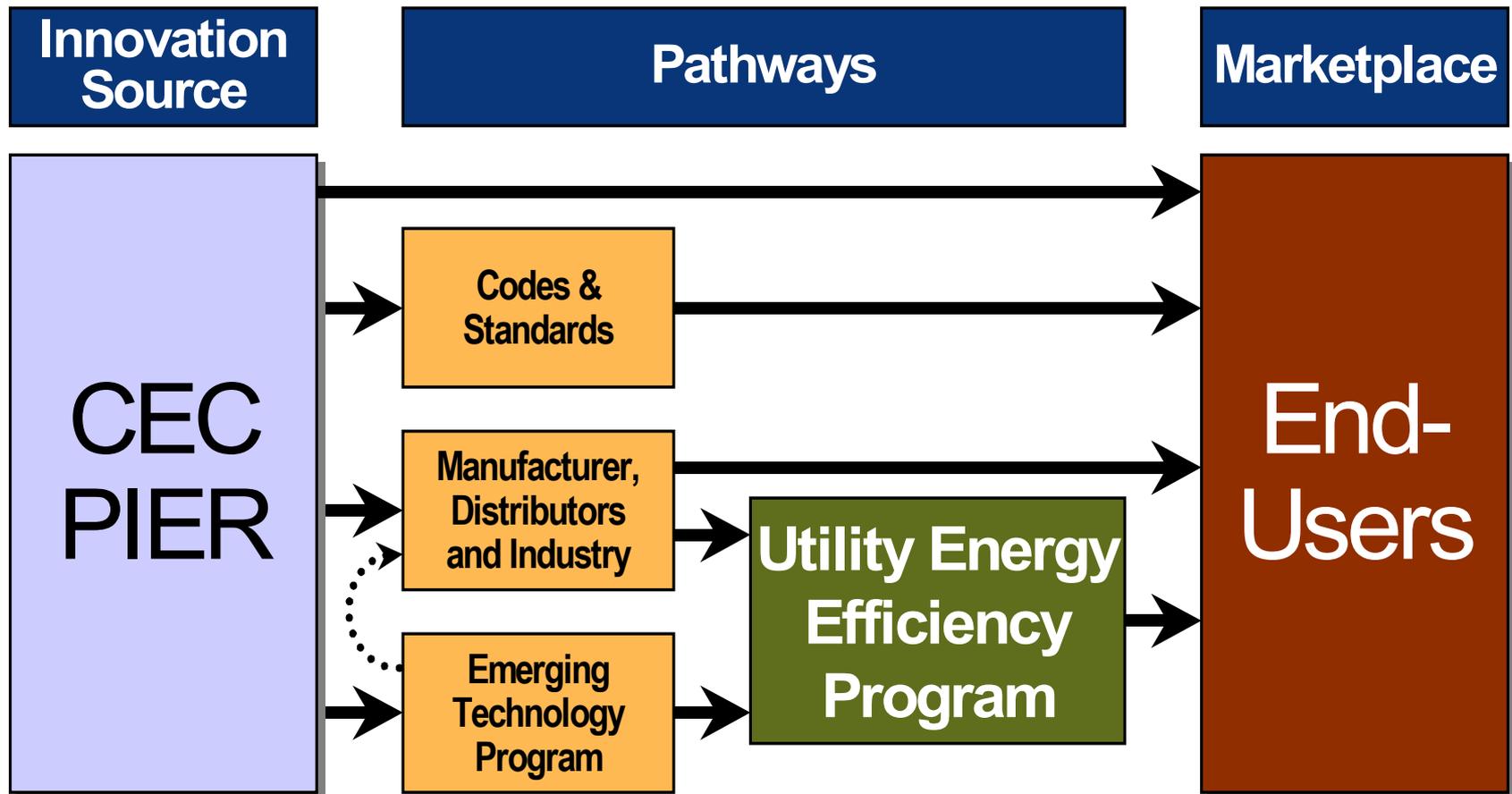
PIER Buildings Portfolio Summary



- Total Portfolio \$99M
- Total Active Portfolio \$53M
- 74 Active Contracts
- 116 Active Projects



PIER Pathways to Market

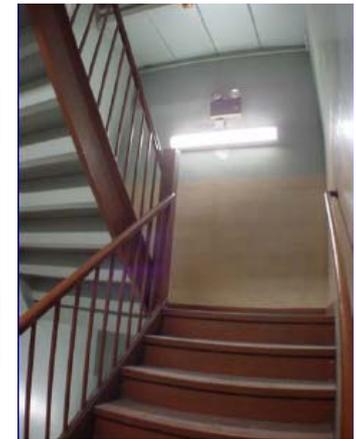




Influencing 2008 T-24 Buildings Standards



- 14 Change Proposals submitted for the 2008 Standards
- Code language is complete for 7:
 - » LED Exterior Lighting
 - » Bi-level Stairwell Fixtures
 - » Load Shedding Florescent Lighting Ballasts
 - » LED Night Lighting in Bathrooms
 - » Integrated Classroom Lighting
 - » Performance Monitoring Specs
- Draft language still in process for 6:
 - » FDD for Packaged Systems (3rd iteration)
 - » FDD for AHUs & VAV Boxes (3rd iteration)
 - » Displacement Ventilation Systems
 - » Underfloor Air Distribution (UFAD)
 - » Residential ACM Attic/Duct Model
 - » Cool Roofs for Residential Buildings
- 1 proposal rejected:
 - » Cool Ducts for Nonresidential Building





UC/CSU Campus Technology Demonstrations



- 11 technologies in 13 campuses – over 40 demonstrations completed
- Detailed evaluations with data on performance and cost
- Technical assistance in identifying and specifying campus applications



**Installation of OA damper with
SpeciFlow air flow measurement
technology**



Commercial Lighting Products



- Integrated Classroom Lighting System
- Classroom Photosensor and Controls
- Sensor Placement and Orientation Tool
- Hotel Bathroom Nightlight
- Bi-Level Stairwell Fixture
- LED Hybrid Outdoor Fixture
- Low-Glare Outdoor Luminaire
- LED Task Light
- Integrated Office Lighting System

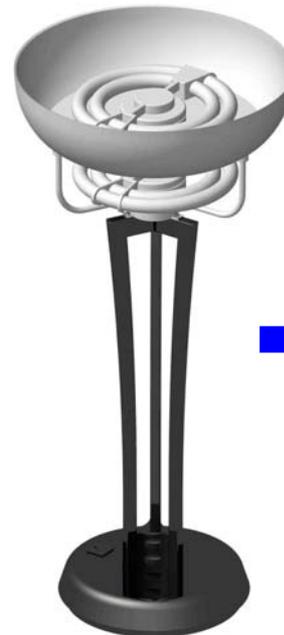


New Lighting Products



- LED office task lighting system @ 50% less energy than per code (Available June 2007)

- Bi-level LED with onboard occupancy sensor (Lightfair 2007)



- Hybrid Porch Luminaire (Available now)

- Small Office / Home Office Consumer Desk and Floor Torchieres (Lightfair 2007)



Commercial HVAC Products

- Small HVAC Design Guide
- Rooftop A/C Diagnostics
- Hot/Dry Air Conditioner
- Improved Classroom Heat Pump
- AHU Functional Test Guide
- Building Vulnerability Assessment Tool
- Green Building Specifications
- Green Building Studio



Other Areas of PIER Research



- Lighting Research Program 2
- Consumer Electronics (TVs and Computers)
- Commercial Building Energy Benchmarking
- Hot Dry Optimized Air Conditioning
- Zero Energy New Homes
- Water Heating
- Cool Roofs
- Commercial Kitchen Equipment
- Building Energy Research Grant (BERG) Program



Want More Information?



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