

Energy Savings in Commercial Office Real Estate: Emerging Opportunities

Market Transformation Symposium
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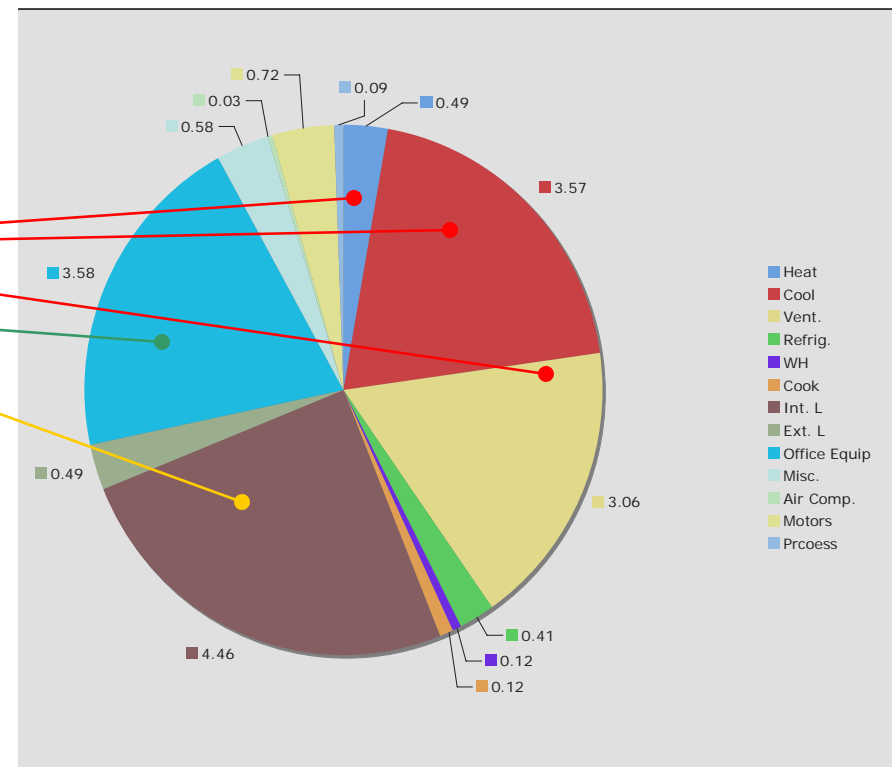
The Premise

- Incentives for standalone technologies are inadequate to offset growing demand
- Systems approach
 - Package appropriate technologies into systems
 - Prescriptive packages rolled into utility EE and DR incentive programs
 - Include all connected electric load
 - Promote communication and interconnectivity
- Move from power density (W/sf) to usage (kWh/sf)
- Incorporate human performance and market influences to increase adoption

Improve Over Baselines (e.g. Title 24, ASHRAE 90.1 2004)
25% 50% 75% Net-Zero Energy

The Promise

- “Typical” office
 - 70% open (cubicles)
 - 30% private offices
 - Cubes 20% smaller since 2000
- Largest Areas of Potential
 - HVAC
 - Plug load
 - Interior lighting
- Trends
 - Team spaces
 - Lower walls
 - Unassigned generic work spaces



Large Office Energy Use

Source: California Commercial End-Use Survey, kWh/sf-yr

Office of the Future: National Collaborative



Utility Challenges

- Incentives have always been “per widget”
 - How to provide incentives for “systems”?
 - How to predict savings with systems that have numerous variables?
 - How to defend savings claims to regulators?
 - How to insure that these Office of the Future system solutions are installed correctly and operated as designed?

The 25% Solution

- Modeling completed 2008
- Off-the Shelf technologies
 - Lighting
 - T8 and T5 lamps
 - Electronic dimming ballasts
 - Controls
 - Plug load
 - Energy Star
 - Controllable with Occupancy Sensors
 - Mechanical system
 - Tune where possible

25% Action Items

- Pilot Programs planned
 - 20-30 pilot demonstrations planned
 - 2-3 per participating utility
 - Testing protocol and M & V plan to be completed 4-09
 - Sites will be “Office of the Building” suites
 - Available for public tours
 - Collect data to enable “defensible” savings expectations as basis for utility program incentives (both EE and DR)
 - Planned completion of Pilot first quarter 2010

Next Steps

- 50 % and Beyond
 - Exploring emerging technologies
 - Surfacing communication protocols
 - Testing and developing advanced controls
 - Forming working partnerships with industry to develop the new technologies necessary to meet the 50% and more goals