



For Businesses



For Homes



Renewable Energy



For Trade Allies



About Us

EnergyTrust of Oregon

Buildings of the Future

CEE Industry Partners Forum
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NOLA



Efficiency Industry- The Heat Is On

- Many utilities and other program deliverers are being asked to double their efficiency goals- or more.
- The alternatives look increasingly unpalatable:
 - Coal= high carbon = risk of high regulatory cost
 - Sequestration is a long ways off
 - Gas= volatile supply and prices.
 - Nuclear= \$\$\$\$, modest potential growth rate, controversial
 - Renewables= can only grow so fast
- “Bucks for better boxes” has worked but may be reaching its limits.
- *Building Energy Use is Not Going Down* due to plug load and HVAC service increases

Energy Trust Efficiency Budget

Oregon investor-owned utilities- this slide for electric only:

2006	\$37M
2007	\$41M
2008	\$55M
2009	\$79M?

- This is not unusual for leading states
- Some states are starting from less and growing faster.

Limits to Current Approach

- “Known” conservation supply is finite-
 - it grows through trying things, not paper study
- Disjointed design process no matter how you build
 - Architect/engineer
 - Design/build bidding process
 - Design vs. build-out
- “Reality gaps”
 - What was specified vs. “as built” (what was ordered and installed)
 - How the building is built vs. run
 - Who understands the problems and opportunities, vs. who is in a position to act

Limits to Current Approach- User Communications

- Financial managers and building ownership, management, and rental organizations do not have an “efficiency profit center” in their organizational structure or business plans
 - So directives to staff do not focus on energy management in design, build-out, or operation
- Feedback on energy use to the designer *or operator* is minimal.

The Solution- A more integrated approach to efficiency

Key components

- **Work at the corporate level with owners, designers, managers, and occupant organizations so they can plan and organize to profit from efficiency**
- **Integrated design- for both initial construction and build-out.**
 - Integrate components
 - Integrate operators into design, and efficiency into operation
 - Simplify efficient design process where feasible
- Component selection for interoperability
- Feedback to designers and operators on energy use.

Program Initiatives are Moving in This Direction

VISION

- Zero Net Energy Buildings (AIA, cities, Ca. state plan, etc etc)

HOW TO DO IT

- New Buildings Institute Core Performance Guidelines
- Office of the Future (SCE led)

HOW TO PROFIT FROM IT

- NEEA “Betterbricks” program
- NYSERDA, Xcel Energy Commercial Real Estate Programs

HOW TO FIT INTO CUSTOMER GOALS

- Energy Trust LEED tracks for construction and buildout
- PG&E “More than a Million”

Interoperability Challenges

- Building energy use can be optimized if equipment talks
 - Compressor staging
 - Fan cycling
 - Static pressure readings
- Trend toward proprietary communication for HVAC unit, EMS, lighting controller- “Every piece is in charge”
- Minimal communications capability from smaller equipment
- Contractors substitute products to reduce costs, mucking up communications capability
- Building is then run as a series of independent, reactive systems

Interoperability Solutions

- Manufacturers work toward consensus on common language for systems *or* ability to communicate with multiple protocols
- Office of the Future- specifies communication requirements quasi-prescriptively for lighting
- Program providers could create preferences or performance specifications for incentives for intercommunications capability
- Designers could specify interoperability performance as a non-substitutable bid requirement
- Potential roles for CEE, in conjunction with industry groups, discussion for tomorrow!

Integrated Design

- More sophisticated program developers and designers work on buildings as systems. BUT:
 - Tenant improvements often occur after “efficiency project” is done through a different decision process and supply chain. Information as lost from design process.
 - Operators are rarely consulted on design, nor clued in to design intent
- Office of the Future- an effort to address these issues comprehensively, starting with tenant improvements as the framework