



Using less. Doing more.

*How Can Energy Reporting
Accelerate CLS Deployment?*

Role of Codes and Standards

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DOE CONNECTED LIGHTING SYSTEMS WORKSHOP

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Alliance to Save Energy: Working with all Sectors to Accelerate Energy Productivity

Business ▪ Government ▪ Public Interest



Overview

- Lighting as a system
- How codes & standards support CLS
- How CLS energy reporting can improve codes & standards
- Future prospects – energy savings & beyond

Why Systems Efficiency?

- Product-level efficiency: large remaining potential but diminishing returns (?)
- Systems efficiency vs device-level: 2x to 10x gains
- Whole-building efficiency matters – but based on efficient components
- Non-energy benefits

SEI Year 1 Report



GREATER THAN THE **SUM OF ITS PARTS**

THE CASE FOR A SYSTEMS APPROACH
TO ENERGY EFFICIENCY



Using less. Doing more.

Strategies for System Efficiency

- ***Optimize technology***
- ***Effective integration*** within & among systems
- ***Systems thinking throughout building life cycle***
- ***Break down silos***
 - industry stakeholders
 - industry and policymakers
- ***Think outside the building*** – campus, community, B2G

System Efficiency Initiative 2016+

- Outreach + recruitment
- Modeling (multi-) system performance
- Scope:
 - Local energy production, storage, exchange
 - DC power distribution
 - Building life-cycle
 - Added building types
- *Action Roadmap*

The Value of Energy Data Reporting

- Energy data as a selling point
 - “You can’t manage what you can’t measure,” but also...
 - “You can’t manage when drowning in measurements!”
- Is it worthwhile to “measure & manage” \$5/year of energy?
 - Yes, if target high-occupancy buildings, high-cost areas, and critical peak periods
 - And, if energy & peak kW savings come “free” due to:
 - Lower-cost Installation, modification, maintenance
 - New services to occupants and the grid

Codes and Standards: Current Provisions related to CLS

- Building codes (90.1, IECC, Title 24) require:
 - Max. lighting power density (W/sqft)
 - Occupancy/vacancy + daylighting controls
 - Controls documentation & functional testing
 - Added LPD allowance for advanced controls
- Stretch Codes (e.g. ASHRAE 189.1)
 - Hourly kWh reporting & logging
- Appliance standards and Energy Star
 - W or kWh allowance for “connected products”
 - No requirement or incentive for data reporting

What CLS Energy Reporting Can Do for Codes and Standards

- Verify actual performance & savings
 - For efficiency standards: improved test methods and cost-effectiveness estimates
 - For codes: more accurate LPD controls credit, and
 - Support for “outcome-based” code compliance
- New metrics for “delivered lighting services”
 - kWh per lumen-hour
 - kWh per occupant-hour at XXX lumens
- New business models for lighting:
Selling hardware → selling services (+ energy?)

What Codes & Standards (etc.!) Can Do for CLS and Energy Reporting

- Labeling & recognition (LEED, Energy Star)
- X-prizes and “technology procurement”
- Utility rebates, tax incentives
- Building subsystem benchmarking
- ESCO contracting:
 - Pro’s and con’s of measured data!
- Codes and standards
 - Require (encourage) CLS with data reporting?
 - OR, data reporting for all end-use devices?

THANK YOU!

For more information:

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