



CBEA Market Transformation Team

Discussion Materials for
Energy Efficiency Forum

May 23-24, 2012

1. Introductions
2. Review of Day 1 Outcomes (Diane Vrkic, 10 minutes)
3. Building Re-Tuning Overview (Andres Potes and Srinivas Katipamula, 15 minutes)
 - Commissioning overview and business case
 - What is building re-tuning?
 - CBEA Market Transformation team re-tuning activity
 - PNNL Training Opportunities
4. Re-tuning Testimonials, Discussion, Q&A (Andres Potes, 30 minutes)
5. Green leasing Discussion (Andres Potes, 20 minutes)
6. Session outcomes and next steps (Diane Vrkic, 10 minutes)

Based on the outcomes of the Day 1 sessions, strategic priorities for collaboration may include:

1. Economic/Technical Viability Case Studies
2. Tenant Educational Materials
3. Utility Data Availability
4. Promotion of Integrated Design
5. Technology Vetting
6. Scaling of Sub-Metering
7. Improving Data Connectivity (e.g, Smart Metering, Other IT)

Feedback indicated that Re-Tuning should be the highest priority for the team

CBEA Market Transformation Team Activity Rankings

Team Member Type	Green Leasing*	Database*	Re-Tuning	Financial Ally*	On bill
Owner Ranking	3.8	1.8	1.3	4.0	3.5
Property Manager Ranking	1.3	4.0	3.3	2.0	3.7
Integrated Owner/Mgr. Ranking	3.0	3.0	1.7	3.3	3.7
Overall Ranking	2.8	2.8	2.0	3.2	3.6

Member Ranking of Activities (1 = first priority , 5 = last priority)

***Currently under way**

Business Case

- Arguably the most cost-effective strategy for reducing energy, costs, and GHG emissions in buildings
- Studies estimate \$30 billion/year in potential energy savings by 2030

Commissioning Study Results

	Existing	New
Energy Savings	16%	13%
Payback (years)	1.1	4.2
Cost-Benefit Ratio	4.5	1.1
Cash-On-Cash Return	91%	23%

145 office buildings in the study had combined 22% energy savings and a 1.1 year payback

Source: Mills, 2010; Lawrence Berkeley National Laboratory

- Lack of awareness of benefits
- Costs
 - Service providers
 - Training
- Risks
 - Savings not delivered
 - No ability to track savings
 - Savings do not last
- Absence of requirements in building codes

What is Building Re-Tuning?

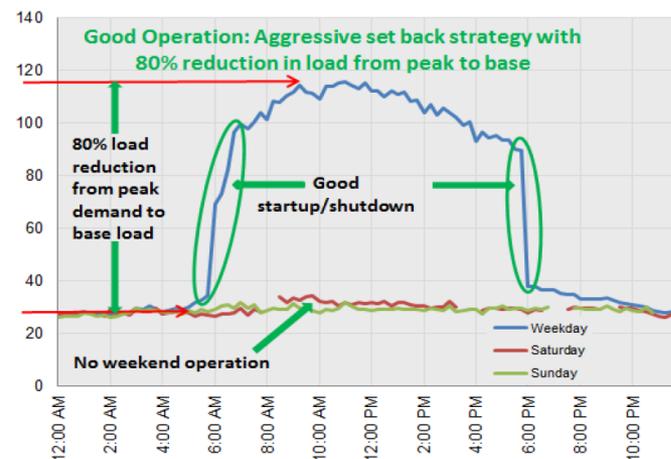
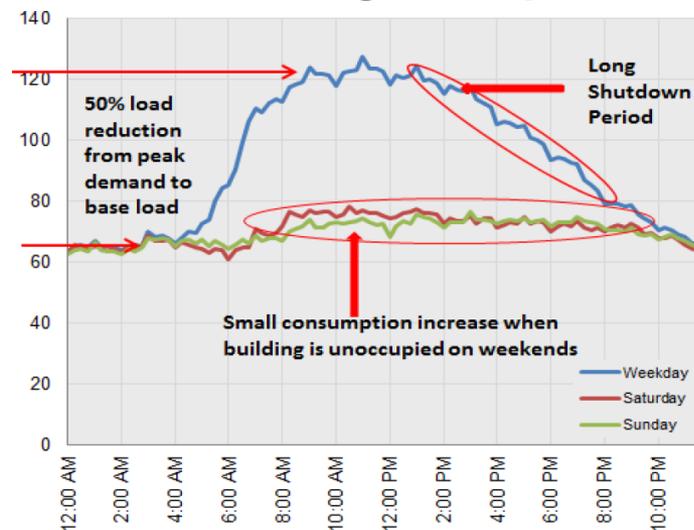
- A scaled-down retro-commissioning focused on identifying and correcting operational problems
- Implemented through the building control system at no cost other than the labor required to perform re-tuning process
- May include small, low-cost repairs, such as replacing faulty sensors
- DOE developed a commercial building re-tuning training through Pacific Northwest National Laboratory (PNNL)
- The training is targeted for large buildings, and a small- to medium-size building training is in development
- PNNL developed an analysis tool which uses data directly exported from a BAS system

"Thank you for the great opportunity you have given to the Crowne Plaza in Times Square. I have been to a lot of seminars and training in my day and I will say the retuning training really focused on actionable steps the operating engineer can take to capture energy savings while maintaining occupant comfort."

- Vincent Curcio, Grubb & Ellis

- Major focus areas
 - Occupancy scheduling
 - Discharge-air temperature and pressure control
 - Air-handling unit (AHU)
 - Zone conditioning
 - Meter profiles
 - Central plant
- Six Steps of Re-Tuning
 1. Collecting initial building information
 2. Trend data collection and analysis
 3. Identifying and correcting operations problems
 4. Building Walk Down – Getting to know the building
 5. Reporting re-tuning findings
 6. Determining and reporting impacts

Occupancy Scheduling Re-Tuning Example



Example: Sam Nunn Atlanta Federal Center

Building Specifications

- 1.8 million square feet, 2 city block high rise
- 10 MW
- 4 chillers
 - Three 1,500 ton
 - One 500 ton
- ~ 100 air handlers



Major Changes

- Identified that two 500 sf server rooms were driving the cost in an 1.8 million sf building
- Changed chiller temperature set points and running times

Results

- Received Energy Star rating
- Energy down 15% to 20%
- ROI - 3 months
- Peak down on shoulder months
- Tenant complaints down 35%

- DOE will offer 1-3 on-site train-the-trainer sessions on re-tuning
- Market Transformation team members enroll in trainings and commit to implementing the training throughout their organizations
- DOE and members collaborate on measuring and sharing results with other CBEA members



Pacific Northwest
NATIONAL LABORATORY

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www.retuning.org

www.pnl.gov

- Does your organization implement systematic commissioning?
 - If so, how? (in-house training vs. contracting)
 - If not, why not?
- Does your organization provide any other O&M training?
- At what staff levels are trainings applied? (senior facility managers or individual building managers)
- What are barriers to systematic implementation of commissioning / re-tuning practices?
- What strategies can the market transformation team deploy to more broadly distribute and market the training?
- Are you interested in PNNL re-tuning trainings?

- Adam Sledd, Institute for Market Transformation
- Green Leasing Discussion and Next Steps
 - Energy efficient lease clauses vs. standard cost pass-through clauses
 - Strategies to engage tenant organizations
 - Other success stories
 - Additional barriers to implementation

Agenda:

1. Introductions
2. Opportunities for Collaboration on Exterior Lighting Campaign (P. Wessel, GPC, K. Penafiel, BOMA – 30 min)
3. Other Partnership Opportunities (Diane Vrkic Facilitating - 30 min)
 - With Academia:
 - Data Collection, Sharing, Aggregation, and Analysis
 - Development of Financial Metrics for Efficiency
 - With Industry Partners
 - Bulk Purchasing
4. Collaboration Next Steps/Takeaways (Diane Vrkic - 10 min)
5. Open Forum (Diane Vrkic Facilitating - 20 min)
 - Chance for all partners to share ideas that they have not had a chance to share yet

Taking our Lighting Specs Downstream:

**High Efficiency Lighting Specifications
meet the Parking &
Building Management Industries**

The Opportunity:

- Energy savings of over 30% compared to ASHRAE 90.1-2010, and 50% or more compared to earlier codes. Add controls and daylighting to save even more.
- Reduced maintenance, user satisfaction
- Accelerated uptake of new technologies
- Taking our specs on the road:
 - Smaller organizations
 - Complicated management structures



Goals:

- Increase the number of parking lots and parking structures that deliver attractive lighting while saving energy and money
- Document best practices and resulting energy savings
- Recognize successes
- Help companies make business case
- Usability testing
- Inspire evangelists



Questions looking to answer

- What are the obstacles to adoption and how do we overcome them?
- How do the specifications work in the marketplace?
- What inhibits the market?
 - Lack of knowledge?
 - Long term ROI?
 - Disconnects between building owner, building manager and parking operator?
- How do we create evangelists?
- What's the role of lighting vendors and installers?
- How do we best build this collaboration?



High Efficiency Exterior Lighting Campaign

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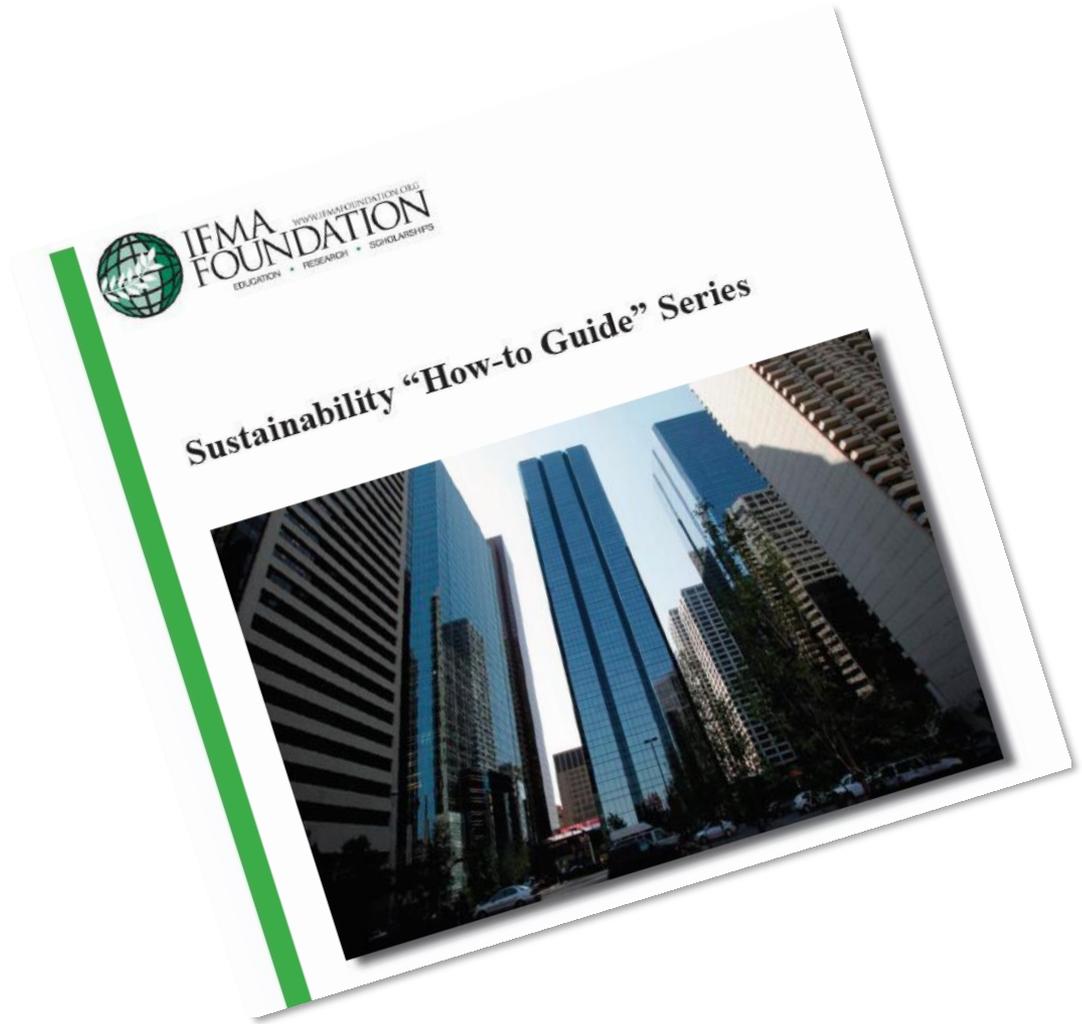
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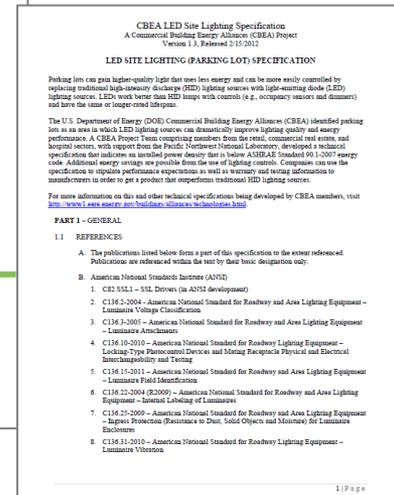
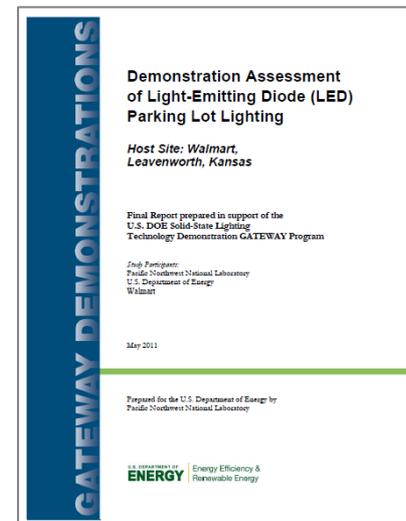


High Efficiency Exterior Lighting Campaign



Building owner/manager/parking operator role:

- **Evaluate** the business case with the help of Lighting Campaign resources
- **Build or retrofit** at least one parking lot or parking structure to meet the spec
- **Report** expected and actual energy savings (kWh/ft²)
- **Share** feedback to improve these resources and enable replication by others



High Efficiency Exterior Lighting Campaign

Available Resources:

- CBEA lighting specifications
- M&V guidance
- Gateway demonstrations
- Financial tools (coming soon)

Recognition for:

- Best implementation model across a portfolio
- Best application of controls
- Greatest energy savings: single site, and portfolio-wide

Official Launch Fall 2012



Naming the Campaign:

lu·mi·nary  *noun* \ˈlū-mə-ner-ē\
plural **lu·mi·nar·ies**

Definition of LUMINARY 

1 : a person of prominence or brilliant achievement

2 : a body that gives light; *especially* : one of the celestial bodies

— **luminary** *adjective*

Partners and Contacts:



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CBEA Lighting Project Team
Resources:

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Options for Collaboration include:

- Collaboration with CBEA Technical Project Teams
- Collaboration with Academia
- Collaboration with NGOs
- Collaboration with Private Firms (e.g. Finance, Manufacturing)