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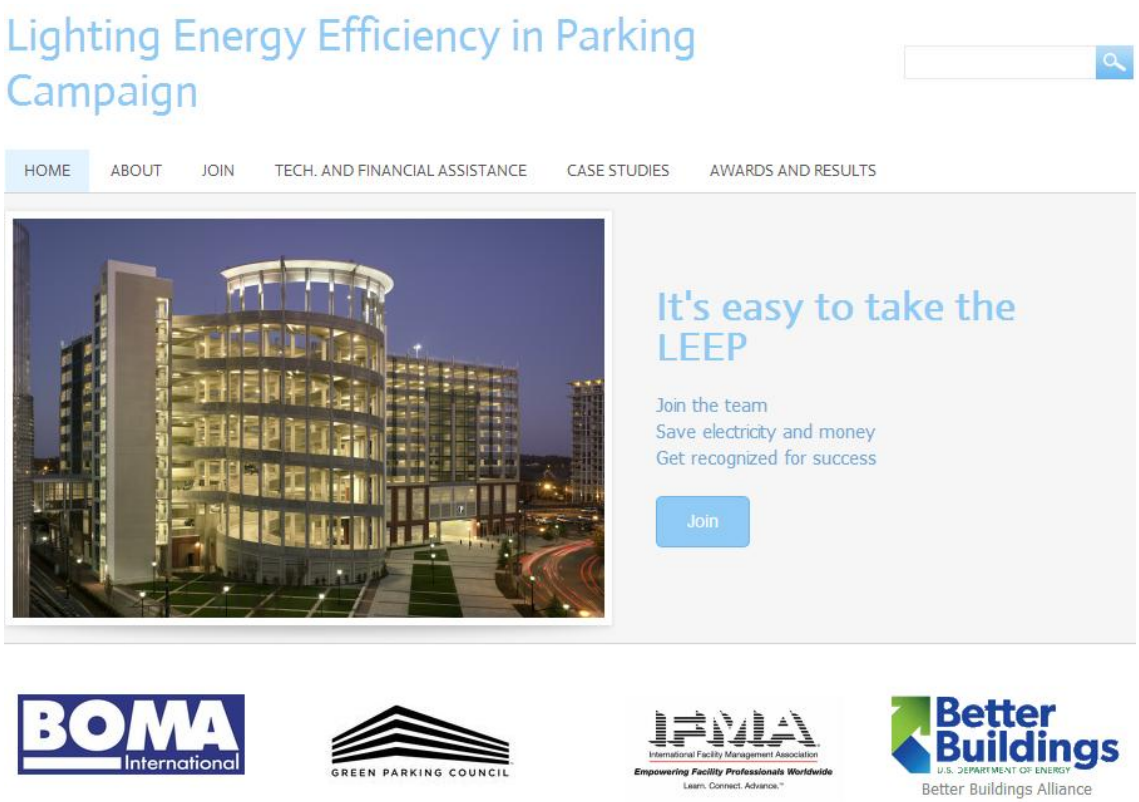

Lighting Energy Efficiency in Parking (LEEP) Campaign

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April 2, 2013

While new lighting technologies such as LEDs have the potential for energy savings of 75%, or more when paired with controls, there are both technology and market-related challenges.

Technology Challenges

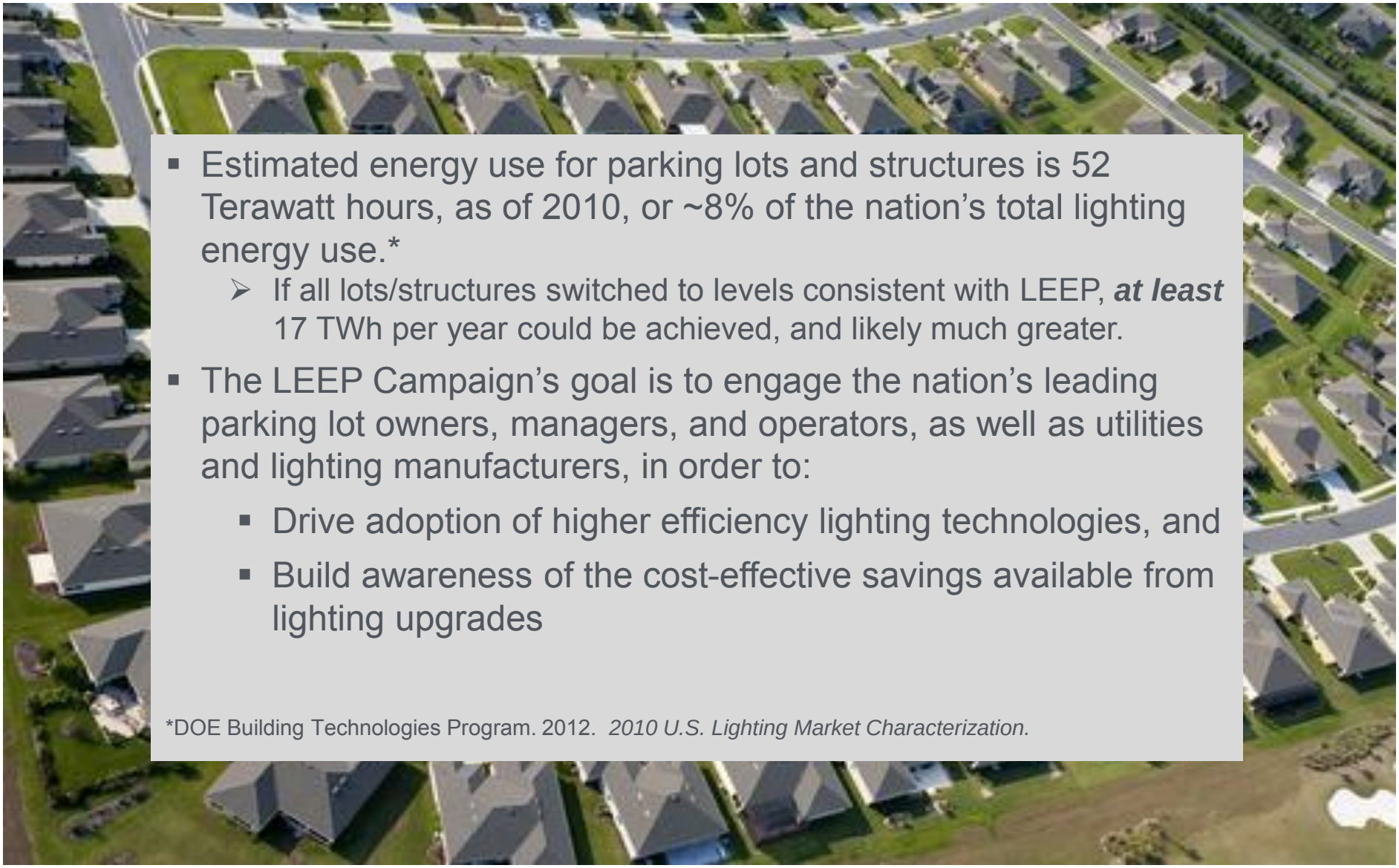
- Product performance varies widely, and manufacturer claims are often exaggerated.
- Site design component is critical since LED technology performs significantly differently than incumbent technologies, thus the need for performance specifications.
  - Performance specifications must be revisited periodically for updates or enhancements, given this is an emerging technology.
- LED technology requires new approaches to measuring and verifying performance.
- LEDs offer a unique opportunity to add controls. Exterior lighting offers some of the best opportunities, but there are a number of technical challenges.

Market Challenges

- This isn't a "plug and play" application; early adopters must be well informed.
- Site owners want help building the business case.
- Site owners want confidence that the lighting will perform as claimed.
  - They first want proof that others have done it successfully.
  - They want straightforward solutions, ideally from an unbiased 3rd party like DOE.
  - A first step is often a demonstration project. Success may lead to additional sites. Failure means they will avoid the technology in the future.
  - They want to know what should be included in an RFP.
- DOE BBA resources are available to help achieve lighting energy savings with a payback of 2-5 years in parking facilities, but these resources are underutilized.

For greater impact, we must address the technical and market challenges, and reach the larger commercial buildings industry.

Purpose & Objectives: Impact of Project



- Estimated energy use for parking lots and structures is 52 Terawatt hours, as of 2010, or ~8% of the nation's total lighting energy use.*
  - If all lots/structures switched to levels consistent with LEEP, ***at least*** 17 TWh per year could be achieved, and likely much greater.
- The LEEP Campaign's goal is to engage the nation's leading parking lot owners, managers, and operators, as well as utilities and lighting manufacturers, in order to:
  - Drive adoption of higher efficiency lighting technologies, and
  - Build awareness of the cost-effective savings available from lighting upgrades

*DOE Building Technologies Program. 2012. *2010 U.S. Lighting Market Characterization.*

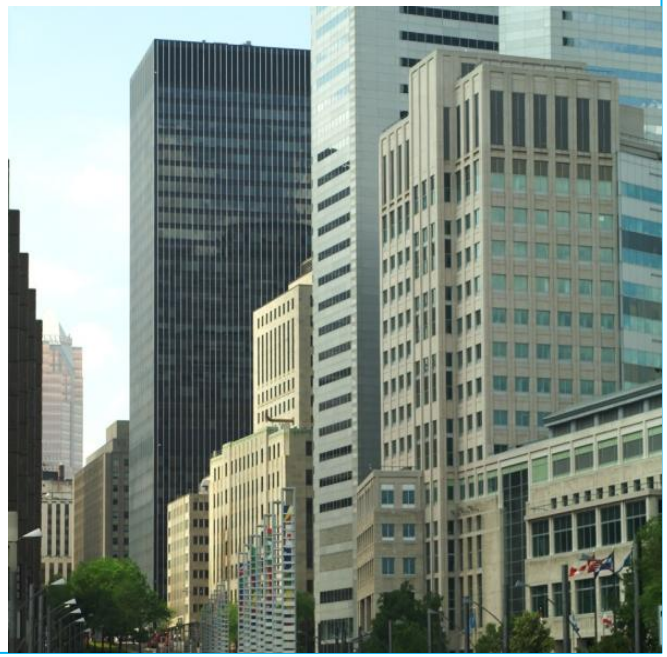
Purpose & Objectives: Project Focus

This project aligns with one of BTO's five mid-term goals identified in the FY 2013 DOE Budget Request to Congress*:

Existing Commercial Buildings: Reduce the energy required to operate existing commercial buildings by 40 percent, at less than the cost of the energy saved. Bring needed technologies and practices to market delivering:

- 1,600 trillion BTUs in annual savings by 2020
- 6,000 trillion BTUs in annual savings by 2030

*From the BTO FY 13 budget request, volume 3 (EERE): http://www.cfo.doe.gov/budget/13budget/index13.html



Approach

Collaboration

BOMA International

GREEN PARKING COUNCIL

IFMA International Facility Management Association

Better Buildings U.S. DEPARTMENT OF ENERGY

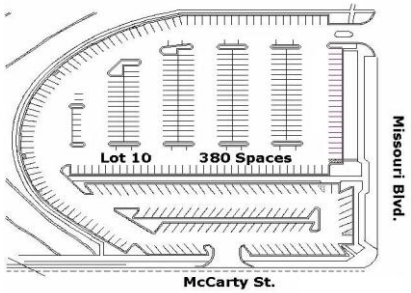
BETTER BUILDINGS ALLIANCE

DOE provides tools and technical assistance to Participants in helping the Campaign Organizers maximize participation

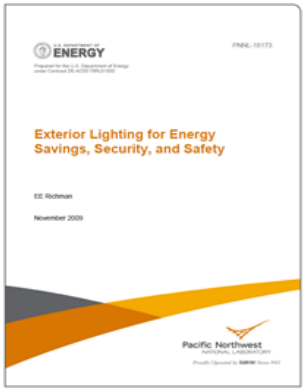
– Implementation resources to support technology adoption include:

Case Studies

Specifications



Technical Assistance (limited)



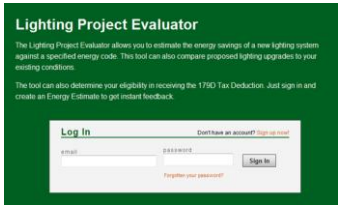
M&V guidance

Parking Garage

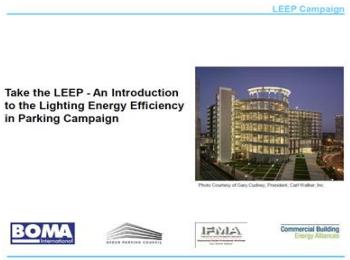
Utility	State	Technology	Product	Rebate Amount
Alliant Energy	IA	LED	Fixture	$30
Alliant Energy	IA	Controls	Occupancy Sensor	$20

Parking Garage | Parking Lot | Financing

List of utility incentives



Energy Estimator to compare against code



Webinars

Approach (continued)

Key Issues:

- Long lead times for site selection -> design -> construction means that many sites will not have been completed buy the end of the Campaign's duration (site info due January 2014).
- Site information can be difficult to capture.

Distinctive Characteristics:

- Collaborative effort with industry that leverages resources developed by the BBA's Lighting & Electrical Project Team.

Accomplishments to date:

- Since the formal launch in the fall of 2012, the LEEP campaign has grown to include over **120 organizations**, including **66 Participants** and **55 Supporters** in over **25 states**.
- So far, the planned for or implemented efficient lighting represented by Participants is approximately **73 million sq. ft.** of parking space, and this is only with 17 Participants reporting.
  - Deadline for participants to report site information is December 2013.
  - Most Participants (70%) have requested Technical Assistance and have not yet submitted data to include towards the LEEP 100 Million Sq. Ft. goal total.

Progress on Goals:

- LEEP Campaign organization established in mid-2012 with strategic partners.
- Project infrastructure established (e.g. “Join” form, web site, and TA process).
- LEEP Campaign allows us to more easily track progress of this emerging technology – and of DOE’s role in developing transformative specifications.
- We fully expect to exceed 100 million sq. ft. of commercial parking space this year, with the potential to impact significantly more space if we extend the campaign for another 12 months

Accomplishments and Progress (continued)

66 Registered LEEP Participants as of March 1, 2013

ABM Facility Services	Ford Motor Company	Providence Heath & Services
AGC Banquet & Event Center	Franklin Resources Inc.	Prudential Real Estate
Alexandria Real Estate Equities, Inc.	Georgia Building Authority	PTP Management, Inc.
AllBright Management Professionals	Groupe Pacific	Santa Barbara County
Allentown Parking Authority	Grubb Ventures	Shelor Motor Mile
American Realty Advisors	Hines (3)	SNC Lavalin Inc.
AT&T (2)	Horizon Solutions LLC	Standard Parking
Blue Hill Partners	Jones Lang LaSalle	State of Missouri
Bradford Exchange	Julin Realty Services, LLC	Sumner School District
Brookfield Office Properties	M C Realty Group LLC	Supervalu, Inc. (3)
Brookshire Brothers	MD Anderson Cancer Center	The Hermitage Centre
CC Frost Properties, LTD	MGM Resorts International	Tower Companies
CentraCare Health System	Midwest Moving & Storing	Town of Amherst
City of Melrose	Miller-Valentine Group	U.S. Army Reserve Parks Reserve Forces Training Area
City of San Jose, Department of Transportation	Morlin Asset Management	U.S. Army - Army Test and Evaluation Command Sain Engineering Associates/Dugway Proving Ground
Compass Properties, LLC	Newmark Grubb Knight Frank	US Air Force Lackland, AFB
Crescent Real Estate Equities	Parmenter Realty Partners	Village of Great Neck Plaza
Department of Defense Joint Base San Antonio	Perry CSD	Von Braun Center
Dept. of Veterans Affairs (Perry Point, MD)	Point Park University	Walmart
Downtown DC Business Improvement District	Prologis L.P.	Wells Fargo Insurance USA
		Wyndham

Accomplishments and Progress
(continued)

Walmart

- Roughly 260 sites to date with over 70 million sq/ft installed or quoted
- Utilizes the BBA Parking Lot spec
- Good economics on retrofits
- Challenge: Competing for capital
- Optimally designed LED site lighting has reduced energy by > 50% and significantly deferred maintenance, which drives the economics.
- To assure safe, optimum site designs, Walmart instituted required training program for designers/engineers.
- Walmart also taking advantage of other BBA resources for Parking Structures and Ambient Lighting.

MGM RESORTS INTERNATIONAL™

- Issued an agnostic RFP to 7 contractors for 12 Las Vegas properties
  - 1,700 fixtures
  - Induction technology selected
- Finalizing a bid award for 2.65 MSF of parking garage space at MGM Grand Detroit.
  - 3,117 fixtures
  - LED's technology selected
- Highly values reduction of waste stream from increased product life and reduced packaging waste.
- Also taking advantage of other BBA resources on interior/exterior spaces.

LEEP Supporters include:

Project Plan & Schedule

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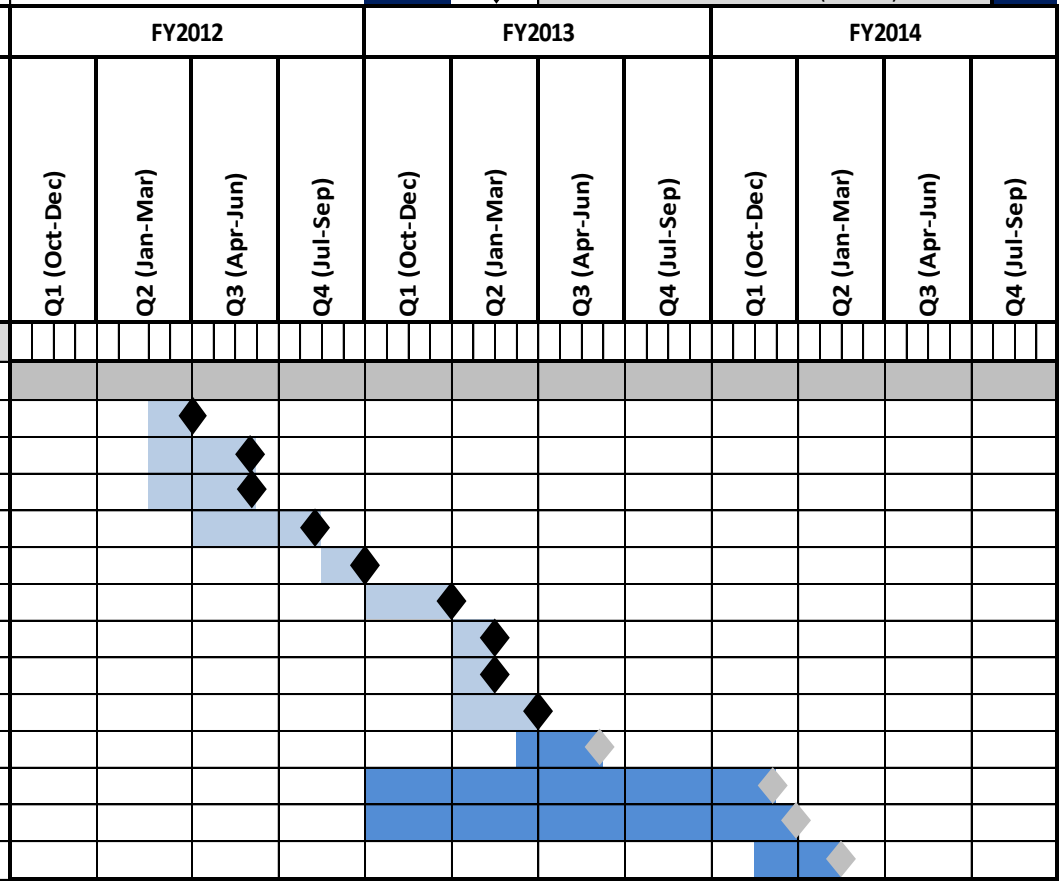
Summary	
CBI_PNNL-FY13-05	
CPS Agreement # 19991	

Legend

- Work completed
- Active Task
- Milestones & Deliverables (Original Plan)
- Milestones & Deliverables (Actual)



Task / Event
Lighting Energy Efficiency in Parking Campaign
Draft Project Plan completed. Campaign planning initiated. (Mar 2012)
LEEP Campaign Organizers Secured (May 2012)
LEEP Campaign announced at BBA Efficiency Forum (May 2012)
LEEP Campaign web site launched (July 2012)
LEEP Campaign "Launched" by Partners via webinar (Sept 2012)
FY13 Quarter 1 Report to DOE highlighting LEEP progress (Dec 2012 and Quarterly)
BBA Exterior Lighting Project Team meeting to discuss LEEP status (Feb 2013)
BOMA sponsored LEEP Campaign webinar delivered (Feb 2013)
FY13 Quarter 2 Report to DOE highlighting LEEP participation (Mar 2013)
BBA Efficiency Forum - LEEP Highlighted (May 2013)
Last date to Join LEEP as a Participant. (Nov 2013)
Last date to submit site information for LEEP Award consideration (Dec 2013)
BOMA/IFMA/GPC Make LEEP Campaign Awards (Feb 2013)

Project Budget

Project Budget: $375K

Variances: None

Cost to Date: $174K (46%)

Additional Funding: The Federal Energy Management Program provides LEEP technical assistance to support Federal sites ($6K to date).

Budget History			
FY2012		FY2013	
DOE	Cost-share	DOE	Cost-share
$50K		$325K	

Project Integration, Collaboration & Market Impact

Partners, Subcontractors, and Collaborators:

- Partners: BOMA, IFMA, GPC
- Subcontractors:
  - Cline Bettridge Bernstein Lighting Design
  - Aurora Lighting Design, Inc.
- Collaborators:
  - Consultant/Designer/Engineer/Esco (12)
  - Distributor/Manufacturer (19)
  - Energy efficiency org/utility/other (15)
- LEEP Campaign is closely tied with the BBA Lighting & Electrical Project Team activities.
- LBNL and UC Davis/CLTC supports a BBA adaptive exterior lighting controls project and coordinates with PNNL LEEP technical staff.

Technology Transfer, Deployment, Market Impact:

The LEEP Campaign takes the technical resources and tools being developed by the BBA to support the design and retrofit of parking facilities to high efficiency performance levels, and makes this high potential technology/application more visible through an awards and recognition campaign managed by private sector partners. This increase in visibility and awareness in the marketplace is expected to increase the rate of market adoption of high efficiency lighting technologies.

Project Integration, Collaboration & Market Impact

Communications:

- Announcement at 2012 BBA Efficiency Forum (May 2012)
- LEEP Launch webinar hosted by Green Parking Council (457 attendees) (Sep 2012)
- LEEP Campaign flier shared at Midwest Energy Solutions Conference held (Jan 2013)
- LEEP Status update webinar hosted by BOMA with industry speakers (400 attendees) (Feb 2013)
- BBA Efficiency Forum (May 2013) (planned)
- LEEP Partners have presented information on Campaign at a number of National and regional forums.
- DOE's Technical Information Network for SSL (TINSSL) provides updates in monthly meetings and periodic web events.
- DOE SSL Program and DOE/Federal Energy Management Program have made announcements on the LEEP Campaign to their listservs.

Next Steps and Future Plans:

- Review LEEP Campaign model for potential replication to speed market adoption of other energy-efficient technologies/applications.
- Possibly extend LEEP Campaign timeline to allow for:
  - Additional Participants and awards into 2014.
  - Increased coordination with partners, including designers and financers.
  - Increased coordination with Utility Supporters, who may begin offering more prescriptive incentives in 2014.