



Better Buildings Alliance

Building Technologies Office

Kristen Taddonio

DOE/EERE/BTO/Commercial Program

Kristen.Taddonio@ee.doe.gov

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BTO Goals:

BTO supports the development and deployment of technologies and systems to reduce building energy use by 50 percent, saving ~\$2.2 trillion in energy-related costs.



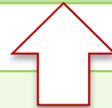
CBI Program Goals:

New Buildings

- Demonstrate 50% cost-effective savings at a convincing scale by 2020 (EISA 2007)
- Demonstrate 100% cost-effective savings at a convincing scale by 2030 (EISA 2007)

Existing Buildings

- **Demonstrate upgrades with 20% cost-effective savings by 2020 (Better Buildings)**
- Demonstrate 100% cost-effective savings at a convincing scale by 2050 (EISA 2007)



Better Buildings Goal:

Demonstrate upgrades with 20% cost-effective savings by 2020 (Better Buildings) – Better Buildings Alliance is key part of the strategy

U.S. commercial building retrofit investment opportunity is over **\$70B** with the potential to realize up to **848 trillion Btu** in savings over 10 years

The technologies are there...
The payback is there...

Persistent barriers

= **Lack of demand**

= **Underinvestment**



2012 Study by the Rockefeller Foundation and Deutsche Bank

<http://www.rockefellerfoundation.org/news/publications/united-states-building-energy-efficiency>



Objective:

- Buildings 20% more efficient by 2020
- Save more than \$40 billion annually
- Create jobs in the USA

How:

- Leadership
- Results
- Transparency
- Best Practice Models
- Recognition
- Catalyzing Action



110+ Partners (Commercial,
Industrial, Public, Private)

2 Billion Square Feet

\$2 Billion Private Sector Financing

300 Manufacturing plants

2 Billion Federal commitment

DOE facilitates and highlights partners' results....



BOISFEUILLET JONES – ATLANTA CIVIC CENTER Showcase Project: City of Atlanta

LOCATION
Atlanta, GA

PROJECT SIZE
231,000 Square Feet

FINANCIAL OVERVIEW
Project Cost \$2.1 Million

Annual Energy Use (Source EUI)

Baseline (2009)	433 kWh/sq. ft.
Expected (2012)	324 kWh/sq. ft.
Actual (2012)	COMING SOON

Expected Energy Savings: **25%**

Annual Energy Cost

Baseline (2009)	\$500,000
Expected (2012)	\$300,000
Actual (2012)	COMING SOON

Expected Savings: **\$200,000**



BACKGROUND

By revitalizing the Boisfeuillet Jones – Atlanta Civic Center, the City of Atlanta had the opportunity to turn one of its biggest consumers of electricity into an energy-efficient showcase model. The City is expected to save \$200,000 per year and approximately \$3.57 million over the life of the 15-year Georgia SEED (Georgia Sustainable Environmental and Economic Development Program) contract.

[Learn more](#)

SOLUTIONS

Prior to a complete energy overhaul, the Atlanta Civic Center was an all-electric building with electric-resistance heating and domestic hot water. The equipment was unreliable, prone to frequent repairs, and inefficient. While services and equipment upgrades were overdue for the Civic Center, the City also faced capital budget constraints.

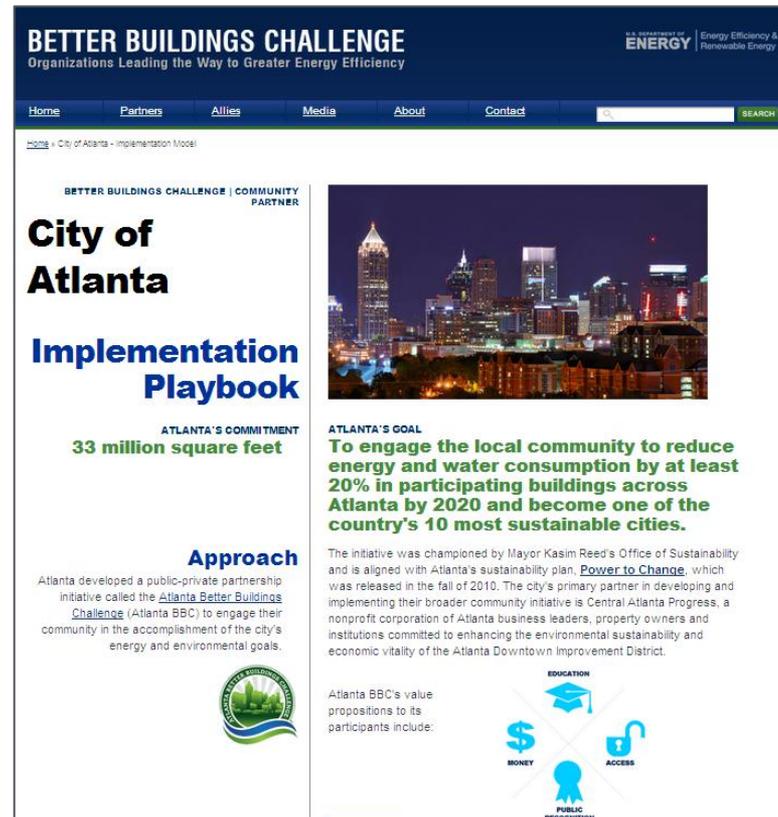
[Learn more](#)

OTHER BENEFITS

Atlanta's flagship energy efficiency project created 89 construction jobs. The energy efficiency upgrades at the Atlanta Civic Center will also deliver significant environmental benefits by reducing annual CO₂ emissions by approximately 2.9 million pounds.

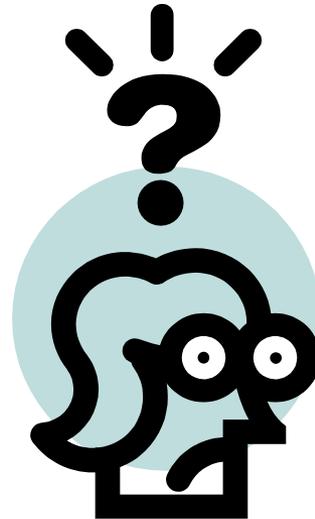
[Learn more](#)

U.S. Department of Energy | [FAQ](#) | [Contacts](#) | [Web Site Policies](#) | [Security & Privacy](#) | [FOIA](#) | [No Fear Act](#) | [USA.gov](#)



... and these serve as cornerstone of comprehensive solution center.

But how do we work with the market to encourage others to replicate those solutions, leading to greater energy savings?



Better Buildings Alliance

Better Buildings

SEARCH

[Search Help](#) ▶



Patrick Corkery, NREL/18596

Installation of night curtains

Whole Foods Market, a BBA member, installed night curtains to cover the refrigerated produce cases when stores are closed. This strategy lowers the cooling load on the refrigeration case by about 40% during unoccupied periods.

BETTER BUILDINGS ALLIANCE SIGN-UP FORM

Building owners and operators can join the Better Buildings Alliance (BBA) by completing the sign-up form.

[SIGN-UP FORM](#)

Join the Better Buildings Alliance

Commercial buildings—our offices, schools, hospitals, restaurants, hotels and stores—consume nearly 20 percent of all energy used in the United States. We spend more than \$200 billion each year to power our country's commercial buildings. Unfortunately, much of this energy and money is wasted: a typical commercial building could save 20 percent on its energy bills simply by commissioning existing systems so they operate as intended. Energy efficiency is a cost effective way to save money, support job growth, reduce pollution, and improve competitiveness.

Through the Better Buildings Alliance, members in different market sectors identify specific barriers and work with the U.S. Department of Energy's (DOE) exceptional network of research and technical experts to develop and deploy innovative, cost-effective, energy-saving solutions that lead to better technologies, more profitable businesses, and better buildings in which we work, shop, eat, stay, and learn.

What does the Better Buildings Alliance do?

Through the Better Buildings Alliance, members in different market sectors identify specific barriers and work with the U.S. Department of Energy's (DOE) to develop and deploy innovative, cost-effective, energy-saving solutions that lead to better technologies, more profitable businesses, and better buildings in which we work, shop, eat, stay, and learn.



Installation of night curtains

Whole Foods Market, a BBA member, installed night curtains to cover the refrigerated produce cases when stores are closed. This strategy lowers the cooling load on the refrigeration case by about 40% during unoccupied periods.

What do we ask of members? What do we provide in return?

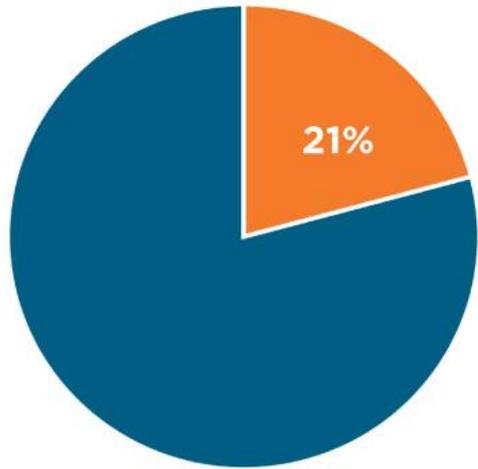


Commitment	Recognition	Support
<ul style="list-style-type: none"> ✓ 20% by 2020 ✓ Transparency ✓ Facility level reporting 	<ul style="list-style-type: none"> ✓ Highest level DOE can confer 	<ul style="list-style-type: none"> ✓ Data ✓ Financing (via financial allies) ✓ Idea exchange ✓ Account management ✓ Plus all Better Buildings Alliance offerings
<ul style="list-style-type: none"> ✓ 2% annual encouraged ✓ Participate in at least 1 activity per year 	<ul style="list-style-type: none"> Available to organizations that join Better Buildings Challenge 	<ul style="list-style-type: none"> ✓ Eligible to participate in pre-defined working groups ✓ Information ✓ Webinars & Events ✓ Peer-to-peer exchange



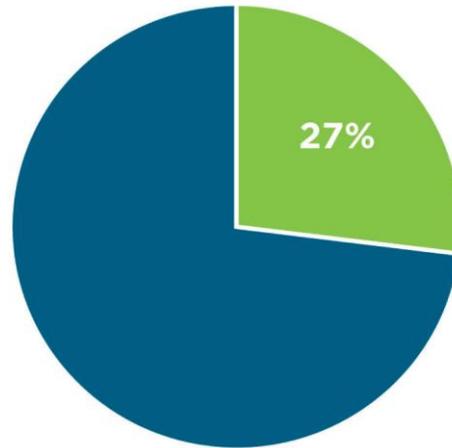
Who is Involved?

>200 member organizations | >500 individual participants | > 9 billion sq ft



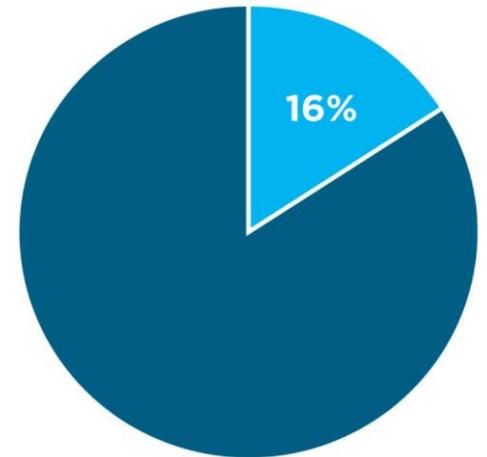
Commercial Real Estate & Hospitality

81 members
6.1 billion sq ft



Healthcare

57 members
0.5 billion sq ft



Retail

58 members
2.4 billion sq ft

Higher Ed – 22 members, 100 million + sq ft

Example Participants



Better Buildings Alliance Structure



Commercial Real Estate



Food Service



Grocery



Healthcare



Hospitality



Higher Education



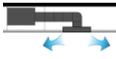
Retail



Public Buildings



Lighting



Space Conditioning



Laboratories



Plug & Process Loads



Refrigeration
Food Service Tech



Energy Information Systems

Technology Solutions



Financing Strategies



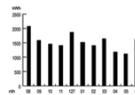
Leasing and Tenant Engagement



Training / Workforce



Appraisals and Valuation

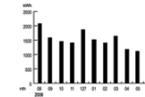


Data Access

Market Solutions



Financing Strategies



Data Management



Strategic Energy Planning



Energy Savings Performance Contracts

Public Sector Solutions

Project Examples

Sample participants and collaborators:



▶ Lighting and Electrical



- [High-efficiency troffer lighting](#)
- [LED site lighting \(parking lot\)](#)
- [High-efficiency parking structure lighting](#)
- [LED refrigerated display case lighting](#)



▶ Plug and Process Loads

- [Low voltage distribution transformers](#)
- [Commercial heat pump water heaters](#)



▶ Space Conditioning

- [Gas heaters](#)
- [Rooftop air conditioning units](#)



▶ Refrigeration

- [Ultra-low temperature freezers](#)



Laboratories

- [Laboratory fume hoods](#)



Helping You Make the Business Case: Commercial Heat Pump Water Heater Example



- ✓ An older, electric resistance water heater operated in a building with a hot water demand of 500 gallons a day, 365 days a year can cost over \$3,500 each year in electricity costs.
- ✓ A new heat pump water heater that meets the specification would use **70% less energy** and could **save \$12,500 over 5 years**.
- ✓ If all commercial electric storage water heaters in the U.S. were replaced with heat pump water heaters per the CBEA specification, businesses would **save 15 TWh of energy**, or about **\$1.5 billion in energy costs per year**.

Lighting Energy Efficiency in Parking (LEEP) Campaign

HOME ABOUT JOIN TECH. AND FINANCIAL ASSISTANCE CASE STUDIES AWARDS AND RESULTS



It's easy to take the LEEP

Join the team
Save electricity and money
Get recognized for success

Join



Technology Solutions Adoption Campaigns

DOE provides tools and technical assistance to Participants in helping to maximize participation. Implementation assistance resources to support technology adoption include:

Case Studies

Cleveland Clinic Goes LED in

CBEA LED Site (Parking Lot) Lighting Specification

The U.S. Department of Energy (DOE), its national laboratories, and Commercial Building Energy Alliance (CBEA) members are working to support the market introduction of light-emitting diode (LED) parking lot lighting. A CBEA Project Team is focused on making reliable, energy-efficient, and competitively priced outdoor

Specifications

IDA High-Efficiency Parking Structure Lighting Specification
 A Green Building Alliance Project
 Version 1.1, Released 1/17/2012

PARKING STRUCTURE LIGHTING PERFORMANCE SPECIFICATION

Parking structures are not high-quality light fixtures and can be the most energy-intensive lighting installation. High-intensity discharge (HID) lighting systems with ballast, induction, and high-pressure sodium (HPS) lighting systems. Each of these high-efficiency systems needs better than HID with controls, such as occupancy sensors and dimmers, to be used. If a fixture, control or system is not suitable, fixture lighting improvements can be made without major structural changes. The intent is to maximize an owner's energy savings.

The U.S. Department of Energy's Commercial Building Energy Alliance (CBEA) identified parking structures as an energy efficiency opportunity in 2011. High-intensity discharge (HID) lighting systems are energy-intensive lighting systems and energy performance. A CBEA Project Team composed of members from the U.S. Department of Energy and national laboratories, with support from the Pacific Northwest National Laboratory, developed a number of specifications that address an overall goal: to provide a high-quality, energy-efficient, and cost-effective lighting system for parking structures. The goal of this specification is to provide a high-quality, energy-efficient, and cost-effective lighting system for parking structures. The goal of this specification is to provide a high-quality, energy-efficient, and cost-effective lighting system for parking structures.

For more information on this and other technical specifications being developed by CBEA members, visit <http://www.commercialenergyalliance.org/technical-specifications>.

PART 1 - GENERAL

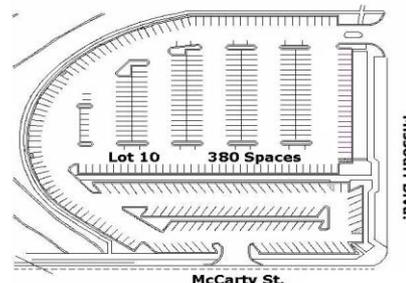
1.1 SUMMARY

The parking structure lighting performance specification is intended to provide adequate illumination for parking structures while being energy-efficient and cost-effective by reducing the amount of power density of lighting fixtures used in the structure to meet minimum energy use. Section is to be specified as follows:

1.2 REFERENCES

- The specifications herein form part of the specifications for the construction of the building as indicated in the IDA by the U.S. Department of Energy.
- Standard National Electrical Code (NEC)
- ANSI CAN/ULC CAN/CSA C100-1000 - Specification, American National Standard for the Construction of Parking Structures
- ANSI CAN/ULC CAN/CSA C100-1000 - American National Standard for the Construction of Parking Structures
- ANSI CAN/ULC - 555, Illuminance (in ASCE development)
- ANSI CAN/ULC-2007 - Part 1 Lamp Ballasts, High-Pressure Fluorescent Lamp Ballast Requirements
- ANSI CAN/ULC-2007 - Illuminance, Minimum Levels - Related Power Quality Requirements for Lighting Equipment

Technical Assistance (limited)



M&V guidance

ENERGY

Exterior Lighting for Energy Savings, Security, and Safety

EE Webinar
November 2009

Pacific Northwest
Lighting, Inc.

List of utility incentives

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

Parking Garage / Parking Lot / Financing

Energy Estimator to compare against code

Lighting Project Evaluator

The Lighting Project Evaluator allows you to estimate the energy savings of a new lighting system against a specified energy code. This tool can also compare proposed lighting upgrades to your existing conditions.

The tool can also determine your eligibility in receiving the 179D Tax Deduction. Just sign in and create an Energy Estimate to get instant feedback.

Log In Don't have an account? [Sign up now!](#)

email password

Sign In

Forgotten your password?

Organizer-hosted Webinars

LEEP Campaign

Take the LEEP - An Introduction to the Lighting Energy Efficiency in Parking Campaign

Photo Courtesy of Green Building, Providence, RI, USA, LLC

BOMA **Green Building Alliance** **IPMA** **Commercial Building Energy Alliance**

Sample participants & stakeholders:



- BBA worked with GSA, NYU, RMI, BOMA, NRDC, IMT, and others to help launch content and resources in the [Green Lease Library](#)
- Successfully published two case studies focused on overcoming barriers to green leasing
 - [Brandywine Realty Trust](#)
 - [Pyramid Companies](#)



Target participants:



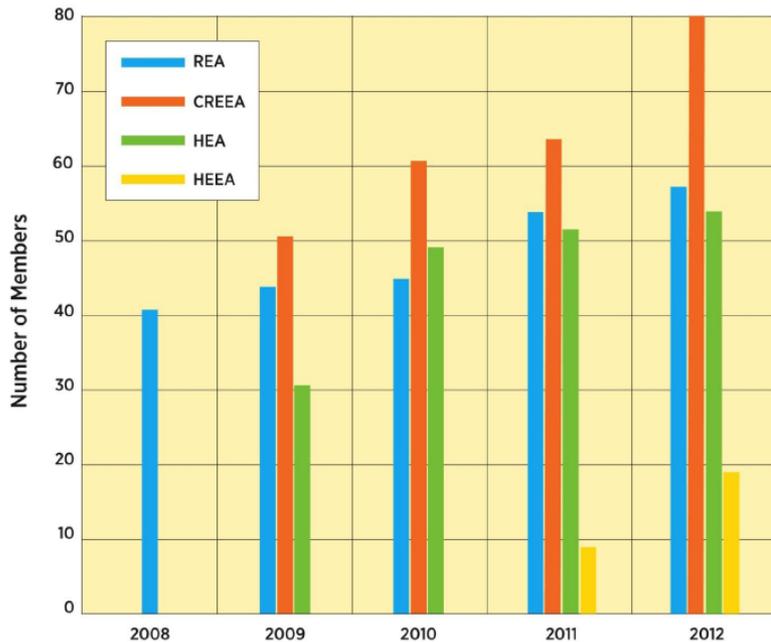
✓ K-12

✓ Local government

✓ State government



- **Four new Project Teams designed to equip public sector organizations with technical assistance, support materials, and peer networks.**
 - **Energy Savings Performance Contracts (ESPC)**
Meeting Dates: March 2013 - December 2013
Outcome: Develop an energy services agreement framework along with recommended task list for high performing contracts.
 - **Community Strategic Energy Planning**
Meeting Dates: April 2013 - December 2013
Outcome: Fully developed strategic energy plan framework
 - **Finance Strategies**
Meeting Dates: April 2013 - December 2013
Outcome: Strategy for financing a portfolio of public projects
 - **Data Management Approaches**
Meeting Dates: March 2013 - December 2013
Outcome: Harness building energy data for greater energy efficiency impact
- **Organized to help public entities design and produce tangible, deployable resources tailored to their communities.**
- **Second annual Better Buildings Summit for State and Local Communities, May 30-31, in Washington, DC.**



“These have been two of the most relevant, useful days I have spent this year.”

- Noah Shlaes
Senior Managing Director, Global Client Services
Newmark Grubb Knight Frank, on 2012 Alliance
Efficiency Forum

Active engagement with the commercial market:

- 220 organizations and over 500 individual members representing over 9 billion sq feet; up from 164 members same time last year
- On track to meet targets of Increase membership to over 250 members representing over 9.5 billion sq. feet by end of FY 13
- Key progress and member milestones will be recognized at 2013 Efficiency Forum May 29-30 in Golden Colorado; opportunity for engagement



Advancing innovative technology:

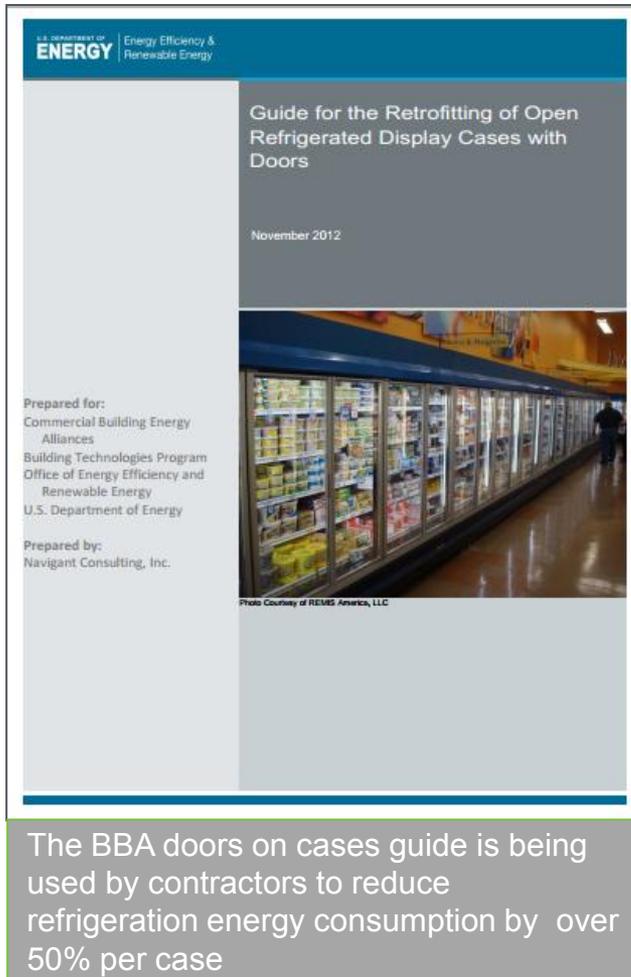
- Five manufacturers participating in RTU challenge, a \$1b savings opportunity
- Released **five new specifications** this past fall, doubling the number of Alliance specifications
- Nationwide, if everyone switched to technologies that meet these specs, we could save over **\$5.5 billion annually**
- On track to launch new campaigns driving greater adoption of technologies meeting specifications
 - Highly efficient lighting (LEEP)
 - High efficiency space conditioning (RTU)
- Lighting specifications alone represent a **100 TWh savings** opportunity, specs are becoming standard used by market leaders (Walmart, DoD)



Walmart is using lighting specifications in their parking lots to save significant energy.

Leveraging private sector funds-examples:

- ~\$250k investment in outdoor lighting specification development has led to manufacturer improvements and energy savings of over **\$60 million** per year in member sites alone
- ~\$400k investment in RTU specification development and demonstrations have led to multiple **millions of private sector investment** in development of better technology

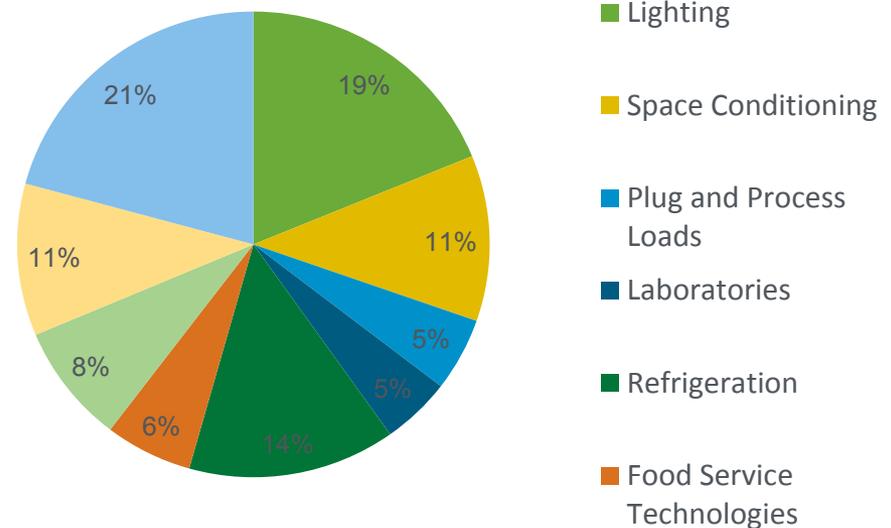


Overcoming market and technical barriers:

- Inability to benchmark restaurants due to lack of data
 - ✓ Working collaboratively with Energy Star and food service members to address
- Hesitancy to try energy-aligned leases due to lack of information/ examples
 - ✓ Green Lease Library and case studies
- Improper refrigeration system installation & commissioning and lack of doors on conditioned display cases
 - ✓ Providing guidance to help move the market; participating in guide development with ASHRAE
- Inexperienced operators, workforce
 - ✓ Members testing out “retuning training” and were fundamental to Job Task Analysis development that are at the core of DOE’s training certification efforts

Budget Categories	FY '13 Budget
Coordination and Logistics	\$ 750,000
Project Teams	\$ 3,343,000
Lighting	\$ 629,000
Space Conditioning	\$ 385,000
Plug and Process Loads	\$ 170,000
Laboratories	\$ 159,000
Refrigeration	\$ 475,000
Food Service Technologies	\$ 200,000
Energy Information Systems	\$ 277,000
Market Solutions	\$ 353,000
Cross-cutting	\$ 695,000
Total:	\$ 4,093,000

Project Team Break Down



Budget History

FY2011 - \$5 million

FY2012 - \$2.5 million

FY2013 - \$4 million

FY 2013

200 partners
9 billion sq. ft.

- Announce BBA
- Rebrand CBEA
- Scope role for utility, service provider and supplier contact groups
- Scope multifamily addition to BBA
- Add 3 technical or market solutions such as:
 - Data centers
 - EMIS
 - Leasing

FY 2014

300 partners
10 billion sq. ft.

- Add multifamily to BBA
- Formalize role of utility, service and supplier contact groups
- Scope expansions to AE&C
- Add 2-3 technical or market solutions teams, at least one of which focuses on multifamily
- W/partners, expand benchmarking for at least one new sector (restaurants)

FY 2015 +

500 partners
15 billion sq. ft.

- Formalize AE&C deployment role
- Add 2-3 technical or market solutions projects, at least one of which focuses on AE&C
- W/partners, expand benchmarking for at least one new sector (e.g. malls)
- Continue working with market leaders to drive change while codes and standards encourage laggards to act

Retrofitting Doors on Refrigerated Display Cases --BBA Technology Solutions/Refrigeration

Lighting Energy Efficiency in Parking Campaign --BBA Technology Solutions/Lighting

RTU Campaign--BBA Technology Solutions/Space Conditioning

Technology Specification Deployment --BBA Technology Solutions

Kristen Taddonio – Commercial

Kristen.Taddonio@ee.doe.gov

202-287-1432

Michelle Wyman – Public Sector

Michelle.Wyman@ee.doe.gov

202-287-5980

BETTER BUILDINGS ALLIANCE SIGN-UP FORM

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SIGN-UP FORM

BetterBuildings.energy.gov

Questions?

