Better Buildings
U.S. DEPARTMENT OF ENERGY

BETTER BUILDINGS ALLIANCE

2013 Annual Report

U.S. DEPARTMENT OF ENERGY

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Executive Summary

The U.S. spends about $200 billion annually just to power commercial buildings—and about another $200 billion to power manufacturing facilities.[1] Due to inefficient design, materials, equipment, and operations, 20% or more of the energy used to power buildings is wasted. The U.S. can significantly cut down on this waste by employing the fastest, cheapest, cleanest energy resource: energy efficiency. Reducing this waste means not only the potential to save more than $80 billion per year on energy bills, but also to create well-paying jobs.

There are many barriers to greater energy efficiency. Historically, building owners and operators have not prioritized energy efficiency as a major cost-saving measure or integrated it into business planning. Many organizations lack senior management support, do not have access to objective information, and cannot find skilled workers that have appropriate training. The list of barriers goes on. That is where the Better Buildings Initiative fits in.

The Better Buildings Alliance's Role in the Better Buildings Initiative

Launched by President Obama with the assistance of his Council on Jobs and Competitiveness and with President Clinton, Better Buildings is a broad initiative with a goal of reducing energy intensity in the commercial, industrial and residential sectors by 20% over the next ten years through effective use of tax incentives, financing, corporate leadership, state and local policies, workforce development, and efforts to deliver better information to the marketplace.

Through the Better Buildings Initiative, the U.S. Department of Energy (DOE) is currently pursuing strategies within four pillars to catalyze change and accelerate investment in energy efficiency. These pillars include:

- Pillar 1: Developing Innovative, Replicable Solutions with Market Partners
- Pillar 2: Making Energy Efficiency Investment Easier
- Pillar 3: Developing a Skilled Clean Energy Workforce
- Pillar 4: Federal Leadership by Example

The Better Buildings Alliance and the Better Buildings Challenge are the cornerstone of the DOE's efforts to develop innovative, replicable solutions with market partners. Participating organizations lead their industry sectors in providing concrete steps to unlocking savings from energy efficiency, substantiated with data-based results from their efforts.

Since 2008, the DOE has been working with interested stakeholders to share knowledge and take action to make commercial buildings more energy efficient through the Better Buildings Alliance. Better Buildings Alliance members are required to share an energy savings goal when they sign up. DOE encourages Better Buildings Alliance members to set a goal of 2% or greater per year. Better Buildings Alliance members also agree to participate in at least one Alliance activity each year and share their successes with their peers.

The Better Buildings Challenge, formally launched by President Obama and President Clinton in December 2011, now has more than 170 Partners, representing more than 3 billion square feet of building space and more than 300 manufacturing facilities. These partners formally commit to 20% energy savings over 10 years and increased transparency. Better Buildings Alliance members who join the Better Buildings Challenge are eligible for top-level recognition for participating, sharing data, developing replicable models to share with industry partners, and meeting their goals.

Better Buildings Challenge and Better Buildings Alliance members represent an impressive array of leaders from a broad range of sectors including commercial building owners, schools, hotels, hospitals, retailers, manufacturers, utilities, and city and state governments.

Participation

As of 2013, more than 200 Better Buildings Alliance members represent over 10 billion square feet of commercial building space. Members include:

- Public sector members from states, local governments and public schools.
- Private sector members from the commercial real estate, hospitality, retail, food service, grocery, healthcare, and higher education sectors.

Teams

Members choose from a variety of program activities with the option to participate in 15 solutions teams. Members have the option to test out an implementation model, join a technology adoption campaign, or participate in a technology challenge or demonstration. The Better Buildings Alliance solutions teams include:

- Technology Solutions Teams: Lighting & Electrical, Space Conditioning, Plug & Process Loads, Food Service, Refrigeration, Laboratories, and Energy Management Information Systems.
- Market Solutions Teams: Financing & Valuation, Leasing & Split Incentive, Data Access, and Workforce Development.
- Public Sector Solutions Teams: Data Management, Energy Savings Performance Contracts, Finance Strategies, and Strategic Energy Planning.

2013 Program Highlights

- In 2013, the Better Buildings Alliance members' combined portfolios totaled over 10 billion square feet for the first time—or one-seventh of the U.S. commercial building sector.
- Better Buildings Alliance members made significant progress saving energy in their portfolios. On average, members reported savings of 2% over the previous year's energy use.[2]
- Participation in the 15 solutions teams grew by over 75%, with more members than ever that are actively pursuing energy savings solutions.
- The Better Buildings Alliance released three new technical specifications in 2013. If widely implemented, these specifications could reduce energy use by over 500 trillion British thermal units (Btu) per year and save more than $5 billion.
- To date, the Better Buildings Alliance has issued two technology challenges, two technology adoption campaigns, and ten procurement specifications to help companies select efficient heating, cooling, lighting, refrigeration, and water heating technologies. If everyone switched today to technologies that meet these specifications, commercial building owners and managers would save over 2.0 quads of source energy every year,[3] equal to about 12% of commercial sector energy use.[1]

Join Us

DOE welcomes building owners, managers, and operators to join the Better Buildings Alliance. Join today at eere.energy.gov/betterbuildingsalliance/join.

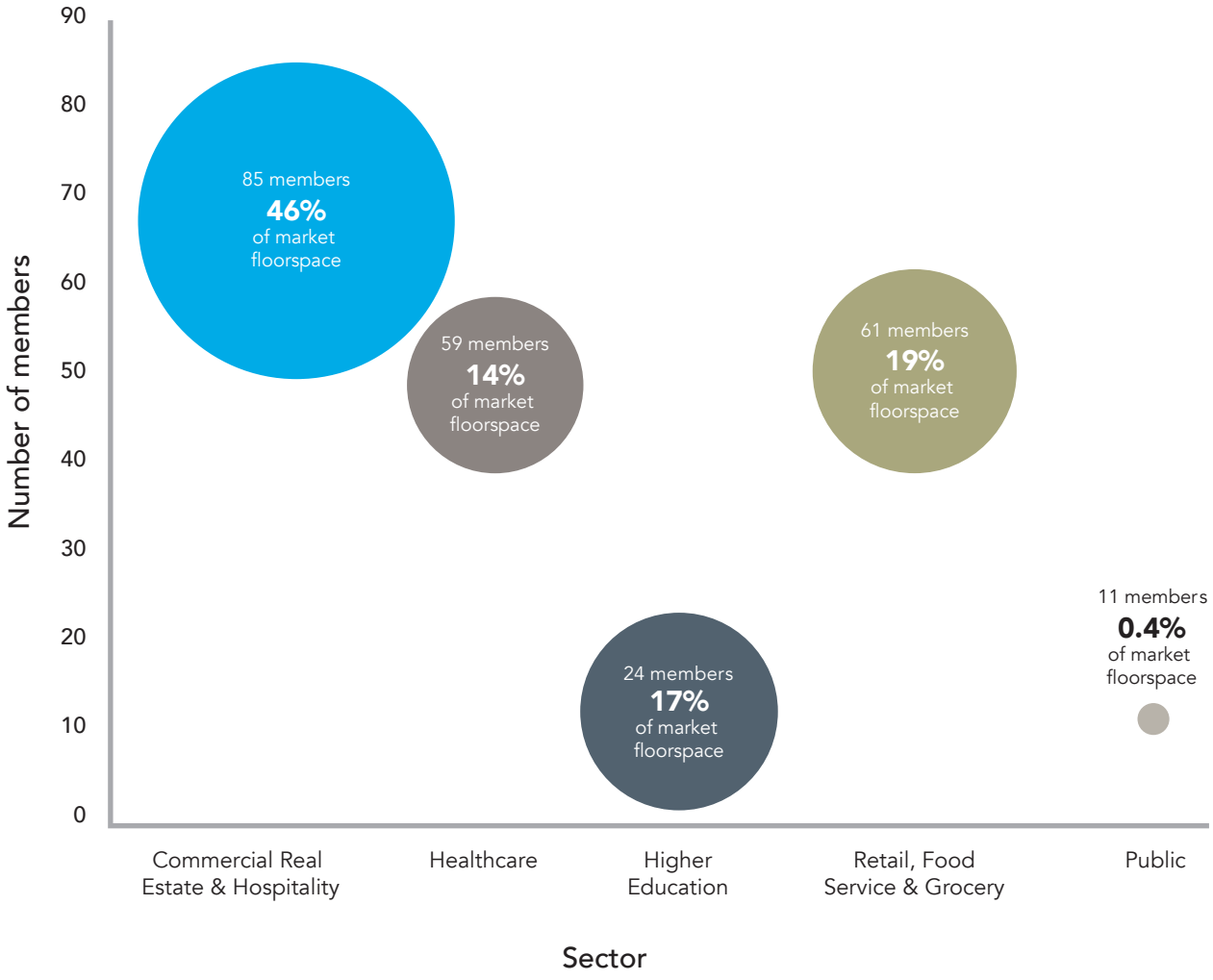
Introduction

This report provides detailed information on the activities of the Better Buildings Alliance program for the year 2013. Solutions developed by Better Buildings Alliance teams are helping to steer the U.S. commercial building energy efficiency market and improve the competitiveness and stability of American companies, organizations, and higher education institutions.

The 2013 Better Buildings Alliance Annual Report highlights the accomplishments of the program over the past year, and showcases its continued growth across four program areas: Sector Teams, Technology Solutions Teams, Market Solutions Teams, and Public Sector Solutions Teams.

Each section includes a program overview, summaries of major achievements, descriptions of new resources, and an overview of planned activities for the coming year. In the Sector Teams sections, the Better Buildings Alliance recognizes members for their leadership in program activities and sharing their efforts towards achieving energy reductions.

Figure 1. Number of Members and Percent of Market Floorspace[5]



WORKING TO MEET THE NEEDS OF DIVERSE MARKET SECTORS

SECTOR TEAMS

COMMERCIAL REAL ESTATE & HOSPITALITY

HEALTHCARE

HIGHER EDUCATION

RETAIL, FOOD SERVICE & GROCERY

PUBLIC SECTOR

Sector Teams

Members in five public and private sector groups work with DOE's exceptional network of research and technical experts to develop and deploy innovative, cost-effective, energy-saving solutions. Activities support State Government, Local Government, and K–12 schools as well as Commercial Real Estate & Hospitality, Healthcare, Higher Education, Retail, and Food Service & Grocery.

2013 HIGHLIGHTS

- Introduced new Public Sector Team and welcomed the first State, Local, and K–12 members.
- Grew the Commercial Real Estate, Hospitality, Retail, and Food Service membership to nearly 7 billion square feet.
- Initiated sector-specific activity options for Healthcare and Higher Education members to supplement Technical and Market Solutions Teams' offerings.

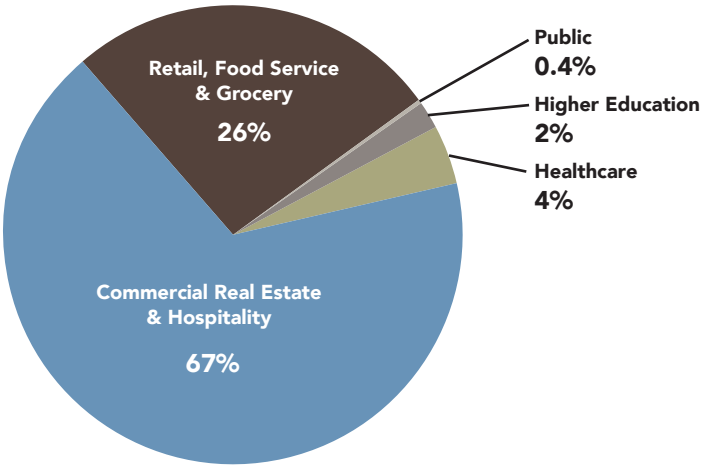
WHAT TO EXPECT IN 2014

- Expanded membership opportunities including new options for trade associations.
- New group catering to commercial tenants' energy efficiency needs.

Figure 2. Portfolio Size by Market Sector

Smallest	Sector	Largest
26,000 sq. ft.	Commercial Real Estate	1.3 billion sq. ft.
63,000 sq. ft.	Retail and Food Service	730 million sq. ft.
220,000 sq. ft.	Healthcare	150 million sq. ft.
15,000 sq. ft.	Hospitality	280 million sq. ft.
490,000 sq. ft.	Higher Education	59 million sq. ft.
460,000 sq. ft.	Public	14 million sq. ft.

Figure 3. Member Floorspace in Better Buildings Alliance



Commercial Real Estate & Hospitality

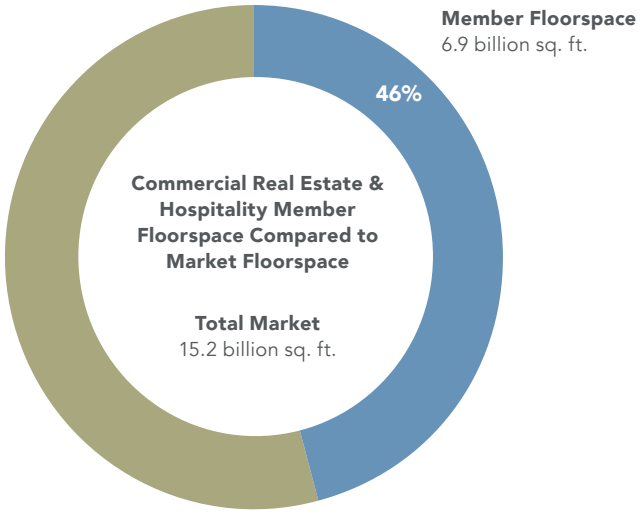
Buildings in the U.S. commercial real estate and hospitality sector account for more than 20% of commercial building energy use and collectively spend more than $30 billion on energy every year.[4] Energy consumption typically comprises a property's single largest operating expense, representing up to 30% of an average building's costs. Controlling this expense through energy efficiency improvements and operational best practices could have a drastic impact on the bottom line. For example, a 10% reduction in energy use in a 200,000 square foot office building with energy costs of $2 per square foot and a capitalization rate of 7% could result in an increased asset value of more than $570,000.[6, 7] In hotel properties, a 10% reduction in energy use is equivalent to an increase in revenue per available room (RevPAR) of $0.60 for limited service hotels and more than $2.00 for full-service hotels.[8] Despite key challenges such as split incentives, short payback requirements, and navigating complex owner/manager/franchisee relationships, this sector holds tremendous opportunities to capitalize on proven best practices in energy efficiency.

Over the past year, the Commercial Real Estate & Hospitality sector of the Better Buildings Alliance has grown to include over 70 members who own, lease, or manage over 6.9 billion square feet of space. Members engage with experts from the Market Solutions Teams and Technology Solutions Teams to tackle topics such as improving the efficiency of parking lot lighting and laundry facilities, acquiring energy consumption data from tenants and utilities, and driving the adoption of green leasing. In the next year, sector members will build upon these successes and work together on additional topics such as real-time energy monitoring and deep energy retrofits. These projects help industry members realize valuable savings, sometimes 20% or more, while also benefiting from increased growth in net operating income, overall property value and enhanced public perception as organizations committed to corporate environmental sustainability.

"Integrating environmentally responsible practices throughout our operations has been a key pillar in MGM Resorts' strategic sustainability plan."

– Jim Murren,
Chairman and CEO of MGM Resorts International

Figure 4. Member Floorspace Compared to Market



Member in Action: MGM Resorts International

MGM Resorts has made great strides in reducing its energy and resource consumption. Over the past 5 years, the company has reduced its energy intensity by more than 12% and saved more than 2.5 billion gallons of water. Now, MGM is working with NRG Energy to install one of the largest rooftop photovoltaic arrays in the world on the Mandalay Bay in Las Vegas. This 6.2-megawatt system will generate enough electricity to power the equivalent of 1,000 homes. "Integrating environmentally responsible practices throughout our operations has been a key pillar in MGM Resorts' strategic sustainability plan," said Jim Murren, Chairman and CEO of MGM Resorts International.

Chris Magee, MGM's Director of Sustainable Facilities Development, is co-chair of the Commercial Real Estate & Hospitality Steering Committee and an active member of the Lighting & Electrical Team.

MGM Resorts and NRG Energy are developing Mandalay Bay Solar Array, one of the largest contiguous rooftop solar photovoltaic arrays in the world. This 6.2-megawatt installation in Las Vegas, Nevada will be MGM Resorts' first commercial solar project in the U.S.

Member in Action: Kimco Realty

Recognizing that energy accounts for significant operating costs, Kimco Realty launched its Corporate Responsibility Program in 2010 as a way to mitigate costs and meet the growing expectations of industry stakeholders.

Since then, Kimco has collected data on its facilities' energy use and made improvements to building controls and common areas. Some of these improvements, such as high-efficiency lighting for parking lots, saved properties as much as 60% in energy costs.

However, Kimco considers tenant spaces to be the largest opportunity for gains in energy efficiency. Kimco's data shows that tenants controlled up to 85% of energy use in retail properties. With this in mind, Kimco is piloting a tenant efficiency improvement project at the Westlake Shopping Center in Daly City, CA. This project, supported by Pacific Gas and Electric Company (PG&E), will identify energy-efficient improvements to leased retail spaces and result in improved business models that encourage landlord and tenant adoption of efficiency measures. Kimco also joined the Green Leasing steering committee, formed under the Better Buildings Alliance Market Solutions Teams, to identify how leases can be structured to aid landlords and tenants in achieving energy savings goals. Learn more about leasing and tenant engagement activities on page 48.

Westlake Shopping Center in Daly City, California serves as the pilot site for Kimco Realty's tenant energy efficiency initiative. The 686,000 square foot center was selected because of its location within PG&E's service territory, the diverse range of retail tenants at the property, and the efficiency solutions actively implemented at the property.

Members

Atsite
Bank of America
Big Rock Partners
Calvert Group
Cassidy Turley
CBRE
CC Frost Properties
Colliers International
Community Services Agency & Development Corporation
Core Properties
Corporate Office Properties Trust
Cox Communications
Cushman & Wakefield
Dacra Development
Denver West
Edens & Avant
First Potomac Realty Trust
Forest City Enterprises, Inc.
GE Capital Real Estate
Glenborough
Green Leaf Inn
H&R Block
HAL Real Estate Investments
Hilton Worldwide
Hines
Hyatt Hotels
IBM
InterContinental Hotels Group
Jones Lang LaSalle
Kilroy Realty
Kimco Realty
Liberty Property Trust
Living City Block
Marriott International
Mesa Lane Partners
MGM Resorts International
New York Times Company
Newmark Grubb Knight Frank Global Corporate Services
Opus
Parmenter Realty Partners
Prologis
Prudential Financial
Regency Centers
Rosemont Realty
RREEF Real Estate
Ryan Companies US
Schaad Companies
Sharpe Properties Group, LLC
Simon Property Group, Inc.
Southbrook Church
Stream Realty Partners, L.P.
Studley
Sunset Development Company
The JBG Companies
The Malcolm Bryant Corp.
The PNC Financial Services Group
The Related Companies, L.P.
The Walt Disney Co.
The Westfield Group
Tishman Speyer Properties
Transwestern
Twentieth Century Fox Film Corp.
USAA Real Estate Company
U.S. Department of Energy
U.S. General Services Administration
U.S. Navy CNIC Facilities and Acquisitions
Vornado Realty Trust
Webster Development, LLC
Winstanley Enterprises
Wright Runstad & Co.
Wyndham Worldwide

Affiliated Organizations:

American Hotel & Lodging Association
American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
BOMA International
Green Parking Council
Green Sports Alliance
Illuminating Engineering Society of North America (IES)
International Facility Management Association (IFMA)
International Council of Shopping Centers
NAIOP (Commercial Real Estate Development Association)
National Association of Real Estate Investment Trusts (NAREIT)
National Multi Housing Council
Sustainability Roundtable Inc.
The Bullitt Foundation
The Real Estate Roundtable

Members in **bold** have taken the Better Buildings Challenge

Healthcare

Hospitals and other healthcare facilities are among the most energy-intensive buildings in the country, spending more than $9 billion on energy every year.[4] According to the U.S. Energy Information Administration, U.S. healthcare facilities are the third most energy-intensive facility type across the nation; only buildings used for food service and food sales use more energy per square foot.[4] With increasing costs and tighter budgets, many healthcare facilities are seeking ways to cut costs without compromising the quality of patient care. Energy efficiency improvements present one such opportunity.

Over the past year, the Better Buildings Alliance healthcare members have implemented technologies and operational practices to increase the energy efficiency of their facilities. These healthcare organizations are focusing on energy efficiency as a win-win solution to improve facilities, reduce environmental impacts, and save healthcare systems needed resources—resources that can be used to hire staff, invest in medical equipment, and improve patient experience. The Better Buildings Alliance healthcare sector members represent about 0.5 billion square feet of space, 14% of the sector.

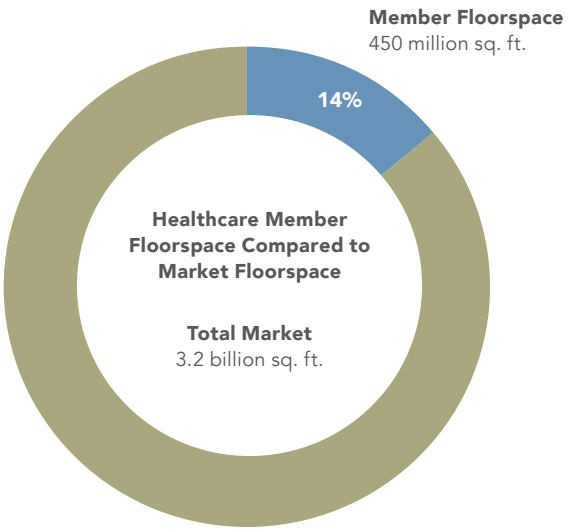
The Better Buildings Alliance provides information, tools, and resources to help make healthcare buildings more efficient. Focus areas for Healthcare members in 2014 include:

- Documenting efficiency investment successes with healthcare organization CFOs. The Better Buildings Alliance is teaming with Practice Greenhealth to work with CFOs and CEOs and to develop case studies that provide compelling examples of strategic energy efficiency investments.
- Hosting healthcare peer exchange opportunities and supporting participation in new technical initiatives such as the Energy Management Information Systems Team projects.

"This program has more win-win opportunities than anything else in this space."

– John D'Angelo,
VP Facilities Operations
New York-Presbyterian Hospital

Figure 5. Member Floorspace Compared to Market



Member in Action: Ascension Health

A longtime Better Buildings Alliance member, Ascension Health, was among the first hospitals nationwide to join the Better Buildings Challenge. Ascension has set a goal to achieve a 20% energy reduction by 2020 from 2008 levels. They achieved system-wide saving of over 9.1%, reducing energy costs by nearly $30 million between 2008 and 2013. These savings were possible due to Ascension Health's ability to implement energy efficiency projects using dedicated capital funds from its Facilities Infrastructure Pool (FIP). The FIP provides capital for energy efficiency and system maintenance, addressing a common problem in healthcare where organizations defer energy-saving upgrades in favor of clinical upgrades competing for the same funds. Ascension Health worked with DOE to document its Facilities Infrastructure Pool in a Better Buildings Challenge Implementation Model so that other hospitals in the Better Buildings Alliance and beyond can learn from their success. View the Implementation Model online at www4.eere.energy.gov/challenge/implementation-model/ascension-health.

Ascension Health is the nation's largest Catholic and nonprofit health system with 71 care facilities across 23 states and the District of Columbia. By the end of 2012, they achieved system-wide saving of over 11%, reducing energy costs by nearly $19 million.

Member in Action: New York-Presbyterian Hospital

Since 2009, New York-Presbyterian Hospital has reduced its energy consumption by over 400 billion Btu or about 13% across the system. To help achieve these savings, New York-Presbyterian has utilized several Lighting & Electrical Team resources to make upgrades, including the Wall Pack Specification & Guidance and the High-Efficiency Troffer Specification for selecting lighting products. Learn more about these specifications and the energy savings your organization can achieve with them on the Lighting & Electrical Team web page at eere.energy.gov/betterbuildingsalliance/lighting.

"The work of the Better Buildings Alliance is moving the energy efficiency and sustainability needle in a unique way. By allowing members to share innovations not only within their own but across industries, adoption of products and ideas has been accelerated…The Better Buildings Alliance members, including DOE, represent such a significant purchasing block that manufacturers take notice and pay careful attention to our focus areas in their own product development and innovations. This program has more win-win opportunities than anything else in this space."

– John D'Angelo, VP Facilities Operations, New York-Presbyterian Hospital

New York-Presbyterian Hospital (NYP), based in New York City, is one of the nation's largest and most comprehensive hospitals, with some 2,600 beds. Since 2009, New York-Presbyterian Hospital has reduced its energy consumption by over 400 billion Btu or about 13% across the system.

Members

Adventist HealthCare
Advocate Trinity Hospital
A.O. Fox Memorial Hospital
Ascension Health
Beaumont Health System
Bon Secours St. Francis Health System
Boulder Community Hospital
Broward Health North
Catholic Health Initiatives (CHI)
CentraCare Health System
Clarion Hospital
Cleveland Clinic
Dartmouth-Hitchcock Medical Center
Dignity Health
Geisinger Health System
Gundersen Lutheran Health System
Hackensack University Medical Center
Health Care REIT
HealthSouth
Hospital Corporation of America
IASIS Healthcare
Inova Health System
James J. Peters VA Medical Center
Johns Hopkins Health System
Jones Lang LaSalle
Kaiser Permanente
Lake Health
Legacy Health System
Mayo Clinic
Metro Health Hospital
New York-Presbyterian Hospital
North Shore-Long Island Jewish Health System
Palomar Pomerado Health
Partners HealthCare
PeaceHealth
Providence Health & Services
Rush University Medical Center
San Luis Valley Regional Medical Center
Sinai Health System
St. Mary's Medical Center
Southwestern Vermont Medical Center
Summa Health System
Texas Children's Hospital
Texas Medical Center Central Heating and Cooling Services Corporation (TECO)
TRICARE Management Activity (TMA)
University of Maryland Medical Center
University of Pittsburgh Medical Center
University of South Alabama Medical Center
University of Vermont Medical Center
U.S. Department of Veterans Affairs
U.S. General Services Administration
Veterans Health Administration
West Chester Medical Center
Yale-New Haven Hospital

Affiliated Organizations:

American Society for Healthcare Engineering (ASHE)
American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
Health Care Without Harm
Illuminating Engineering Society of North America (IES)
International Facility Management Association (IFMA)
VHA, Inc. (formerly Voluntary Hospitals of America)

Members in **bold** have taken the Better Buildings Challenge

Higher Education

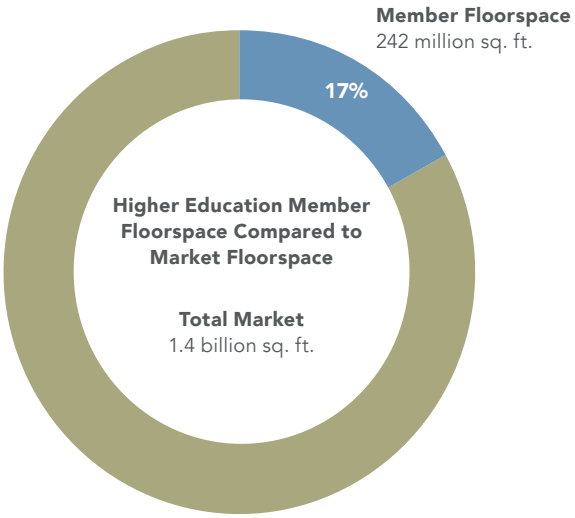
Over the past year, the Better Buildings Alliance's higher education members have made great strides in improving the efficiency of their operations. The higher education sector represents almost 1.5 billion square feet of building space.[4] Each year, the nation's higher education sector spends nearly $4 billion in energy costs[10] – the equivalent of tuition for about 200 thousand students.[11]

Colleges, universities, and other post-secondary institutions across the United States hold a unique position as thought leaders, innovators, and educators of the next generation's leaders. The higher education sector enrolls 20 million students (over 6% of the U.S. population) every year, and 57% of adults over the age of 25 have received some college education.[12] The sector therefore represents an opportunity to drive progress on energy efficiency by demonstrating leadership, deploying innovative technologies, and equipping future professionals with the skills to make efficiency happen.

At the same time, higher education faces an array of barriers to energy efficiency—including accessing low-cost capital, engaging busy stakeholders around energy conservation, reducing consumption in energy-intensive laboratory buildings, and attracting top-tier technical staff. Higher education sector members are dedicated to overcoming these barriers with innovative strategies and technologies. They are demonstrating that proven energy efficiency measures represent a unique opportunity to reduce annual energy spend, protect against cost volatility, and exhibit environmental leadership within the sector and beyond. Higher education sector members have identified three key focus areas for the upcoming year:

- Connections to Impact Finance: Many higher education institutions struggle to obtain low-cost capital for energy efficiency. Over the next year, the Better Buildings Alliance will highlight ways that members have successfully located sources of impact financing – including foundations, social impact investors, program-related investments, and other models.
- Green Revolving Funds: Green revolving funds present an opportunity to build the business case for energy efficiency by tracking and repaying savings back into the fund. The Better Buildings Alliance will work with members to share best practices for developing and managing these funds.
- Overcoming Balance Sheet Restrictions: Many institutions face restrictions on the type and amount of debt they can take on for efficiency projects. The Better Buildings Alliance will provide a forum for members to share creative ways to solve this barrier.

Figure 6. Member Floorspace Compared to Market



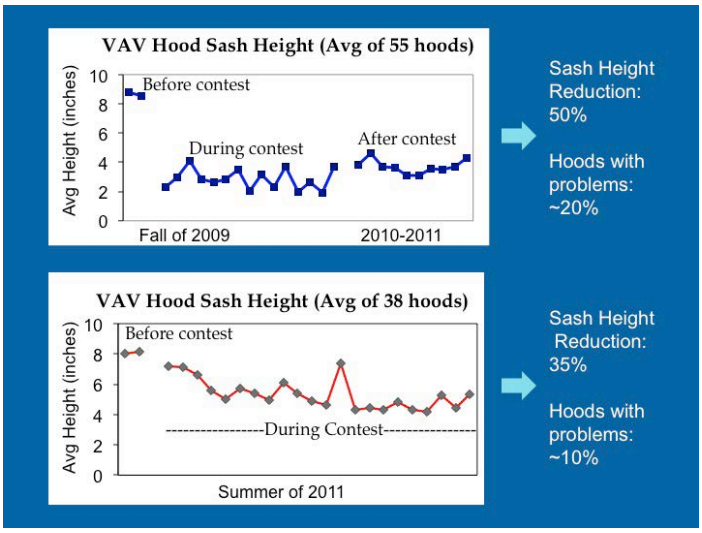
Member in Action: CU Boulder

The University of Colorado, Boulder (CU Boulder) is actively engaging laboratory users around energy efficiency with its Green Labs program. Green Labs was founded in 2009 as a voluntary program designed to encourage scientists to conserve energy. The focus of the program is on increasing collaboration and communication by bringing diverse groups to the table— including the environmental health and safety (EHS) department, facilities department, and the campus environmental center in addition to lab users themselves. Ideas for conservation can come from any of these entities.

The backbone of the program is lab Eco-Leaders, insiders from within the university's 400 labs who are knowledgeable about the unique equipment in their respective facilities. Eco-Leaders serve as advocates for efficiency and liaisons with the broader program. The program serves three key roles.

- Informing and educating lab users about best practices in energy management.
- Holding competitions between labs and publicizing the success of the most efficient labs.
- Providing resources to lab users including help with freezer failures, equipment disposal and sharing, and information on funding and incentive sources.

In 2013, the Eco-Leaders assisted in setting 60% of ultra-low temperature freezers on campus to -70°C from -80°C. This saved about 250 kilowatt hours a day, the equivalent of taking approximately 10 houses off the grid. Savings estimations do not include heating, ventilation, and air conditioning savings resulting from reduced heat rejection into building space by freezers. Through the Better Buildings Alliance, CU Boulder is helping other higher education members learn from and replicate this successful strategy to achieve energy savings in labs.



Results from two Just Shut It campaigns at CU Boulder. The initial contest in 2009 led to a 50% reduction in average sash height. However, a second contest run in 2011 targeting the same labs was still able to produce a 35% reduction in average sash height, showing that continuous occupant engagement is valuable.

CU Boulder's "Just Shut It" sticker from their Just Shut It Campaign. These stickers and other educational materials are posted in laboratories by Eco-Leaders, a network of student volunteers representing 140 laboratories across campus. As laboratory occupants, Eco-Leaders serve as advocates, implementers, and liaisons for efficiency in laboratories by connecting day-to-day lab operations with the CU Green Labs program.

Members

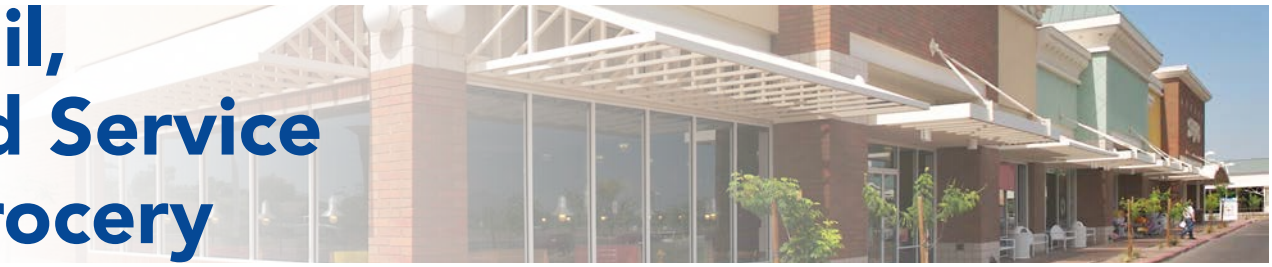
Arizona State University
Clark Atlanta University
Cornell University
Duke University
Grand Valley State University
Loyola University
Massachusetts Institute of Technology
Portland State University
San Mateo Community College District
Stanford University
Tulane University
University of California, Berkeley
University of California, Davis
University of California, Irvine
University of California, Merced
University of Colorado, Boulder
University of Hawaii at Manoa
University of Maryland
University of South Carolina
University of Utah
University of Wisconsin
Washtenaw Community College

Affiliated Organizations:

Energy Efficiency Building Hub (EEB Hub)
Second Nature

Members in **bold** have taken the Better Buildings Challenge

Retail, Food Service & Grocery



Commercial buildings across the U.S. retail, food service, and grocery sectors collectively spend more than $42 billion on energy each year. Retail buildings (including stand-alone stores, malls, and shopping centers) make up nearly 16% of commercial building space nationwide and spend more than $27 billion dollars on energy each year. Operations dedicated to food sales and food service represent another 4% of commercial buildings space and spend more than $15 billion on energy each year.[4] Relatively minor equipment upgrades and other energy efficiency improvements can lead to significant savings, bolstering profit margins for businesses of all sizes.

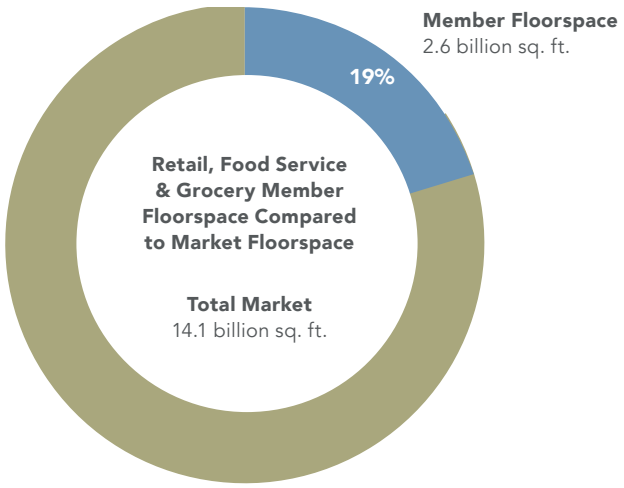
While representing a smaller portion of all U.S. buildings, facilities with commercial kitchens consume roughly 5–7 times more energy per square foot than other commercial buildings—and high volume quick-service restaurants may use up to 10 times more.[14, 15] In fact, a single commercial kitchen appliance can consume more than an average U.S. home. A typical electric fryer uses more than 18,000 kWh annually while the average U.S. household uses about 11,000 kWh of electricity annually.[16, 17] Utility costs typically range between 3%–4% of operating costs for restaurants, but rising energy costs directly cut into operator profits. For example, demand control ventilation (DCV) for commercial kitchens can offer annual savings around $1,500 for limited-service restaurants. For a restaurant operating with a profit margin of around 3.5% (the industry average), it will need to make roughly $45,000 in sales to earn that $1,500 in profit.[18]

The Better Buildings Alliance connects retail, food service, and grocery members with an experienced network of energy experts to provide information, tools, and resources that help make their buildings more efficient. Better Buildings Alliance membership across these sectors includes nearly 60 member organizations (grocery chains, restaurants, and retailers) and totals close to 2.7 billion square feet of owned and managed building space. Collectively, members represent 19% of retail floor space nationwide.[4]

"The Alliance is the key forum to exchange energy efficiency ideas and conservation efforts with other national retailers."

- Kyle Wilkes,
Energy and Engineering Director, jcpenny
2013 Retail, Food Service, and Grocery Steering Committee Chair

Figure 7. Member Floorspace Compared to Market



Member in Action: Whole Foods Market

Whole Foods Market, Inc. has been a dedicated Better Buildings Alliance member since 2008. In April 2010, Whole Foods set an aggressive energy savings goal of reducing energy consumption at all stores by 25% per square foot by 2015. To help meet that goal, Whole Foods engages with the Better Buildings Alliance Technology Solutions Teams, including Lighting & Electrical, Space Conditioning, and Refrigeration. As an Advanced Rooftop Unit Campaign participant, Whole Foods recently pledged to evaluate and implement rooftop unit replacements or retrofits.

Whole Foods also engages with the Market Solutions Teams to investigate financial and energy savings that could be gained by addressing misalignment between accounting and actual equipment useful life.

Finally, Whole Foods Global Maintenance and Refrigeration Coordinator, Mike Ellinger, serves on the Better Buildings Alliance Retail, Food Service & Grocery Steering Committee to help identify new strategies for the retail and grocery sectors and ensure current activities are responsive to industry needs.

Whole Foods Market set an aggressive energy savings goal of reducing energy consumption at all stores by 25% per square foot by 2015.

Whole Foods Market 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.

Members

A&P
Applebee's International
Arby's Restaurant Group
Army & Air Force Exchange Service
Belk
Best Buy
BJ's Wholesale Club
Boston Market
Chipotle Mexican Grill
CKE Restaurants (Carl's Jr., Green Burrito, Hardee's, Red Burrito)
Costco Wholesale
Crate and Barrel
Einstein Noah Restaurant Group (Einstein Bros Bagels, Noah's Bagels, Manhattan Bagel)
Food Lion
Ford Motor Company
Fresh & Easy Neighborhood Market
Hannaford
Harris Teeter Inc.
jcpenney
John Deere
Kohl's Department Stores
Lamey-Wellehan Shoes
Lowe's Companies, Inc.
Macy's
McDonald's
Office Depot
OfficeMax
Panda Restaurant Group (Panda Express, Panda Inn, Hibachi-San)
PETCO Animal Supplies
PetSmart
Publix Super Markets
REI
Red Robin Restaurants
Rutter's Holdings
Safeway
Sears Holding
Sonic
Staples
Starbucks Coffee Company
SUPERVALU
Target
The Home Depot
The Stop & Shop Supermarket
Toyota Motor Sales, U.S.A.
Ulta
U.S. General Services Administration
Walgreens Co.
Walmart Stores
Wawa
Weis Markets
Wendy's Quality Supply Chain Co-op
Whole Foods Market
Yum! Brands (KFC, Pizza Hut, Taco Bell)

Affiliated Organizations:

American Institute of Architects (AIA)
American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
Illuminating Engineering Society of North America (IES)
International Facility Management Association (IFMA)
National Association of Convenience Stores
Professional Retail Store Maintenance Association
Retail Industry Leaders Association
Unified Foodservice Purchasing Co-op, LLC

Members in **bold** have taken the Better Buildings Challenge

Public

In 2013, DOE launched the Public Sector arm of the Better Buildings Alliance. Membership in the Better Buildings Alliance has enabled states, local governments, and K–12 school districts to further their clean energy goals, expand skills, and take advantage of technical resources provided by DOE experts and thoughtful peer exchange.

Public buildings spend more than $18 billion on energy each year and consume almost 15% of the total commercial building energy use nationwide.[4] K–12 energy costs are second only to personnel costs as the leading draw on school district operating budgets, totaling about $8 billion annually nationwide. It is estimated that $2 billion can be saved by improving energy efficiency in K–12 schools, an amount equivalent to the cost of nearly 40 million new textbooks.[19]

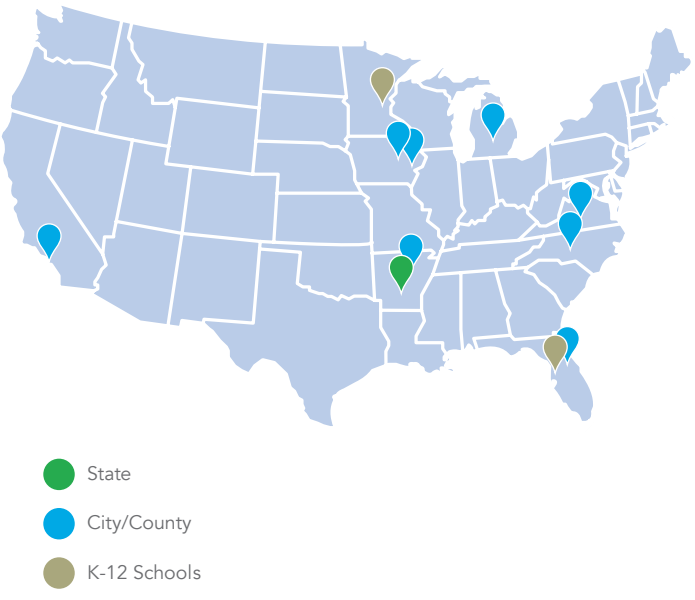
Four new teams geared specifically towards the Public Sector were added to the Better Buildings Alliance. These teams have equipped public sector organizations with technical assistance, support materials, and peer networks to support project implementation.

The Public Sector Teams focus on the following specific areas:

- The Energy Savings Performance Contracts (ESPC) Team (page 53) develops an administrative framework, including templates and tools, to help organizations with ESPC set-up and implementation.
- The Strategic Energy Planning Team (page 53) supported participants in developing energy goals, identifying and engaging stakeholders, prioritizing actions, and implementing strategic energy plans in their communities.
- The Finance Strategies Team (page 54) reviews financial mechanisms that could provide program options and best practices for supporting cost-effective and sustainable energy project implementation.
- The Data Management Approaches Team (page 54) focuses on identifying critical elements that are needed to benchmark energy use across a portfolio of buildings. The group developed benchmarking skills to support the management of energy data and decision making to promote energy improvements.

Over the past year, Public Sector Better Building Alliance participants also engaged with the Better Buildings Alliance Technology Solutions Teams to support specific community needs. Combined, this technical expertise from DOE along with community forums supported the coalition of public sector Better Buildings Alliance members. At the time of publishing, 11 public sector organizations have joined the Better Buildings Alliance, representing more than 43 million square feet of public sector building space.

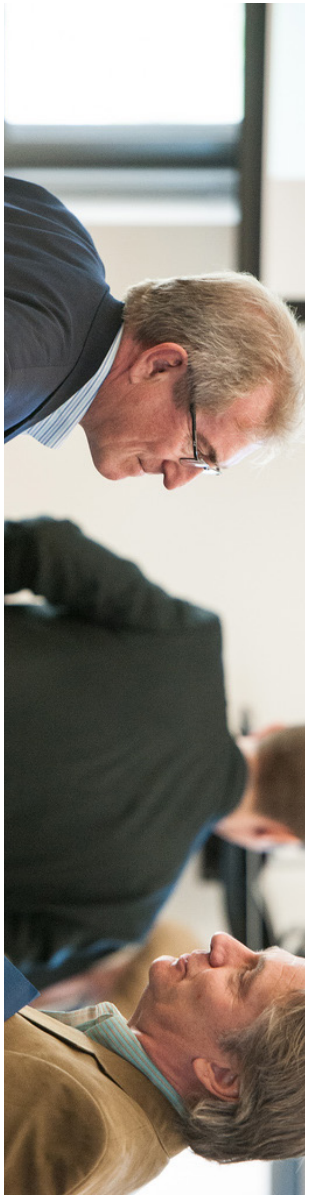
Figure 8. First Year Public Sector Member Representation

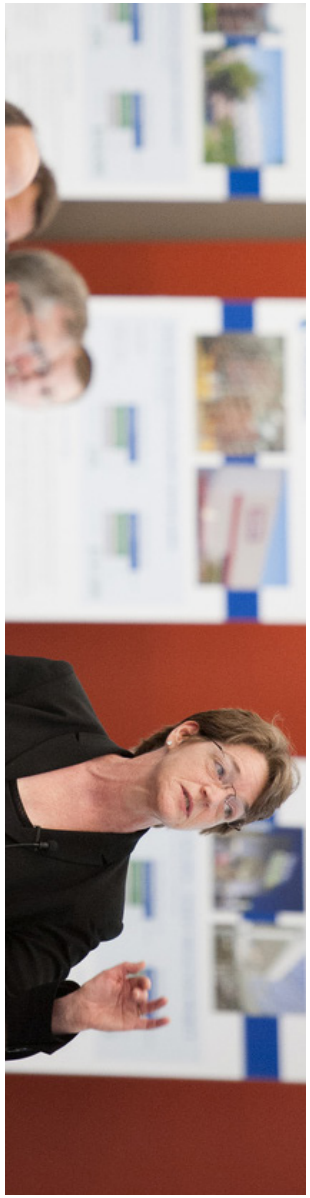


Members

Alachua County Public Schools, FL
City of Cedar Rapids, IA
City of Charlottesville, VA
City of Davenport, IA
City of Jonesboro, AR
City of Santa Monica, CA
Mecklenburg County, NC
Oakland County, MI
South Washington County Schools, MN
State of Arkansas
Volusia County, FL

EDUCATION AND OUTREACH





Education and Outreach

Members of the Better Buildings Alliance are high-level executives and professionals who recognize the value of sharing ideas, best practices, and problem-solving strategies with peers who face similar energy challenges. As such, the program expanded its education, outreach, and information programs in 2013 to offer members valuable new resources and expanded networking and training opportunities.

2013 HIGHLIGHTS

Better Buildings Alliance Efficiency Forum

On May 29 and 30, DOE hosted over 175 attendees at the second annual Better Buildings meeting for commercial and higher education partners at the National Renewable Energy Laboratory (NREL) in Golden, Colorado, at the nation's largest net-zero energy office building. Dr. Kathleen Hogan, DOE's Deputy Assistant Secretary for Energy Efficiency, recognized notable accomplishments of Better Buildings Alliance and Better Buildings Challenge Partners, including energy efficiency showcase projects, implementation models highlighting organizational success stories, and energy use data sharing.

At the event, the Better Buildings Alliance leadership took the opportunity to:

- Recognize Carrier Corporation as the second manufacturer to meet the Rooftop Unit (RTU) Challenge with a highly efficient product that exceeds the 18 IEER performance requirement.
- Announce that the Lighting Energy Efficiency in Parking Campaign had already exceeded its 100 million square foot participation target.
- Introduce the Advanced RTU Campaign led by ASHRAE and the Retail Industry Leaders Association (RILA), in coordination with the Better Buildings Alliance, encouraging building owners to upgrade to more efficient RTU technology.
- Launch the Wireless Meter Challenge, seeking to increase the market availability of reliable, low-cost wireless submeters.

Kristen Taddonio, Better Buildings Alliance Program Manager, also recognized outgoing Better Buildings Alliance Steering Committee chairs for their leadership. The Steering Committee chairs included John Scott, Colliers International (Commercial Real Estate), John Krolicki, University of Pittsburgh Medical Center (Healthcare), and James McClendon, Walmart Stores (Retail). Key takeaways were published in the 2013 meeting report, available online at eere.energy.gov/betterbuildingsalliance.

State & Local Summit

On May 30 and 31, DOE hosted more than 250 attendees in Washington, DC at the second annual Better Buildings Summit for state, local, and K–12 education leaders. Public sector leaders had the opportunity to engage with their peers, as well as representatives from DOE and the private and non-profit sectors, on successful approaches to achieving the benefits of energy efficiency and renewable energy in public buildings and local communities. Through a variety of breakout sessions, attendees learned innovative strategies, policies, and models for adopting and implementing clean energy solutions in their communities that save money, create jobs, increase energy security, and protect the environment. At the Summit, Dr. David Danielson, Assistant Secretary for Energy Efficiency and Renewable Energy, recognized the accomplishments of 34 Better Buildings Challenge Partners for their energy efficiency showcase projects, implementation models highlighting organizational success stories, and energy use data sharing.

DOE also recognized the achievements of cities and counties under the Energy Efficiency and Conservation Block Grant (EECBG) Program. Eleven state and local governments and K–12 school districts partnered with DOE under the Better Buildings Alliance since the Public Sector's launch in March 2013, and eight new public sector Better Buildings Challenge Partners stepped up to join the Challenge. To view presentations from the 2013 Summit for State and Local Leaders, visit www1.eere.energy.gov/wip/solutioncenter/better_buildings_summit_2013.html.

The Better Buildings Webinar Series

DOE launched a robust Better Buildings Webinar Series in August 2013. The expanded webinar series focuses on the real solutions that the Better Buildings Alliance, Better Buildings Challenge, and Better Buildings Better Plants program participants have implemented to overcome barriers to energy efficiency for the public, private, and industrial sectors.

- August 6, 2013: Commercial Building Energy Data Access: A Success Story
- September 4, 2013: Tying Energy Efficiency to Compensation and Performance Reviews
- October 1, 2013: Speaking the CFO Language: Building the Case for Energy Efficiency with Financial Decision-makers
- November 5, 2013: Intra-organization Energy Efficiency Competitions
- December 3, 2013: Deep Energy Retrofits

Webinar participation ranged from 250 to nearly 500 attendees per webinar. For details and links to webinars where available, see the Better Buildings Alliance Events web page and "Webinar Presentations" sidebar. DOE also distributes a monthly webinar update email to all members.

Better Buildings Update Newsletters

Over the course of 2013, DOE launched two "Better Buildings Update" Newsletters, including one in March 2013 and one in July 2013. These newsletters recap key Better Buildings events and webinars described above, welcome the program's newest members, and summarize new program resources.

The Better Buildings Alliance Website

In May, DOE launched the updated Better Buildings Alliance website to enhance usability and better fit the needs of this fast-growing initiative. The site now organizes activities, resources, and engagement opportunities across 5 sector group pages and 15 solutions team pages. The new pages are easier to navigate to encourage member involvement in activities such as the Advanced RTU Campaign, the LEEP Campaign, the Wireless Metering Challenge, site demonstrations, and activities from the Market Solutions Teams, Technical Solutions Teams, and Public Sector Solutions Teams. Visit the new site at eere.energy.gov/betterbuildingsalliance.

WHAT TO EXPECT IN 2014

- New topics for the Better Buildings Webinar Series. The series will continue into 2014, tackling a different issue each month such as data access, green revolving loan funds, capital set-asides, engaging building occupants in energy efficiency, net-zero energy buildings, and tying energy efficiency to compensation and performance ratings.
- DOE will be holding the 2014 Better Buildings Summit in Washington D.C., a national Summit to catalyze investment in energy efficiency across the public, private, commercial, industrial, and multifamily sectors. For more information, visit http://www1.eere.energy.gov/buildings/betterbuildings/summit/.

2013 WEBINAR PRESENTATIONS

LEEP- Lighting Controls for Parking Facilities

Deep Energy Retrofits

Buildings the Business Case for Adoption of Energy Information Systems

Better Buildings Workforce Guidelines

Intra-organization Energy Efficiency Competitions

Speaking the CFO Language: Building the Case for Energy Efficiency with Financial Decision-makers

Advanced RTU Campaign Resource Spotlight: RTU Performance Calculators

Targeting 100! How Healthcare Can Meet the 2030 Challenge

Overview of the Advanced RTU Campaign with NYSERDA for Customers and Contractors

Tying Energy Efficiency to Compensation and Performance Reviews

Street and Parking Facility Lighting Retrofit Financial Analysis Tool

Commercial Building Energy Data Access: A Success Story

Advanced RTU Campaign

Commercial Building Partnership Success Story: A Look at PNC Bank's Net Zero Bank Branch in Fort Lauderdale, FL

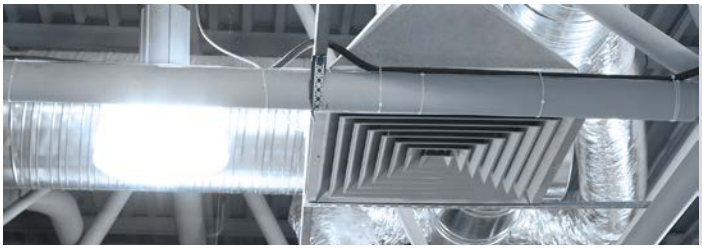
Commercial Building Partnership Success Story: A Look at The Home Depot's most Energy Efficiency Store

Revised Performance Specification for the Wireless Metering Challenge

Commercial Kitchen Demand Control Ventilation (DCV)

TECHNOLOGY SOLUTIONS TEAMS

LIGHTING & ELECTRICAL



SPACE CONDITIONING

PLUG AND PROCESS LOADS

FOOD SERVICE

REFRIGERATION

LABORATORIES

ENERGY MANAGEMENT INFORMATION SYSTEMS

Technology Solutions Teams

Deploying currently available, cost-effective technologies could reduce the annual commercial and industrial building energy consumption by nearly 6 quads—a 20% end-use energy savings—by 2020 as compared to business as usual projections.[20] These significant energy savings could be put toward growing businesses and creating jobs.

The Better Buildings Alliance Technology Solutions Teams are designed to help commercial building owners realize these opportunities. This section will describe how members are working with DOE and each other to achieve whole-building energy savings by adopting innovative lighting, space conditioning, refrigeration, plug load, food service, laboratory, and energy information system technologies.

2013 HIGHLIGHTS

- Facilitated the commitment to install over 110 million square feet in high-efficiency parking facility lighting through the Lighting Energy Efficiency in Parking (LEEP) Campaign. The LEEP Campaign surpassed the original goal of 100 million square feet.
- Launched the Advanced RTU Campaign to help building owners choose high-efficiency RTU solutions that could provide 30% energy savings over their current operations. The Advanced RTU Campaign provides options for early retirement of existing, inefficient RTUs or retrofit of existing units with advanced controls.
- Conducted fume hood sash management campaigns with four laboratory members to reduce fume hood energy use by 20%–70%.
- Published the Guide for the Retrofitting of Open Refrigerated Display Cases with Doors that has been used to help facilitate the development of utility incentive programs for this energy savings measure.
- Developed data to show that plug and process load densities are lower by a factor of 5–10 than what is typically requested, negotiated, or required in commercial building leases.
- Synthesized information from 28 leading organizations that have implemented energy information systems (EIS) and found that participants achieved year-over-year median site savings of 16%, and portfolio-wide savings of 8%, with examples of paybacks in the 1–3 year range.
- Launched the Wireless Meter Challenge to accelerate innovation of wireless submeters that cost less than $100 per point.

WHAT TO EXPECT IN 2014

- Announce the first manufacturers to meet the Wireless Meter Challenge.
- Pilot a technology solutions team focused on integrating renewables into energy-efficient buildings.
- Expand the technologies and performance data included in the Technology Performance Exchange.

Technical Specifications

The Better Buildings Alliance released three new technical specifications for troffer lighting, wall pack lighting, and wireless metering in 2013. In total, the Better Buildings Alliance has released 10 procurement specifications and 2 challenge specifications for efficient commercial lighting, space conditioning, water heating, plug load, and submetering technologies. If commercial buildings in the U.S. switched today to technologies that met these specifications, more than 2.0 quads per year of source energy would be saved – roughly 12% of total annual U.S. commercial building energy use and more than the total energy consumed by South Carolina.[21]

Procurement Specifications

The following customizable specifications can be used in requests for proposals (RFPs) and in procurement documents. Find them online at eere.energy.gov/betterbuildingsalliance/specs. Additional procurement resources are available at www.energystar.gov and femp.energy.gov.

- High-Efficiency Troffer Lighting Specification: 50% of all commercial fluorescent lighting fixtures are recessed troffers in 1'x4', 2'x2', 2'x4' configurations. They are in operation for more than 10 hours a day on average and collectively consume more than 990 trillion Btu of electricity annually.[22] Building owners who use the high-efficiency troffer specification can save 15%–45% on their lighting energy costs on a one-for-one basis and up to 75% with the use of controls. Nationwide, if all troffers switched today to meet the Better Buildings Alliance specification requirements, 290 trillion Btu of electricity could be saved annually, more than the energy used to run 5 coal-fired power plants.[23]
- LED Site (Parking Lot) Lighting Specification: Most parking lots are illuminated by older high-intensity discharge (HID) lighting technology without any energy-saving controls. New light-emitting diode (LED) technology with controls can cut parking lot lighting energy bills by 40% or more while delivering additional benefits including long life, reduced maintenance costs, and improved lighting uniformity.[24] Around 450 trillion Btu could be saved annually if all parking lot lighting nationwide met the high-efficiency lighting specification, more than the energy use for the state of New Hampshire and Vermont combined.[21]
- High-Efficiency Parking Structure Lighting Specification: Parking structures or garages are often lit by older HID lighting technology without any energy-saving controls. The latest high-efficiency alternatives with energy-saving controls—including fluorescent, induction, and LED options—can save building owners more than 40% on their parking lot lighting bills compared to typical code, while delivering additional benefits including better- lighted spaces.[24] Updating all high-efficiency lighting in parking structures nationwide to meet the specification could save an estimated 410 trillion Btu of source energy annually, approximately equal to the total energy use for the state of Maine.[21]
- High-Efficiency Wall Pack Lighting Specification and Application Guidance: In 2013, the Lighting & Electrical Team added the Wall Pack Specification and Application Guidance to its suite of exterior lighting resources. By applying this specification and application guidance, building owners can expect to save 38% on a one-for-one basis and 68% if controls are utilized. Additional benefits include longer life and lower maintenance costs.[25] Updating all wall packs nationwide to meet the specification requirements could reduce source energy by an estimated 1.6 trillion Btu annually, equivalent to the energy saved by taking 24 thousand passenger vehicles off the road.[23]
- LED Refrigerated Display Case Lighting Specification: This specification delivers about 50% energy savings compared to a typical display case lighting code. If all retail refrigerated display cases nationwide switched to LED systems, approximately 24 trillion Btu of source energy annually could be saved, more than the energy consumed by 100 thousand single family homes.[26]
- Gas Heaters Specification: High-efficiency gas-fired space heaters offer more than 10% savings over standard models for semi-conditioned spaces and other locations using non-centralized heating

equipment. Improved space heaters that meet the Better Buildings Alliance specification raise efficiency by employing features such as condensing heat exchangers, direct-fired combustion, and infrared technology. Nationwide, if all gas heaters were replaced with products that met the specification, around 54 trillion Btu of source energy per year could be saved, more than the energy consumed by 240 thousand single family homes.[26]

- Fume Hoods Specification: A single fume hood in a typical lab can use more than 33,500 kWh of electricity per year and about 3,000 therms of natural gas per year. Laboratory fume hoods built to the specification can reduce electricity use by at least 50% compared to baseline units—while also reducing space conditioning energy loads. Replacing a conventional unit with a fume hood that meets the specification could save up to 16,750 kWh a year in electricity use and 1,500 therms of natural gas use, for more than $5,000 in cost savings over 2 years.[27] If all laboratory fume hoods nationwide were replaced today with hoods that met the specification, an estimated 250 trillion Btu of source energy per year could be saved, more than the energy used to run 4 coal-fired power plants.[23]
- Ultra-low Temperature Freezers (ULF) Specification: A typical ULF can use up to 20 kWh of electricity per day. Replacing it with a unit that meets the specification could save over 2,000 kilowatt-hours (kWh) per year, producing cost savings of over $200 annually.[28] If all ultra-low temperature freezers were replaced today with units that meet the specification, approximately 600 billion Btu of source energy per year could be saved, equivalent to reducing energy demand by 100,000 barrels of oil.
- Commercial Heat Pump Water Heater Specification: An older, electric resistance water heater operated in a building with a hot water demand of 500 gallons a day can cost more than $3,500 each year in electricity costs. Heat pump water heaters that meet the specification can use 70% less energy and generate savings up to $12,500 over 5 years.[29] Nationwide, if all commercial electric water heaters were replaced today with heat pumps that meet the specification, over 30 trillion Btu of source energy could be saved annually, more than the energy consumed by 140 thousand single family homes.[26]
- Low-voltage Distribution Transformer Specification: An older transformer in a typical office building can consume 16,000 kWh and cost more than $1,500 in electricity costs per year. Replacing existing, older transformers with a transformer that meets the specification can save nearly $250 annually.[30] If all distribution transformers were replaced today with units that meet the specification, nearly 11 trillion Btu of source energy could be saved per year, equivalent to the energy saved by taking 165 thousand passenger vehicles off the road.[23]

Challenge Specifications

Challenge specifications encourage manufacturers to go beyond what is currently available on the market and to innovate new technologies that meet customers' energy efficiency needs. DOE has released two challenge specifications in cooperation with our Better Buildings Alliance members:

- Wireless Meter Challenge: In 2013, the Better Buildings Alliance launched the Wireless Meter Challenge and has garnered the support of 18 manufacturers to date including BLUEdev, Continental Controls, IE Technologies, Leviton, Schneider Electric and others. The Wireless Metering Challenge performance specification challenges manufacturers to develop a low-cost wireless metering system (less than $100 per point), that meets essential requirements for electrical energy measurement, and transmits data wirelessly to an onsite collection point. Sixteen private sector organizations ranging from grocers to higher education systems have signed letters of support to invest in meters that meet the challenge. Electricity submeters provide building operators with the information necessary to make informed decisions about opportunities to save energy. Nationwide, the Department of Energy conservatively estimates that if commercial buildings used submeters to identify energy savings of just 2%, it would represent actual cost savings of $1.7 billion.[31] Learn more online at energy.gov/articles/federal-and-industry-partners-issue-challenge-manufacturers.
- Rooftop Unit Challenge: Rooftop units (RTUs) are used in nearly half of all cooling conditioned commercial floor space in the United States. RTUs that meet the Better Buildings Alliance specification are expected to reduce RTU electricity use by up to 50% compared to existing stock and 44% compared to ASHRAE Std. 90.1-2010 depending on facility location and type, with an opportunity for as much as $3 billion in annual energy cost savings across the U.S.[32] Learn more online at eere.energy.gov/betterbuildingsalliance/rtu.

Resources, Case Studies, and Guidance

In addition to procurement and challenge specifications, the Better Buildings Alliance Technology Solutions Teams produce resources, case studies, and guidance to support the adoption, demonstration, and delivery of energy-efficient technologies.

2013 HIGHLIGHTS

- Published the Exterior Lighting Controls Guidance Report to help building owners adopt the highest impact exterior lighting controls strategy. (Read more on page 30.)
- Developed step-by-step implementation guidelines for fume hood sash management, optimizing air change rates, minimizing reheat, and ultra-low temperature freezer energy management. (Read more on page 40.)
- Supported the potential development of an ENERGY STAR Energy and Water building performance scale for food service facilities. (Read more on page 36.)
- Developed Energy Management Guidance for food service applications. (Read more on page 37.)
- Created a Toolkit to support the adoption of advanced rooftop units including a decision tree and spreadsheets to inventory and field evaluation spreadsheets. (Read more on page 32.)
- Published the Energy Management Information Systems (EMIS) technology classification framework to help define and clarify varying EMIS technology applications and solutions. (Read more on page 43.)

The Technology Performance Exchange

In 2013, Better Buildings Alliance members collaborated with DOE to release the Technology Performance Exchange, a web-based portal that allows consumers, manufacturers, vendors, modelers, researchers, and utilities to find and share information regarding the performance of various energy-saving products. Through the use of an intuitive user interface and a centralized database, the Technology Performance Exchange provides users the ability to explore third party and manufacturer testing results and compare the energy performance of products and technologies side-by-side. The Technology Performance Exchange displays data to enable users to predict credible energy savings and allows end users to evaluate the site-specific performance of various technologies.

Based on this information, users can conduct effective financial analyses and make well-informed procurement decisions.

In 2013, the Technology Performance Exchange added energy performance data for roughly 20,000 products. In 2014, the Better Buildings Alliance will expand the number of technologies and performance data included and foster the development of a robust user group.

Lighting & Electrical

Commercial lighting accounts for over 3.7 quads of source use energy per year, which is over 20% of total commercial building energy use. Exterior lighting, such as that found in parking lots, accounts for another 1.3 quads.[33] Fortunately, lighting can often provide some of the easiest, most cost-effective energy-saving opportunities for building owners and occupants. Members of the Better Buildings Alliance Lighting & Electrical Team reduce lighting energy use by sharing cost-effective solutions to interior and exterior lighting challenges and through the development of lighting specifications to build demand for higher efficiency technology. Learn more online at eere.energy.gov/betterbuildingsalliance/lighting.

"Walmart used the Better Buildings Alliance Troffer Lighting Specification as the basis to develop bid specifications for these products."

– Ralph O. Williams, Walmart

2013 HIGHLIGHTS

- Released a new specification for wall pack lighting, with savings potential of up to 38% on a per unit basis. The savings potential increases to 68% if controls are employed. A building that uses 20 specification-compliant wall packs could save over $1600 on energy costs in 5 years.
- Released Version 4.0 of the High Efficiency Troffer Specification. Potential savings from applying the specification range from 15%–45% on a one-for-one basis. The savings potential increases to 75% if used with controls.[34]
- Completed the Exterior Lighting Controls Guidance report. This document helps building owners and operators decide which control strategies to use, depending on their lighting technology choices and their unique circumstances. The savings potential from applying exterior controls is significant, ranging from 30%–50%.[35]
- Surpassed goal for the Lighting Energy Efficiency in Parking (LEEP) Campaign midway through the year, with more than 160 partners and supporters. Members of campaign partners own or operate the vast majority of commercial parking spaces in the United States and constitute extraordinary potential for energy savings in the parking market. Participants have thus far committed over 113 million square feet of high-efficiency parking facility space via the LEEP campaign.[36] Twenty-eight of these organizations are Better Buildings Alliance members.
- Released a case study, Walmart Demonstrates LEDs on the Sales Floor, that demonstrates savings across lighting, cooling, heating, and total energy consumption with a simple payback of less than 4 years.

WHAT TO EXPECT IN 2014

- LEEP Campaign award announcements at the International Facility Management Association (IFMA) Spring Conference and Expo (Facility Fusion) on April 15, 2014.
- Increased focus on high-efficiency interior lighting and control systems.
- Demonstrations and guidance on adaptive exterior lighting controls, such as bi-level and dimming controls.

The Lighting Energy Efficiency in Parking (LEEP) Campaign

The Lighting & Electrical Team partnered with the Building Owners and Managers Association (BOMA), International Facility Management Association (IFMA), the Green Parking Council (GPC), and numerous supporting organizations to launch LEEP in 2012. LEEP Campaign efficiency targets translate to lighting that uses roughly one-third less energy than current energy code (ASHRAE Std 90.1-2010). More than 80 parking facility owners and managers have taken the pledge to save energy and money in over 113 million square feet of parking facilities, and more than 85 organizations have joined as Campaign supporters that help spread the word.

For retrofit sites, LEEP participants often achieve more than 50% energy savings compared to systems that are replaced. Participants also achieve over 75% energy savings when lighting controls are incorporated. Nationwide, if all parking lots and structures switched to high-efficiency lighting that meets the requirements of the Better Buildings Alliance lighting specification, the collective savings would be over 860 trillion Btu annually of source energy.

Building owners and managers who participate in the LEEP Campaign agree to evaluate their portfolio of parking lots or parking structures for opportunities to use high-efficiency lighting that are feasible and cost-effective. Participants receive awards and recognition based on participation and can take advantage of tools/resources, and limited technical assistance. Join the Campaign at www.leepcampaign.org.

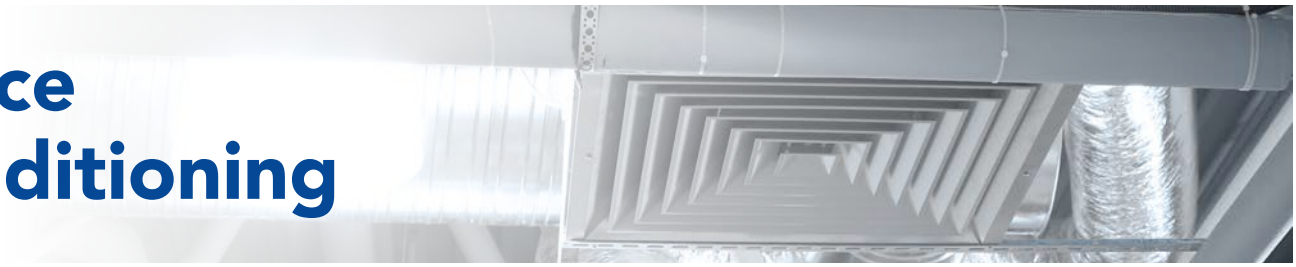
Lighting Specifications

The Lighting & Electrical Team maintains several lighting specifications which cover High-Efficiency Troffers, LED Site (Parking Lot) Lighting, High-Efficiency Parking Structure Lighting, High-Efficiency Wall Packs, and LED Refrigerated Display Cases. These customizable specifications can be used to solicit requests for proposals (RFPs) from vendors and are used by Better Buildings Alliance organizations for procurement. Specifications include default recommendations for a variety of lighting characteristics that can be modified as necessary to suit the needs of various end users. Learn more about Better Buildings Alliance specifications on page 27. Download these specifications and others at eere.energy.gov/betterbuildingsalliance/specs.

Members

Arby's Restaurant Group
Best Buy
BJ's Wholesale Club, Inc.
Boston Market
CBRE
CC Frost Properties
CentraCare Health
Cleveland Clinic
Costco Wholesale
Food Lion
Green Parking Council
Health Care REIT
HealthSouth
Hospital Corporation of America
IASIS Healthcare
Illuminating Engineering Society of North America (IES)
International Facility Management Association (IFMA)
Jones Lang LaSalle
Kaiser Permanente
Kimco Realty Corp.
Kohl's Department Stores
Lamey-Wellehan Shoes
Legacy Health System
McDonald's
MGM Resorts International
New York-Presbyterian Hospital
OfficeMax
Parmenter Realty Partners
PetSmart
Professional Retail Store Maintenance Association
Publix Super Markets
Rosemont Realty
Ryan Companies US
Safeway
Sinai Health System
Staples
Studley
Target
The Home Depot
The PNC Financial Services Group
The Related Companies
USAA Real Estate Company
University of Maryland
University of Maryland Medical Center
U.S. Department of Veterans Affairs
U.S. General Services Administration
U.S Navy CNIC Facilities and Acquisitions
Veterans Health Administration
Walgreens Co.
Walmart Stores
Wawa
Whole Foods Market

Space Conditioning



Commercial space conditioning, including heating, cooling, and ventilation, accounts for about 6 quads of source energy per year, or about one-third of total commercial energy use.[37] Fortunately, there are many cost-effective opportunities to reduce space conditioning energy use, such as tuning up existing systems, reducing supplemental energy loads to minimize the burden on heating and cooling systems, and replacing older equipment with new, high-efficiency equipment. Members of the Space Conditioning Team collaborate with their peers and with the DOE national laboratories to deploy these and other energy-saving space conditioning strategies. Learn more online at eere.energy.gov/betterbuildingsalliance/space conditioning.

2013 HIGHLIGHTS

- Announced the Carrier Weather Expert as the second product to meet the Rooftop Unit (RTU) Challenge.
- Completed RTU Advanced Control retrofit demonstrations across eight building types and eight locations showing an average energy savings over 50% compared to the baseline energy consumption.
- Launched the Advanced RTU Campaign on May 30 and gained significant market interest with 50 supporting partners and 16 participating partners committing to retrofit or replace over 300 RTUs at the time of printing.

WHAT TO EXPECT IN 2014

- Demonstrate, collect data, and develop resources to drive market adoption of RTU Challenge units which can be over 40% more efficient than units that meet ASHRAE Std. 90.1-2010.[32]
- Increase resources for the second year of the Advanced RTU Campaign, including case studies and procurement specifications.
- Expand team resources to include standard sequences of operation for air handling units (AHUs) and best practice guidelines for optimal ventilation control, duct leakage, and chiller plant optimization.

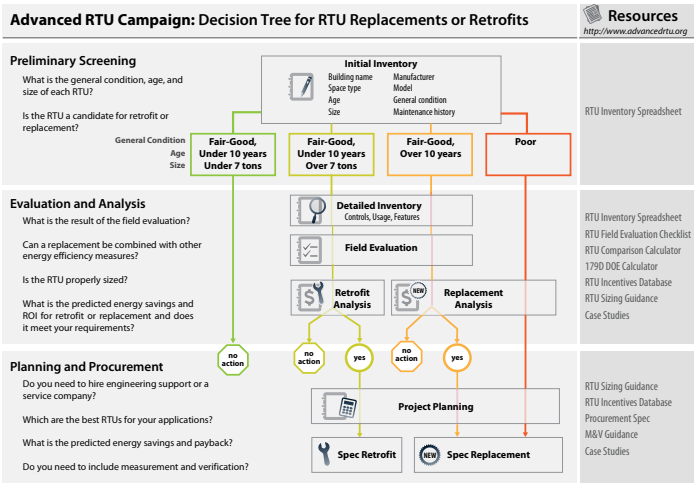
Table 1.
HIGH-EFFICIENCY RTUS AND CONTROLLERS

What is a high-efficiency rooftop unit (RTU)?	▶ The Advanced RTU Campaign defines a high-efficiency RTU as one that meets or exceeds the Consortium for Energy Efficiency (CEE) Tier 2 unitary air conditioning specification. ▶ Replacement of an older RTU with a Challenge specification compliant unit can provide 40%–50% electricity savings, improved comfort, and reduced maintenance costs. ▶ High-efficiency RTUs can be used to take advantage of available energy savings through the early retirement or replacement of existing RTUs.
What is an advanced RTU retrofit controller?	▶ An advanced RTU retrofit controller changes a constant speed RTU into a single-zone variable air volume unit. ▶ Additional features may include integrated economizer control, demand controlled ventilation, and other features. ▶ Retrofit controllers can reduce energy consumption by 45% over existing constant speed RTUs. Retrofit controllers can be used to take advantage of available energy savings through the retrofit of existing RTUs.

Advanced RTU Campaign

Packaged air conditioners and heat pumps cool approximately 60% of the commercial floor space in the United States. Several retrofit and replacement technologies can reduce packaged unit energy use by 20%–50%. U.S. businesses could save between 500 and 1,200 trillion Btu if commercial RTUs and heat pumps nationwide were replaced with high-efficiency units or retrofitted with advanced controls.

The Advanced RTU campaign was created to drive the market toward the widespread adoption of higher efficiency units through the development of solutions and resources that help owners and operators overcome technical and market barriers. The Advanced RTU Campaign is a partnership between the DOE Better Buildings Alliance, ASHRAE, Retail Industry Leaders Association, and several other supporting organizations that help building owners become participants and ultimately realize savings by installing advanced RTUs. Visit the campaign website www.advancedrtu.org to find more information, register and start saving.



The Decision Tree for RTU Replacement or Retrofits resource helps Advanced RTU Campaign participants organize RTUs into bins for "retrofit," "replacement," "no action," or "needs further analysis".

Resources provided to support the Advanced RTU Campaign include:

- RTU Incentives Database: A user-friendly, searchable database of incentives and special financing available for high efficiency RTUs.
- RTU Inventory Spreadsheet: A database of RTUs organized by applicable characteristics to help owners and operators gather the necessary information to conduct a preliminary screening.
- Decision Tree for RTU Replacements or Retrofits: Step-by-step guidance on how to conduct a preliminary screening of RTUs for retrofit or replacement.
- RTU Field Evaluation Checklist: A simple tool available to perform a visual field inspection of RTUs. Based on this field inspection, owners and operators can more easily prioritize retrofit and replacement plans.

The Advanced RTU campaign drives the market toward the widespread adoption of higher efficiency units and is a partnership between the Better Buildings Alliance, ASHRAE, Retail Industry Leaders Association, and other organizations.

Members

Adventist HealthCare
American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
Beaumont Health System
CBRE
Hospital Corporation of America
Jones Lang LaSalle
Legacy Health System
Living City Block
Mayo Clinic
PetSmart
Professional Retail Store Maintenance Association
Publix Super Markets
Starbucks Coffee Company
Summa Health System
Target
Texas Children's Hospital
The Home Depot
The Walt Disney Co.
U.S. Department of Veterans Affairs
U.S. General Services Administration
Walgreens Co.
Walmart Stores
Wawa
Whole Foods Market

Plug & Process Loads

Commercial plug and process loads (PPL) such as computers, printers, fax machines, beverage dispensers and ATM machines account for nearly 4 quads of source energy per year, or about 20% of commercial building energy use.[37] In recent years, this has been one of the fastest growing areas of building energy use. Fortunately, plug loads can provide some of the easiest and most cost-effective energy savings opportunities. Members of the Plug and Process Loads Team develop metering, design, procurement, and operational resources to improve the efficiency of plug and process equipment and to reduce unnecessary use of idle or duplicative equipment. Learn more online at eere.energy.gov/betterbuildingsalliance/plugloads.

> "The connection of individual employee equipment to motion sensor activated plug strips provides an opportunity for the University to manage energy consumption at empty desks."
>
> *-James Moyer, Grand Valley State University*

2013 HIGHLIGHTS

- Published guidance documents on plug load capacity needs for commercial building owners and tenants that are negotiating leases and for planning occupant spaces.
- Provided members with low- and no-cost recommendations to reduce plug load energy use, such as establishing formal plug load management and procurement policies and procuring ENERGY STAR® qualified equipment through resources such as the U.S. General Services Administration's (GSA) Green Procurement Compilation.[38]

WHAT TO EXPECT IN 2014

- Launch of the Advanced Power Strip Campaign to drive the usage of power strips. Advanced power strips can reduce plug loads by as much as 28%.[39]
- Publish sample language for buildings owners and operators to take advantage of when developing power strip purchasing policies or vendor contracts. This language will leverage and highlight complimentary energy-efficient procurement resources from ENERGY STAR, Federal Energy Management Program's Commit to Efficiency Campaign, and the GSA's Green Proving Ground.

Plug and Process Loads Capacity Analysis

Due to a lack of information related to plug load capacity requirements, prospective building occupants and real estate brokers often request 5-10 watts per square foot of electric capacity to support plug and process loads as a requirement in their lease agreements. Overestimating plug load capacity leads designers to oversize electrical infrastructure and cooling systems thus creating inefficiencies in building design and energy performance.

In 2013, the Plug & Process Loads Team conducted a study of plug and process loads in 14 office buildings and 7 higher education buildings, totaling 2.5 million square feet.

Results of the study indicate an average plug load power density of around 0.50 watts per square foot for offices without laboratories or data centers, and 0.27 watts per square foot for higher education buildings. Offices with data centers or laboratories exhibit plug load power densities of up to 2.27 watts per square foot but still less than half of the typically required plug load capacity.[40]

With this evidence in hand, building owners, leasing brokers, and energy managers can adopt evidence-based plug load power densities that allow the right-sizing of heating, ventilation, air conditioning, and electrical systems. Right-sizing of heating, ventilation, and air conditioning system components can save 14% in upfront capital costs and expect a 3%–4% reduction in energy costs.[41]

Advanced Power Strip Campaign

Plug loads are among the fastest growing energy consumer categories in commercial buildings. Recent benchmarking and disclosure regulations add emphasis to plug loads and related occupant behavior loads as a low-cost means to achieving ongoing energy savings. However, achieving savings can be challenging as plug loads are typically distributed widely throughout a building and are not controlled. These challenges can be addressed through plug load planning and new control technologies. In 2014, the Plug & Process Loads Team will launch an Advanced Power Strip campaign that will

- Increase awareness about the energy saving capabilities of advanced power strip technology in office buildings.
- Provide a central hub for the marketplace to access resources, research, and rebate information related to advanced power strip devices.

Better Buildings Alliance members can benefit from low-cost energy savings, receive technical assistance and share best practices and lessons learned by participating in the campaign.

Low and No-Cost Recommendations to Reduce Plug Load Energy Use

Plug and process loads offer many low- and no-cost opportunities for energy savings.[42] The Plug & Process Loads Team offers tips, guidance, sector-specific checklists, and examples of best practices in plug load management from other members. Learn more online at eere.energy.gov/betterbuildingsalliance/plugloads.

Members

American Society for Healthcare Engineering (ASHE)
American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
CBRE
First Potomac Realty Trust
Glenborough
Grand Valley State University
Gundersen Lutheran Health System
Hines
Legacy Health System
Newmark Grubb Knight Frank Global Corporate Services
PeaceHealth
Stanford University
The Home Depot
University of Maryland Medical Center
U.S. General Services Administration
Wawa

Food Service

Commercial food service operations have the highest energy use intensity (EUI) of any commercial sector. Annual consumption is nearly 1 quad of source energy, which is about 5% of total commercial use. Cooking accounts for one quarter of the total delivered energy use and increases the amount of space conditioning required in the building.[43]

Members of the Food Service Team work to reduce energy use by improving the efficiency of new food service equipment and reducing energy consumption throughout their buildings and operations. Learn more online at eere.energy.gov/betterbuildingsalliance/foodservice.

"The Better Buildings Alliance Food Service Team provides us with a great forum to share information about energy savings, our successes, challenges and best energy practices. The team projects are focused on the right issues that meet the current needs of the restaurant industry."

-Russ Subjinske, Wendy's Quality Supply Chain Co-op

2013 HIGHLIGHTS

- Collaborated with the Environmental Protection Agency (EPA), the National Restaurant Association (NRA), the Restaurant Facility Management Association (RFMA), and PG&E's Food Service Technology Center (FSTC) to assess food service energy and water consumption. Data from the assessment will be used by EPA to develop a building energy performance score (ENERGY STAR 1-100 score). The score will allow food service facilities to compare their energy consumption to the national, industry-wide average, and to other stores within their brand using the Portfolio Manager tool. If the project is successful, restaurants will be eligible for ENERGY STAR certification in the future.

WHAT TO EXPECT IN 2014

- Publish an Energy Management System (EMS) Guidance document for food service facilities in cooperation with the Energy Management Information Systems Team. The document will quantify the benefits of restaurant EMS as related to maintenance, operations, and avoiding catastrophic equipment failure.
- Publish a guidance document on commercial kitchen Demand Control Ventilation (DCV) technology.
- Continue collaboration with ENERGY STAR, the Consortium for Energy Efficiency (CEE), NRA, RFMA, and PG&E's FSTC to promote the use of efficient commercial food service equipment and technologies and develop better benchmarks for restaurants.

Food Service Building Benchmarking

In collaboration with the ENERGY STAR Commercial Buildings program, NRA, RFMA, and FSTC, the Better Buildings Alliance Food Service Team developed a food service energy and water consumption assessment. Assessment data will be used by EPA to develop a building energy performance score (ENERGY STAR

1-100 score) for food service buildings in Portfolio Manager, with the goal of making restaurants eligible for ENERGY STAR certification.

Businesses can reduce energy use by 20% or more by assessing energy performance, setting energy savings goals, and regularly evaluating building energy performance.[44] Building-level energy performance benchmarking is an integral part of this process.

Demand Control Ventilation (DCV)

Commercial kitchen DCV can dramatically impact ventilation and kitchen makeup air requirements. Commercial kitchen ventilation energy ranges from about 15,000 to 250,000 kWh per year, with limited-service restaurants typically using about 25,000 kWh per year and large kitchens about 125,000 kWh per year. Demand control ventilation can reduce annual fan energy use by significant amounts in both new restaurants and major renovations. Field studies have shown an average energy reduction of 57%, with savings ranging from about $1,500 for limited-service restaurants to $8,000 for large kitchens.[45] Current penetration of demand control ventilation technology in the food service sector is extremely low. One of the greatest barriers to implementation is a lack of awareness and education about the technology. The Food Service Technology Team will develop a guidance document to help users:

- Understand demand control ventilation, its potential benefits, and what is involved in new and retrofit installations.
- Determine the likelihood that a retrofit is technically and economically feasible in their restaurant(s).
- Follow best practices (e.g., training of staff and ongoing commissioning) that result in the best energy savings and the fewest project issues.

Energy Management Systems for Food Service

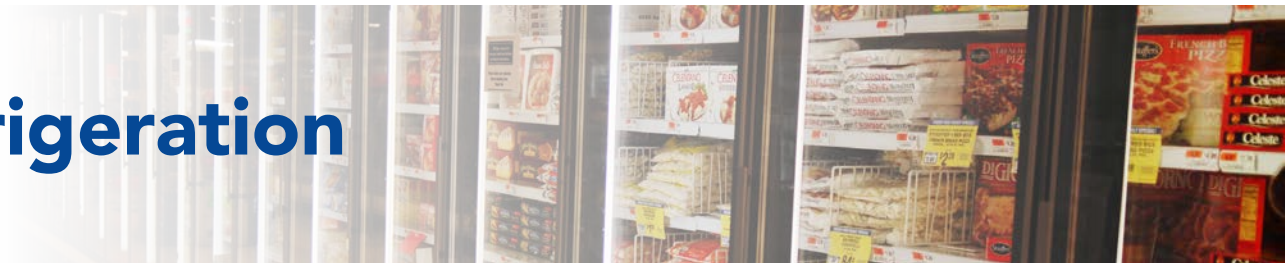
Energy management systems (EMS) help building managers reduce energy use by managing the operation of various systems and subsystems in a building. A typical restaurant could save up to $4,000 per year by using an effective EMS. If all restaurants deployed EMS today, the U.S. could save up to 130 trillion Btu of energy, or about $1.2 billion in energy costs per year.[46] In 2013, the Food Service Team drafted an EMS guidance document in collaboration with the Energy Management Information Systems Team (page 43) that informs potential users about the technology, its benefits, and the processes of evaluating, choosing, specifying, installing, commissioning, field testing, and scaling up an EMS.

Food Service Team members that have implemented EMS have realized short payback periods of less than 3 years due to energy savings and fewer service calls, combined with reduced downtime and product loss.[47] In 2014, the team will identify effective practices to achieve high-value benefits through controlled demonstration of those practices at restaurant chain stores with EMS. Some of these results are likely to uncover additional energy savings from use of an EMS that have not been previously documented.

Members

- Applebee's International
- Arby's Restaurant Group
- Army & Air Force Exchange Service
- Boston Market
- Chipotle Mexican Grill
- CKE Restaurants
- Einstein Noah Restaurant Group
- Harris Teeter
- McDonalds
- Panda Restaurant Group
- Red Robin Restaurants
- Sonic
- Unified Foodservice Purchasing Co-op
- Wawa
- Wendy's Quality Supply Chain Co-op
- Yum! Brands

Refrigeration



Commercial refrigeration equipment collectively accounts for about 1.2 quads of source energy use per year—roughly 7% of total commercial energy consumption[37]—and can account for up to half of the total energy use in supermarkets, groceries, convenience stores, and restaurants.[48] Approximately 90% of medium-temperature supermarket display cases are open.[49] As an example of potential savings, if these open cases were retrofitted today with doors, the national annual energy savings would be nearly 27 trillion Btu and businesses would save up to $250 million per year. Members of the Refrigeration Team work to improve the efficiency of new refrigeration systems and components, including display cases, coolers and freezers, compressor systems, and controls. The team also focuses on improving the energy efficiency of existing refrigeration systems through operational procedures and retrofit options. Team members represent many of the nation's most energy-innovative companies with large-scale refrigeration loads. Learn more online at eere.energy.gov/betterbuildingsalliance/refrigeration.

"The Better Buildings Alliance's Refrigeration Project Team provides an important forum for addressing the energy impacts of refrigerant issues in supermarket refrigeration systems."

- Harrison Horning, Hannaford Brothers

2013 HIGHLIGHTS

- Published and promoted the Guide to Retrofitting Doors on Open Cases.
- Cooperated with ASHRAE on the development of the Refrigeration Commissioning Guide for Commercial and Industrial Systems. Supermarkets can achieve up to 25% energy savings by commissioning refrigeration systems.[50]
- Released a Case Study of Fresh & Easy Neighborhood Markets including retrofits in 174 stores over almost 30 thousand linear feet of open display cases. These stores were able to reduce heating use by 50%–80% in addition to reducing electric use by 15%–20%.
- Supported the development of Southern California Gas incentives for retrofitting doors on refrigerated cases.
- Published technical articles highlighting energy savings through retrofitting doors on refrigerated cases in Air Conditioning, Heating & Refrigeration News (ACH&R News) and Refrigeration Service Engineers Society (RSES) Journal.

WHAT TO EXPECT IN 2014

- Publication of three low-global warming potential (GWP) alternative refrigerant refrigeration system case studies.
- Initiation of a refrigeration system challenge to encourage the design and implementation of systems utilizing technologies, features, and system design strategies that maximize energy performance. Participants will be recognized based on the level of achievement.

Doors on Open Refrigerated Cases

Open refrigerated display cases consume up to three times the energy of similarly configured cases with doors. Today, approximately 90% of all medium-temperature

supermarket display cases are open cases. Adding doors to open refrigerated display cases can save a typical supermarket more than $40,000 in energy costs per year. If all open refrigerated cases were retrofitted today with display doors, the national annual energy savings would be nearly 27 trillion Btu and supermarkets could save $250 million in energy costs.

Since releasing the Guide to Retrofitting Doors on Open Cases, it has been profiled in ACHR news, published in its entirety in the Refrigeration Service Engineers Society (RSES) Journal, and adopted as a RSES service application manual, helping to distribute it beyond the Better Buildings Alliance to RSES' 11,000+ members and 150+ chapters in the U.S. and Canada. Download the guide today at eere.energy.gov/betterbuildingsalliance/refrigeration. Find additional resources, including a savings calculator to help calculate economic benefits of retrofits, a recorded webinar discussing savings opportunities, and case studies highlighting success that other retailers have had with display case retrofits.

Supermarket Refrigeration Systems

The typical supermarket spends $180,000 per year on refrigeration energy costs. A single supermarket uses nearly 3 million kWh in electricity each year, of which 60% is used for refrigeration.[51] Assuming an average of 10% energy savings for properly commissioning refrigeration systems, supermarkets could see a collective national savings of up to 22 trillion Btu of source energy, or about $666 million in electricity costs per year.[52] In 2012, the Better Buildings Alliance began assisting ASHRAE in developing the Refrigeration Commissioning Guide for Commercial and Industrial Systems to lay out best practices for commissioning these systems. Throughout 2013, Refrigeration Team members worked with ASHRAE to develop an industry guide—helping retailers beyond the Better Buildings Alliance benefit from this low-cost energy savings opportunity. The guide will be published in the beginning of 2014, and the Better Buildings Alliance will help support its distribution and promotion.

Alternative Refrigerant Case Studies

According to the GreenChill partnership, there are over 35,000 supermarkets in the United States, and most of them use centralized direct expansion systems charged with 3,000–4,000 pounds of refrigerant. The most common refrigerants are ozone-depleting hydrochlorofluorocarbon (HCFC) refrigerants and blends consisting entirely or primarily of hydrofluorocarbons (HFCs), both of which are potent greenhouse gases. Unfortunately, refrigeration systems tend to leak, emitting up to 20% of their refrigerant charge per year.[53] Many Better Buildings Alliance member retailers, concerned about the environmental impacts of their operations, have begun to investigate and implement refrigeration systems using low-GWP refrigerants as an alternative to standard synthetic refrigerants that have significantly high GWP values. During 2013, the Refrigeration Team worked with several Better Buildings Alliance members to plan and initiate case studies examining the energy efficiency of refrigeration systems already using alternative refrigerant technologies such as CO_2 cascade and transcritical CO_2. Better Buildings Alliance member Hannaford Bros. has committed to participation in a case study of transcritical CO_2, the results of which will be published in 2014.

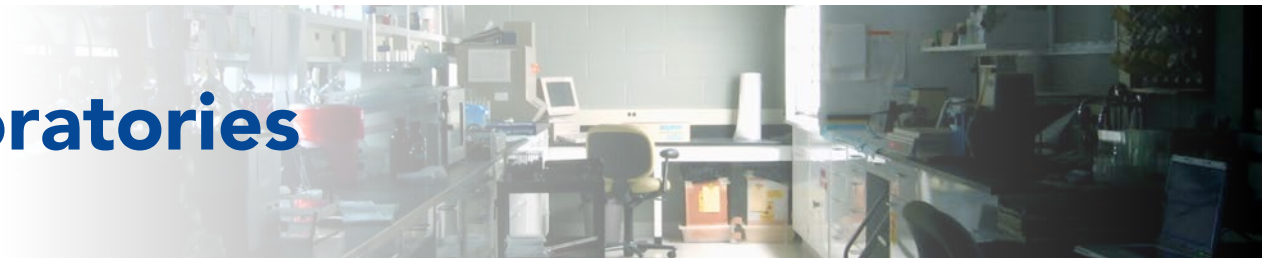
Refrigeration System Efficiency Challenge

The bulk of refrigeration system energy consumption can be attributed to compressor racks, which consume an estimated 370 trillion Btu of source energy annually and have significant opportunities for improvement. Refrigeration Team members own and operate a sizeable portion of the estimated 140,000 installed base of compressor racks and associated refrigeration systems, and can help to spur the development of more efficient technologies via a performance specification.[54] In 2013, team members worked in consultation with refrigeration engineers, manufacturers, and other stakeholders to develop a set of technical requirements that can be used during system design and equipment procurement to specify high-efficiency equipment. Moving into 2014, the Refrigeration Team plans to launch a refrigeration system challenge to identify and recognize high performers in this sector.

Members

- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- Food Lion
- Fresh & Easy Neighborhood Market
- Harris Teeter Inc.
- National Association of Convenience Stores
- Publix Super Markets
- Safeway
- SUPERVALU
- Target
- Walgreens Co.
- Walmart Stores
- Wawa
- Weis Markets
- Whole Foods Market

Laboratories



Laboratory facilities are very energy intensive, ranging from 250,000–800,000 Btu/square feet, or 3–8 times as much as an average office building. On a university campus, labs can constitute 40%–50% of total energy use, even though they may constitute less than 20% of the total floor space.[55] Laboratories have many unique efficiency opportunities that need specialized expertise. The Better Buildings Alliance Laboratory Technology Solution Team ("Labs Team") members reduce laboratory energy use by implementing low-cost operational best practices, developing specifications to build demand for more efficient laboratory equipment, and sharing information on cost-effective energy efficiency measures and best practices. Learn more online at eere.energy.gov/betterbuildingsalliance/labs.

2013 HIGHLIGHTS

The Labs Team focused on four low-cost, high-impact strategies and developed the following guides and resources to facilitate implementation by members in 2013:

- The Fume Hood Sash Management Guide, which provides step-by-step guidance on how to run a sash management campaign or competition. This resource was developed in collaboration with the Alliance to Save Energy Green Campus program.
- The Fume Hood Sash Management Resource Kit, which includes Better Buildings Alliance member examples of campaign posters and sash stickers.
- The "Getting Below Six Air Changes" document, highlighting three Better Buildings Alliance members that optimized air change rates (ACR) to below six air changes per hour.
- The Minimizing Reheat Guide, which provides step- by-step guidance on how to identify, quantify and minimize reheat in existing labs.
- The Freezer Energy Management Guide, describing strategies to reduce energy use of ultra-low temperature freezers, including specification and procurement, operations, maintenance, etc.

WHAT TO EXPECT IN 2014

- Engagement with lab users as efficiency co-partners. One of the persistent barriers to implementing efficiency in laboratories is that real and perceived risks, especially among users and safety personnel, prevent wider implementation of underutilized efficiency strategies. In 2014, the Labs Team will focus on strategies to engage laboratory users and safety personnel effectively as co-partners with facilities staff in implementing efficiency in labs.
- Publication of final results of fume hood and ultra-low temperature freezer demonstrations. Final results from ongoing fume hood and ultra-low freezer demonstration projects that document the real-world energy savings achieved through these measures will be available.

Fume Hood Sash Management

A single fume hood in a typical lab can use more than 33,500 kWh of electricity per year and about 3,000 therms of natural gas per year.[56] Reducing fume hood energy use can be as simple as training laboratory users to shut the sash when it is not in use. Although fume hood sash management is a proven energy-saving practice, laboratory users still fail to close sashes when not in use. Many facilities personnel give up on such "behavioral" measures, even when they prove to be significantly cost-effective. By sharing best practices and creating simple-to-use implementation guides and resources (e.g., sash stickers, "shut the sash" competitions), Labs Team members are increasing the adoption of this measure and assuring that the savings persist over time.

The Labs Team developed a step-by-step guide on how to implement a sash management program, in collaboration with the Alliance to Save Energy's Green Campus program. A resource kit of sample sash management stickers, posters and other promotional materials complements the guide.

Table 2 provides the highlights from sash management campaigns implemented by several Better Buildings Alliance members.

Laboratory Freezer Energy Management

A typical ultra-low temperature freezer can use as much electricity as a small house. Managing temperature settings and replacing or eliminating older freezers can save thousands of dollars each year.

The Better Buildings Alliance Labs Team developed an implementation guide for ultra-low temperature freezer energy management, primarily authored and based on the experiences of staff at the National Institutes of Health (NIH) and the University of California, Davis. The guide describes over a dozen actions to reduce freezer energy use, including many that are low/no capital cost. For example, measurements taken at NIH show that, when appropriate, a simple and fast way to save energy and cost (about $100 per year) is to "Chill Up." This involves increasing the set point by 10°C, which lowers the energy consumption of ULT freezer by 2–4 kWh per day.[58]

Simultaneous Heating and Cooling

Simultaneous heating and cooling is as inefficient as it sounds, yet is a common practice in today's commercial buildings. Labs Team members work to track and reduce simultaneous heating and cooling. A Labs21 study showed that strategies to reduce the reheating of cooled air (reheat energy use) could result in 11% to 14% total source energy savings.[57]

The Better Buildings Alliance's Labs Team developed a step-by-step guide to identify, track, and reduce reheat energy use in laboratories. The guide focuses on operational measures that have little or no capital cost. This approach was applied to a lab building at the University of California, Berkeley. The reheat reduction strategy included reducing minimum airflows, identifying and repairing problem zones, resetting supply air temperatures, resetting chilled water temperatures, and implementing temperature setbacks in non-critical zones. The projected cost savings from these reheat reduction strategies are about $50,000 per year with a simple payback of less than one year.

Table 2.
SASH MANAGEMENT CAMPAIGNS

Arizona State University	▶ Distributed an email to lab principal investigators, who shared information with staff in group meetings. ▶ Conducted fume hood surveys before and after email campaign. ▶ Number of open sashes dropped from 49% to 40% after campaign.
Tulane University	▶ Conducted one-on-one outreach to lab staff. Initial email-only approach was not effective. ▶ Number of open sashes dropped from 83% to 36% after campaign.
University of California, Berkeley	▶ Conducted campaign with tabling, posters, fume hood stickers, and articles in green newsletters. ▶ Reached 230 lab users. ▶ Ratio of relative sash height reduced from approximately 0.23 to 0.07 after campaign.
University of Colorado Boulder	▶ Conducted a new campaign for a new lab in which most occupants had already been targeted in previous campaigns and signage was already in place before labs moved in. ▶ Despite previous educational campaigns, there was a 34% reduction in sash height for vertical sashes and 22% reduction in width for horizontal sashes. This shows the need for continuous training and awareness.

Minimum Air Change Rates

Fresh air change rates in labs are important for safety, but too many air changes per hour can negatively impact both safety and efficiency. Optimizing air change rates can save a significant amount of money and energy. The Labs Team hosted two webinar meetings to discuss best practices and share results from team members. Three Better Buildings Alliance members presented best practices and results from optimizing air changes to below 6 air changes per hour (ACH). These were compiled into a guide published on the Labs Team website. Table 3 summarizes highlights from the guide.

Table 3.
OPTIMIZING MINIMUM AIR CHANGE RATES

Cornell University	▶ Reduced the ratio of occupied to unoccupied ACR from 8:4 ACH to 6:3 ACH. ▶ Verified safety and ventilation performance with spill analysis. ▶ Modified ductwork and location of registers for more effective exhaust and lower decay time. ▶ $167,000 project cost with $76,000 annual savings.
University of California, Irvine	▶ Used real-time air quality sensing to vary ventilation rates based on pollutant levels. ▶ Operate at 2 ACH to 4 ACH under normal conditions. ▶ Increase to 12 ACH when approaching pollutant threshold levels.
University of Colorado Boulder	▶ Used performance-based approach incorporating lab safety protocol, spill risk analysis, and hazard classification. ▶ Achieved 4 ACH in low hazard labs and 6 ACH in high hazard labs. ▶ $60,000 annual savings with 2 years simple payback.

Members

Arizona State University
Clark Atlanta University
Cleveland Clinic
Cornell University
Duke University
Grand Valley State University
Stanford University
Tulane University
University of California, Berkeley
University of Colorado, Boulder
University of California, Davis
University of California, Irvine
University of Maryland
University of Pittsburgh Medical Center

Energy Management Information Systems

Energy management information systems (EMIS) are a broad family of tools and services used to manage building energy use. EMIS includes energy information systems (EIS), equipment-specific fault detection and diagnostic systems, benchmarking and utility tracking tools, and building automation systems. Technologies such as EIS have enabled energy savings up to 10%–20% with simple paybacks of about 1–3 years.[59] Members of the EMIS Team improve the operational efficiency of their buildings by implementing EMIS and sharing best practice application experiences and insights. Learn more online at eere.energy.gov/betterbuildingsalliance/EMIS.

"To realize savings you have to provide tools to enable people to measure their success—you can't put a price tag on that."

-Sheri Stanley, Beaverton School District

"Operators ended up considering it like a game… Everybody in the building got excited, and realized how powerful the tool was, and that it would really be used to save."

-Team activity participant

2013 HIGHLIGHTS

- Launched the EMIS Team, recruited participating members, and completed foundational activities.
- Conducted an investigation of EIS uses, procurement costs, and energy-saving benefits to inform the business case for adoption of EIS technology. Median site energy savings were 17%, and portfolio savings were 8%. Although capital projects were critical, participants reported that these savings would not have been possible without use of the EIS.
- Developed a consensus-based EMIS technology classification framework, aligned with current industry terminology and commercial EMIS offerings. This framework provides a common reference for Better Buildings Alliance members to understand key distinguishing factors and core attributes of different solutions within the family of EMIS technologies.
- Documented team members' use of building automation systems (BAS) and key barriers to implementing EIS.

WHAT TO EXPECT IN 2014

- A synthesis of existing EMIS resources including handbooks, metering specifications, best practice uses, market overviews and state of the technology assessments. A webinar 'crash course' to understand critical aspects of successful EMIS use will be provided and summary of resources will be posted to the EMIS Team webpage.
- A region-by-region overview of utility pilots, programs, and incentives that support EMIS implementation. First costs are often an implementation barrier. This region-by-region overview will help members identify resources and incentives offered through efficiency programs across the United States.

- EIS procurement support materials. These materials will be designed to streamline and support EIS procurement, potentially including templates for requests for proposals, bid selection, or guide specifications to define key requirements. Solution packages will be made available to members for use in technology implementation efforts.
- EMIS demonstrations and guest access to EMIS offerings of interest to team members. To support members in technology selection, EMIS offerings will be reviewed in webinar demonstrations, and temporary 'guest' logins will be provided for more in-depth exploration of technology features.

The Business Case for Adoption: Costs and Energy Saving Benefits of EIS

In 2013, the Energy Management Information Systems Team published an analysis of EIS use from 26 organizations. EIS can enable energy savings of approximately 10%–20% by converting data into usable information and identifying operational inefficiencies. Additionally, EIS support continuous monitoring and performance tracking, commissioning, and persistent savings. In best practice applications, simple paybacks of about 1–3 years are achievable.

Currently, few building technologies are as heavily marketed or publicized as EIS, but adoption remains low due to two critical barriers: 1) lack of information on technology costs and associated energy and cost savings; and 2) limited understanding of how the technology can be used for maximum benefit. In response to these barriers, the EMIS Team conducted an investigation of EIS use to quantify and document technology costs and associated energy management and savings benefits.

Over two dozen organizations contributed information to inform the business case for EIS technology adoption. Participants achieved annual median site savings of 17% and portfolio savings of 8%. They reported that although capital projects were critical, these reductions would not have been possible without the use of the EIS. Median 5 year software costs (excluding hardware) were calculated to be $150,000, or $0.06 per square feet, and $1,800 per monitored point. The median implementation size comprised about 200 monitoring points and 300 million square feet.

Analyses showed that submetering was associated with larger energy savings within the study cohort. The Better Buildings Alliance Wireless Meter Challenge (read more on page 28) is expected to result in products that reduce the costs of submetering by roughly an order of magnitude (target: less than $100) per point.

Use the detailed findings from this investigation to inform your organization's investment in EIS technology. Learn more online at eere.energy.gov/betterbuildingsalliance/emis.

Members

Beaumont Health System
Best Buy
Boston Market
Energy Efficiency Building Hub (EEB Hub)
Food Lion
Glenborough
Hospital Corporation of America
Jones Lang LaSalle
Kimco Realty
Legacy Health System
Lowe's Companies
Mayo Clinic
New York Presbyterian Hospital
PETCO Animal Supplies
PetSmart
Prudential Financial
Publix Super Markets
Staples
Summa Health System
Tishman Speyer Properties
University of California, Berkeley
University of Maryland Medical Center
University of Pittsburgh Medical Center
Walmart Stores
WaWa
Wendy's Quality Supply Chain Co-op

MARKET SOLUTIONS TEAMS

FINANCING & VALUATION

LEASING & SPLIT INCENTIVE

DATA ACCESS

WORKFORCE DEVELOPMENT

Market Solutions Teams

Commercially available technologies and operational best practices can help reduce commercial building energy use by 20% or more. However, building owners, managers, and tenants are frequently unable to take full advantage of energy efficiency benefits due to market barriers. For example, split incentives between tenants and landlords may reduce both parties' desire to invest in energy efficiency upgrades; difficulty securing financing may delay planned building improvements; or lack of transparent building energy data may impede efforts to benchmark buildings and identify opportunities for improvement. Members of the Market Solutions Teams collaborate with DOE and the wider commercial building marketplace to identify solutions to help overcome these non-technical barriers. The team also works with DOE and external industry partners to increase the speed and scale at which they can improve adoption of building efficiency resources in the market.

2013 HIGHLIGHTS

- Helped launch the successful Better Buildings Webinar Series, which provides a platform for Better Buildings Challenge Implementation Models and other successful strategies to be promoted to Alliance members and the broader commercial sector.
- Released a strategic overview of energy efficiency financing barriers, existing solutions, and resources currently available to commercial building owners, managers, and tenants.
- Held four Building Re-Tuning trainings in Arlington, Virginia; Atlanta, Georgia; Berkeley, California; and Philadelphia, Pennsylvania. Also developed a case study on a Re-Tuning Training participant, Vornado Realty Trust.

WHAT TO EXPECT IN 2014

- Expanded Better Buildings Webinar Series as a means to promote implementation models and encourage uptake across Better Buildings Alliance member organizations.
- Support for the Better Buildings Data Accelerator to engage leading commercial sector property owners/operators in productive collaboration with participating cities and utilities.
- Rollout of the Green Lease Leaders recognition program and resources to help drive the adoption of green leasing in the industry.

Members

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
AtSite
Beaumont Health System
Building Owners and Managers Association (BOMA) International
CBRE
CC Frost Properties
Colliers International
Community Services Agency & Development Corporation
Cushman & Wakefield
Denver West
Energy Efficiency Building Hub (EEB Hub)
First Potomac Realty Trust
Glenborough
Green Parking Council
International Facility Management Association (IFMA)
InterContinental Hotels Group
Kilroy Realty Corporation
Kimco Realty
Liberty Property Trust
Living City Block
Newmark Grubb Knight Frank Global Corporate Services
PETCO Animal Supplies
Prologis
Prudential Financial
Retail Leaders Industry Association (RILA)
Rosemont Realty
RREEF Real Estate
Starbucks Coffee Company
Stream Realty Partners
The JBG Companies
Tishman Speyer Properties
Transwestern
USAA Real Estate Company
U.S. Department of Veterans Affairs
U.S. General Services Administration
U.S. Navy CNIC Facilities and Acquisitions

Financing & Valuation

The Financing & Valuation Team focuses on identifying and developing resources to help building owners and operators overcome barriers to investing in energy efficiency measures at scale. While efficiency investments often have good financial returns, they may not move forward because their full value is not recognized or captured by all parties involved in the transaction. The goal of the Financing & Valuation Team is to ensure that the financial benefits of energy efficiency are valued properly and incorporated into all relevant aspects of a building's investment decision-making processes. Learn more online at eere.energy.gov/betterbuildingsalliance/finance and eere.energy.gov/betterbuildingsalliance/appraisals.

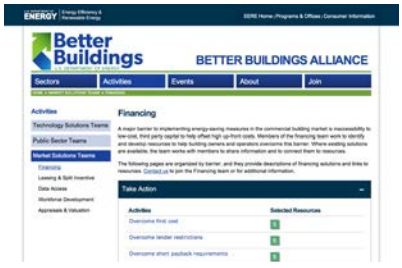
2013 HIGHLIGHTS

The team focused on four low-cost, high-impact strategies and developed the following guides and resources to facilitate implementation by members in 2013. These activities came out of a Memorandum of Understanding between the DOE and The Appraisal Foundation to collaborate on efforts that ensure the current appraisal standards are applicable for energy performance and green valuations.

- Updated the Better Buildings Alliance Financing webpage to include a strategic overview of energy efficiency financing barriers, existing solutions, and resources currently available in the market. These resources are now available on the Better Buildings Alliance website.
- Conducted a review of over 40 research reports on energy efficiency's contribution to building financial performance, such as rents, occupancy, and building value, and identified gaps that Better Buildings Alliance members and DOE may be able to jointly explore (publication forthcoming).
- Initiated an analysis of equipment replacement decisions, including a study in coordination with members to understand real-world data (as opposed to book-life data) on the useful life of key end-use energy equipment.
- Members helped review a "First Exposure Draft" of The Appraisal Foundation's (TAF) voluntary guidance document, Valuation of Green Buildings: Background and Core Competency. The document describes the qualifications appraisers should possess in order to value green buildings.

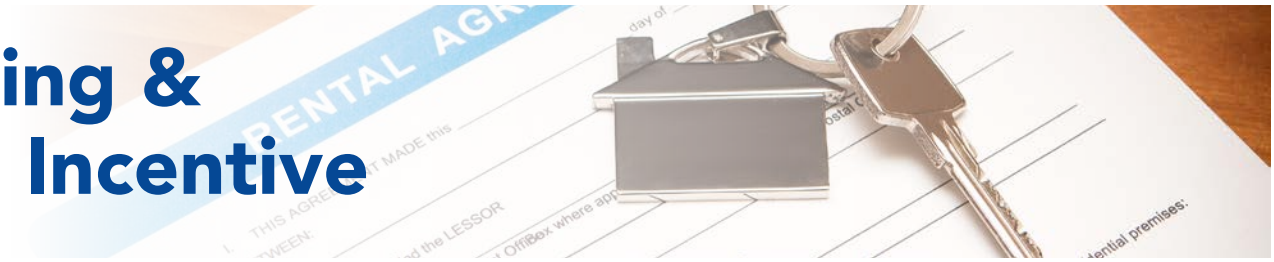
WHAT TO EXPECT IN 2014

- Continued efforts to quantify the impact of energy efficiency measures on building-level financial results, including expanding studies focused on:
  - Publication of a briefing book that summarizes existing research on energy efficiency's contribution to the financial performance of commercial buildings.
  - Analysis of the factors that influence equipment retirement decisions, including the impact of tax depreciation treatment. By analyzing numbers on replacements and retrofits, unit age, unit lifetime (expected and actual), unit cost, energy saved, square feet covered, climate zone, and building type, the Financing Team will create a study that aids decision-making for members on equipment retirement. Collection, analysis, and comparison of this data will provide useful information to help building owners/managers make the decisions to optimize equipment replacement timing—thereby saving energy and money.
  - Expanded work on energy efficiency financing mechanisms and building valuation practices.



Visit the Better Buildings Alliance's Financing Team webpages to learn more about resources, opportunities, and upcoming team events.

Leasing & Split Incentive



Green leasing (also known as energy-aligned, high performance leasing or energy-efficient leasing) aligns benefits for landlords and tenants to work together to save money, conserve resources, and ensure the efficient operation of buildings. These contractual arrangements serve as a powerful mechanism to assist the industry in responding to market pressures and to increase energy efficiency of building stock.

In 2012, the Market Solutions Teams coordinated with seven partner organizations to create the Green Lease Library to make resources more accessible to a myriad of audiences—from building owners and tenants to lawyers and building raters. Over the past year, the library grew to become the leading resource for green leasing information on the Internet.

In 2013, the Market Solutions Teams partnered with the Institute for Market Transformation and organizations supporting GreenLeaseLibrary.com to create the "Green Lease Leader" recognition program. Guided by an industry advisory board and supported by leading industry organizations, this program increases the visibility and importance of green leasing and drives its adoption in the market by recognizing those who have had successes in this space. The program will be open to applicants in early 2014 and the first class of awardees will be recognized in late spring 2014. In the coming year, the industry advisory board will help to create resources that offer guidance and tools to drive the adoption of green leasing in the industry. Learn more online at eere.energy.gov/betterbuildingsalliance/leasing.

2013 HIGHLIGHTS

- Formed an advisory board of leading industry organizations to inform the development of a green leasing recognition program.
- Led the Green Lease Library to become the number one leading resource for green leasing information on the internet.

WHAT TO EXPECT IN 2014

- Launch of the Green Lease Leaders recognition program and the first class of awardees.
- Resources to help drive adoption of green leasing.

GREEN LEASING INDUSTRY ADVISORY BOARD

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Jerome Montrone, Beacon Capital
Brad Molotsky, Brandywine
Evan Tyroler, Cassidy Turley
Michael Alexander, Cassidy Turley
Elizabeth Vasatka, City of Boulder, CO
John K. Scott, Colliers International
Anthony Guma, CoStar
Eric Duchon, Cushman & Wakefield
Adam Sledd, Institute for Market Transformation
Deb Cloutier, JDM Associates
Jack Shulman, the Kalikow Group
Will Teichman, Kimco Realty
Marla Thalheimer, Liberty Property Trust
Lisa Colicchio, CB Richard Ellis
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Adam Siegel, Retail Industry Leaders Assoc.
Mason Sharpe, Sharpe Properties
Geoffrey Kasselman, SIOR, Op2mize
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Kristen Taddonio, U.S. DOE

Data Access

Easy access to whole-building energy consumption data is a prerequisite for benchmarking and other analyses of building energy performance. However, the process for obtaining this information, as well as the format in which this information is provided, is not consistent across the country. This has been cited as a barrier for organizations seeking to benchmark their energy performance across large, national portfolios.

This issue is further compounded in the case of multi-tenant properties, where the building owner/operator is responsible for benchmarking but the tenant spaces are metered directly. In such cases, individual tenants receive bills and the building owner/operator must obtain and aggregate multiple billing records in order to benchmark the building as a whole. While some utilities have agreed to provide building owners with aggregated, whole-building data in the absence of explicit tenant authorization, this approach has not been universally accepted due to customer privacy considerations.

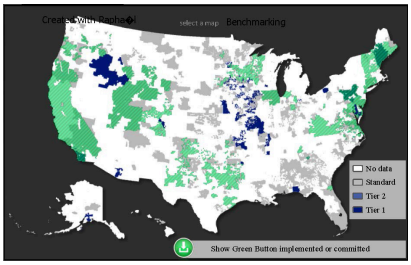
The Data Access Team is working to inform Better Buildings Alliance members about the wide array of initiatives aimed at facilitating access to building performance data, in order to drive benchmarking and other forms of energy performance analysis that serve as the foundation for strategic energy management. Learn more online at eere.energy.gov/betterbuildingsalliance/data.

2013 HIGHLIGHTS

- Launched the Data Access initiative as a team under Market Solutions.
- Promoted the State and Local Energy Efficiency Action (SEE Action) Network resource, A Utility Regulator's Guide to Data Access for Commercial Building Energy Performance Benchmarking, as a resource for Alliance members seeking to engage with utilities and policy makers to drive greater access to whole-building energy consumption data.
- Developed and coordinated a panel presentation on Data Access at the 2013 Efficiency Forum. This provided a national overview of efforts to streamline access to commercial building energy data, highlighting the efforts of three Better Buildings Alliance members, Liberty Property Trust, the Institute for Market Transformation, and the Energy Efficient Buildings (EEB) Hub.
- Delivered the inaugural session of the Better Buildings Webinar Series, with a presentation highlighting the SEE Action Data Access paper, as well as a Philadelphia case study with speakers from Liberty Property Trust, the EEB Hub, PECO, and the Pennsylvania Public Utilities Commission.
- Drafted and published a case study on the collaboration between building owners/operators, local policy makers, utility representatives, and utility regulators to develop a data access solution for commercial buildings in Philadelphia.
- Supported the launch of the Energy Data Accelerator, a program that pairs cities and utilities to provide building owners with greater access to whole-building energy data so they can more easily benchmark building energy performance.

WHAT TO EXPECT IN 2014

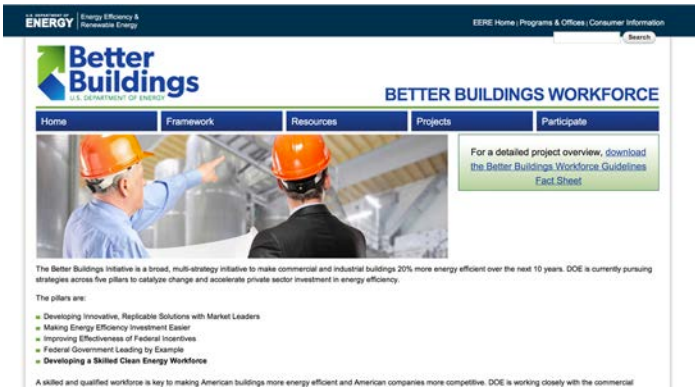
- Develop case studies and webinars that highlight the coordination between commercial building owners/operators, utilities, policy makers, and regulators to achieve new solutions to data access challenges.
- Coordinate with other Market Solutions Teams, such as Leasing & Split Incentive, to explore the potential for landlords to require tenants to provide energy data as a component of standard lease language.



Use the Utility Data Access Map at en.openei.org/wiki/OpenEI:Utility_data_access_map to track electricty policies.

Workforce Development

In 2013, DOE announced the Better Buildings Workforce Guidelines initiative to improve the quality and consistency of commercial building workforce training and certification programs for five key energy related jobs: Energy Auditor, Commissioning Professional, Building/Stationary Engineer, Facility Manager, and Energy Manager. This larger project provides the backdrop for the Market Solutions Teams' ongoing efforts to help members identify resources and strategies to recruit, retain, and develop a top-notch energy efficiency workforce. Learn more online at buildings.energy.gov/workforce.



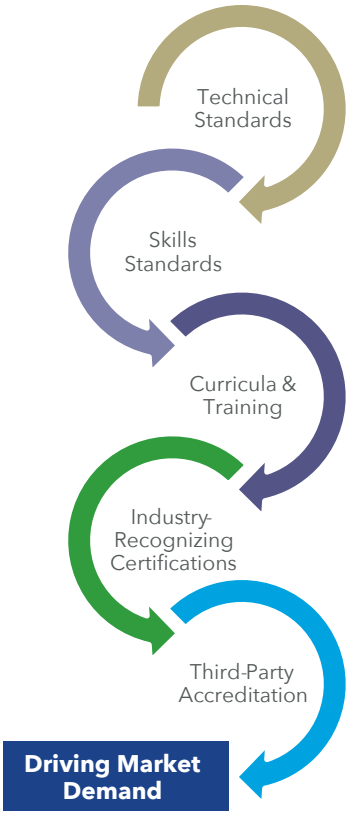
Visit the Better Buildings Workforce webpages to learn more about resources, opportunities, and upcoming team events.

2013 HIGHLIGHTS

- Conducted four re-tuning trainings in Arlington, VA, Atlanta, GA, Berkeley, CA, and Philadelphia, PA.
- Collaborated with the Workforce Development Team to help shape long-term workforce training activities, including coordination with public and private sector industry stakeholders to improve the quality and consistency of the commercial buildings workforce.
- Assisted in the development of the Better Buildings Workforce website, and supported DOE's efforts to work with the commercial buildings industry and other Federal agencies to develop training tools, materials, and voluntary credentialing guidelines to advance different elements of the Better Buildings Workforce Framework.

WHAT TO EXPECT IN 2014

- Coordinate with re-tuning training partners such as the National Institute of Science and Technology Manufacturing Extension Partnership (NIST MEP) to pilot the Building Construction Technology Extension Program (BCTEP).
- Coordinate with DOE's broader Workforce Development initiative to identify and implement new activities and promote opportunities for engagement and involvement of Better Buildings Alliance members.



DOE works with public and private sector industry stakeholders to strengthen and align the six elements of the Better Buildings Workforce Framework.

INCREASING PROGRESS IN THE PUBLIC SECTOR

PUBLIC SECTOR SOLUTIONS TEAMS

ENERGY SAVINGS PERFORMANCE CONTRACTS

STRATEGIC ENERGY PLANNING

DATA MANAGEMENT APPROACHES

FINANCE STRATEGIES

Public Sector Solutions Teams

State and local government agencies spend more than $10 billion per year on energy to provide public services and meet constituent needs.[60] As states, local governments, and school districts grapple with tightening budgets, many are looking to energy efficiency as an opportunity to stretch limited resources.

Public sector organizations now have the opportunity to work collaboratively with the DOE to achieve their energy efficiency goals. By joining the Better Buildings Alliance, states, local governments, and K–12 school districts can lead by example, achieve substantial energy cost savings across their facilities, and demonstrate energy and environmental leadership while expanding their skills with guidance from DOE experts and thoughtful peer exchange. Members commit to annual energy savings goals and participate in Public Sector Teams to build tangible, results-driven tools and capacities to maximize their organizations' effectiveness. Learn more online at eere.energy.gov/betterbuildingsalliance/publicteams.

2013 HIGHLIGHTS

- ▶ Launched the first four Public Sector Solutions Teams:
  - Data Management
  - Energy Savings Performance Contracting
  - Financing Strategies
  - Strategic Energy Planning

WHAT TO EXPECT IN 2014

- ▶ Adding additional members
- ▶ Continuing to work with public sector organizations to improve energy efficiency through four teams

Visit the Better Buildings Alliance's Public Sector Solutions Team webpages to learn more about resources, opportunities, and upcoming events.

Members

Alachua County Public Schools, FL
City of Cedar Rapids, IA
City of Charlottesville, VA
City of Davenport, IA
City of Jonesboro, AR
City of Santa Monica, CA
Mecklenburg County, NC
Oakland County, MI
South Washington County Schools, MN

Energy Savings Performance Contracts

Energy Savings Performance Contracts (ESPCs) have proven successful in achieving comprehensive energy efficiency upgrades in existing public buildings with little to no upfront capital. However, barriers persist in the accelerated adoption of ESPCs, and there continue to be missed opportunities to save on energy and operating costs. The ESPC Team assists organizations in achieving energy and environmental goals, reducing maintenance burdens, eliminating costly emergency repairs, increasing worker productivity, and stabilizing operations budgets. Public sector professionals who are considering ESPCs should understand every aspect of a typical ESPC process. The team aims to address persistent challenges and barriers to implementing successful ESPC in building energy efficiency programs, and welcomes members who have the responsibility for maximizing and leveraging funds for energy efficiency upgrades.

2013 HIGHLIGHTS

- Reviewed a five-step approach to planning and executing a successful performance contract.
- Provided tools to enable contract managers to consider and develop a Life of Contract Plan to assist with project administration, track performance and accountability for savings, and communicate project success.
- Established a forum where practitioners share challenges and successes of real-world experiences.

Strategic Energy Planning

The Strategic Energy Planning Team equips participants with the knowledge, tools, peer-exchange insight, and expert feedback needed to develop strategic energy plans for their communities. DOE guides participants through each step of the plan development process with the aid of a comprehensive planning guide, associated tools, and a series of monthly web-based meetings. At these meetings, group members report on progress and learn from each other, discussing on-the-ground challenges and solutions. DOE and the National Renewable Energy Laboratory (NREL) provide facilitation and coaching throughout the process.

2013 HIGHLIGHTS

- Released the updated Guide to Community Energy Strategic Planning.
- Initiated a series of monthly meetings to help members complete the following objectives:
  - Identify and engage stakeholders on how to develop an energy vision.
  - Assess their current energy framework.
  - Develop energy goals and strategies.
  - Prioritize actions.
  - Identify financing and funding opportunities.
  - Develop an implementation and ongoing evaluation plan.

Data Management Approaches

The Data Management Approaches Team focuses on critical elements needed to benchmark energy use across a portfolio of buildings. Receiving expert coaching and facilitation from DOE and peers, members discuss the mechanics for tracking and benchmarking building energy use and have the opportunity to execute benchmarking concepts discussed during team meetings. The group will develop skills for energy management and energy program decision making. The group will also benefit from dynamic peer exchange regarding on-the-ground challenges, solutions, and unique approaches to the data management process.

2013 HIGHLIGHTS

- Initiated a series of monthly meetings to help members:
  - Engage stakeholders and garner support from leadership.
  - Organize building and meter inventories.
  - Develop data collection requirements.
  - Establish analysis strategies.
  - Perform basic data validation.

Finance Strategies

The Finance Strategies Team focuses on helping public entities develop finance strategies for their building portfolio. Members of this team identify a tangible energy efficiency finance outcome they are hoping to achieve (e.g., to finance a suite of public projects), and technical experts lead monthly, web-based discussions focusing on possible options and best practices in design and implementation.

2013 HIGHLIGHTS

- Released a guide to Finance Energy Upgrades for K-12 School Districts, which lays out a range of strategies that are applicable for all public sector entities.
- Initiated a series of monthly meetings to help members:
  - Define the scope of their financing strategies.
  - Examine specific financing options and determine the best options.
  - Develop a plan to successfully obtain approval from decision makers.

Conclusion

2013 was an inspiring year for energy efficiency goals and projects. DOE applauds Better Buildings Alliance members for driving colleagues and industry peers to set ambitious energy reduction goals and helping move our country closer to 20% energy savings in commercial buildings.

Across the public and private sectors, Better Buildings Alliance members helped speed energy innovation through product challenges and market adoption campaigns. Members also made strides in reducing their portfolio's energy use, with partners averaging 2% savings over the past year.[2]

In 2014, the Better Buildings Alliance Team is committed to helping members identify cost-effective energy efficiency projects and evolving program offerings to meet market needs. Together, we can achieve our goal of improving energy efficiency in the commercial building sector by 20% over the next decade.

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Endnotes

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www.eere.energy.gov
www.eere.energy.gov/buildings/betterbuildings

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