



Moving Our Nation Forward, Faster Progress Report 2016

Better Buildings Progress Report 2016

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Moving Our Nation Forward, Faster

Through the Better Buildings Initiative, the Department of Energy (DOE) is working with leading organizations across the country to increase investment in energy efficiency and reduce energy bills, while avoiding carbon and other pollutants. Over five years, it has more than tripled in scope, influence, and impact. The Initiative is transforming the energy efficiency marketplace by targeting the barriers that prevent many organizations and consumers from capturing the benefits of energy efficiency.

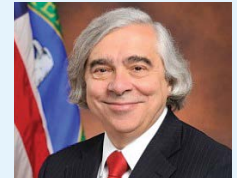
In 2011, 60 organizations, representing almost 2 billion square feet of building space, took President Obama's Better Buildings Challenge to improve the efficiency of their building portfolios by 20% or more. The federal government committed to a goal of \$2 billion in third-party financing, and the finance community committed to \$2 billion in energy efficiency financing. Today, more than 310 organizations representing 4.2 billion square feet and 1,000 industrial facilities have taken the Better Buildings Challenge, and public and private sector financing commitments total well over \$10 billion. DOE has joined with the Department of Housing and Urban Development (HUD) and the multifamily housing industry to grow the effort. In all, 60 new partners joined the Challenge just in the last year.

Partners are demonstrating savings of more than 2% each year. They are on track to hit their 20% savings targets across many types of building and facility portfolios, saving more than \$1.3 billion since the start of the program. That's 160 trillion Btus in energy savings and 10 million tons of avoided carbon emissions. These savings are derived largely from the more than 5,500 properties where partners are reporting 20% or more savings, and the 12,600 properties where they are reporting 10% or more savings. Further, Financial Allies have extended \$5.4 billion in financing for efficiency projects, and other efforts have extended an additional \$4.3 billion in financing.

Better Buildings partners are also delivering on their commitment to share their proven strategies. The Better Buildings Solution Center now has more than 400 replicable strategies for overcoming barriers to efficiency, and achieving deep savings in individual properties and across broad portfolios. All solutions are easily searchable by topic, building type, sector, technology, location, and more.

In 2016, the first Better Buildings Challenge SWAP was released. Hilton Worldwide and Whole Foods Market engaged in a new and highly accessible form of inter-industry collaboration, as energy experts from each organization

"This report showcases another year of remarkable progress for the Better Buildings Initiative as it expands to include new partners, solutions, and an even broader network of energy efficiency leaders. Better Buildings partners are committed to creating energy savings through the use of innovative technologies and organizational strategies that drive American job growth and help reduce carbon emissions."



Energy Secretary Ernest Moniz

worked together on camera to unveil energy saving opportunities in each other's buildings. It has proven to be a great way to raise the profile of energy efficiency, and the solutions offered through Better Buildings.

The Better Buildings Initiative continues to focus on four key strategic areas:

Developing Innovative, Replicable Solutions with Market Leaders. A diverse network of organizations and companies partner with DOE to replicate gains in energy efficiency through the exchange of proven strategies and approaches. These solutions are available on the Better Buildings Solution Center, and are collectively helping to make America more energy efficient.

Making Energy Efficiency Investment Easier. The Energy Department is making it easier than ever to accelerate energy efficiency investment through better information and tools to assess a building's efficiency, savings opportunities and financing options.

Federal Leadership by Example. The federal government is making progress in its commitment to identify new opportunities to save taxpayer dollars, reduce energy and water costs, and cut harmful pollution through the use of energy performance contracting.

Developing a Skilled Clean Energy Workforce. DOE works closely with the commercial buildings industry and other federal agencies to develop training tools, materials, and voluntary credentialing guidelines.

Better Buildings Initiative: 2016 Update



Developing Innovative, Replicable Solutions with Market Leaders

► Better Buildings Challenge

The President's challenge to CEOs, university presidents, state and local government leaders, and building owners to help lead the country to 20% energy savings over 10 years; more than **310** organizations spanning more than **4.2 billion** sq. ft. of building space have taken this leadership challenge

► Better Buildings Alliance

More than **200** organizations representing over **11 billion** sq. ft. have joined this collaborative effort to develop high impact technical and market solutions for improved energy efficiency in commercial buildings

► Better Buildings, Better Plants

170+ industrial companies representing over 11% of the U.S. manufacturing energy footprint participate in this voluntary program to reduce energy intensity, typically by 25% over 10 years

► Better Buildings Accelerators

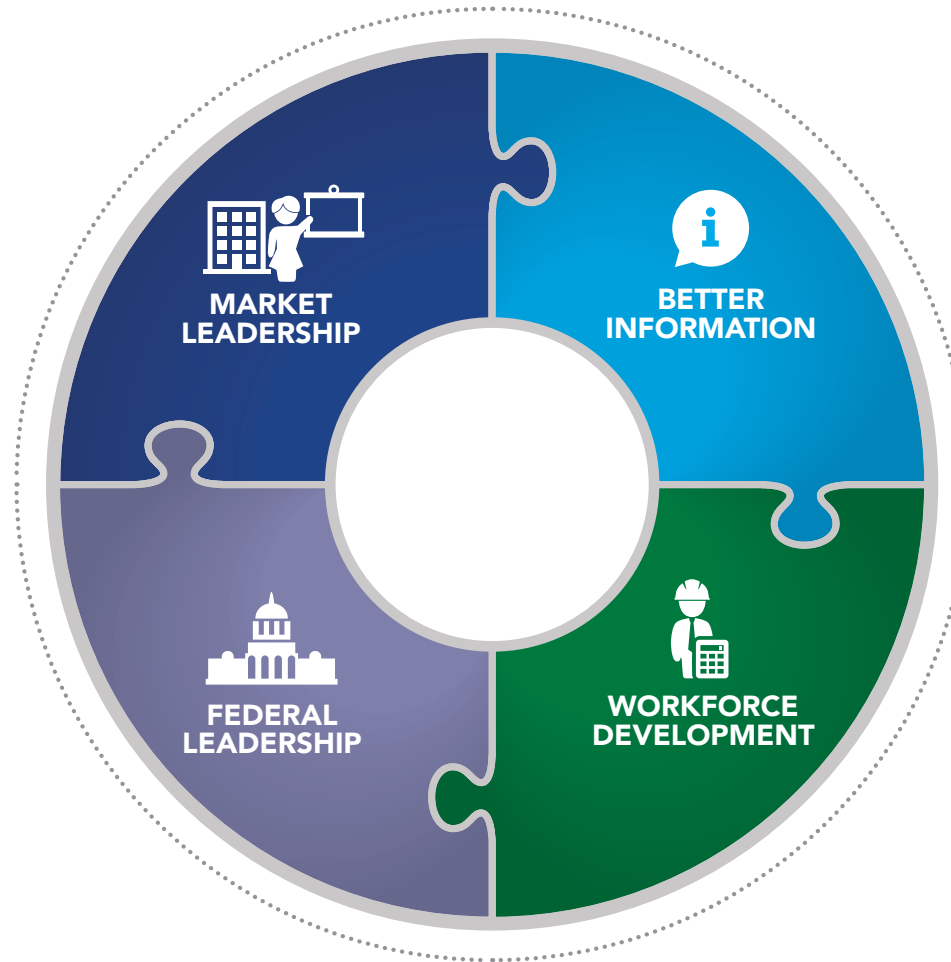
Since 2013, **10** Accelerators have been launched, and **130** organizations are overcoming common challenges to energy efficiency; the Energy Data Accelerator is the first of these to successfully complete its mission

► Better Buildings Residential

Working with stakeholders to increase the number of high-performing, energy-efficient homes in the U.S. and make credible home energy information readily available at point of sale

► Superior Energy Performance

Providing a market-based solution for certifying manufacturing and commercial facilities that have demonstrated energy management excellence through conformance with the ISO 50001 standard and sustained energy performance improvement of up to 30% over 3 years



Leading by Example in the Federal Government

► New Executive Order

Extends federal goals through 2025 with targets of 40% reduction in GHG emissions, 30% increased use of renewable electricity, and 25% improved building efficiency by 2025. (Executive Order: 13693)

► President's Performance Contracting Challenge

Agencies have contracted for **\$2.6 billion** toward a \$4 billion performance contracting goal to improve the sustainability of federal facilities

► DOE Leadership

DOE has reduced its GHG emissions by **33%** compared to the 2008 baseline year, surpassing its 2020 target and on pace to meet its 2025 target of 50% reduction



Developing a Skilled Clean Energy Workforce

► Better Buildings Workforce Guidelines

The Association of Energy Engineers' (AEE) Certified Energy Manager® is the first commercial building certification program to be recognized, with other programs in the process of being accredited to meet guideline standards

► Energy Management System (EnMS) Certifications

The Superior Energy Performance (SEP) Certified Practitioner in EnMS are qualified experts who help companies implement ISO 50001 and SEP. Additionally, SEP Lead Auditors and Performance Verifiers are qualified experts who conduct SEP audits for companies seeking third-party SEP certification.



Making Energy Efficiency Investment Easier

► Better Buildings Solution Center

400 solutions are available publicly in the Better Buildings Solution Center, making it easy to access proven energy and water strategies

► Financing Navigator

An online tool set to launch in 2016 will let building owners easily compare options for financing their efficiency projects

► Improved Data Consistency and Access

Building Performance Database (BPD): The largest database of information to help compare the physical and operational characteristics of real buildings; over **10,000** users have input data on **870,000** buildings

Building Energy Data Exchange Specification (BEDES):

A dictionary of **600** terms and definitions to facilitate consistent exchange of information on building characteristics and energy use; there are 13 applications to date that are BEDES compliant or in the process of becoming BEDES compliant

► Tools to Assess the Efficiency of Buildings/Homes

Building Energy Asset Scoring Tool:

800+ buildings have been scored using this tool across 30 states totaling over **80 million** square feet; DOE also launched the Asset Score National Leadership Network with 17 leading organizations that have pledged to use the Asset Score on their buildings

Home Energy Score:

With more than **38,000** homes scored to date, this tool helps homeowners and homebuyers understand how much energy a home is expected to use and provides suggestions for improving its energy efficiency

Better Buildings Challenge: Year in Review

In the past year, the Better Buildings Challenge continued to grow as a platform for market leaders to demonstrate their commitment to make homes, buildings, and industrial facilities across the country at least 20% more energy efficient over 10 years. There are now more than 310 organizations from diverse sectors that have stepped up to the Better Buildings Challenge representing over 4.2 billion square feet of building space, more than 1,000 industrial facilities, and \$5.5 billion in capital committed to financing. Through this program, partners are creating and sharing real solutions that reduce energy and water consumption, create jobs, and save money.

Improving Buildings and Demonstrating Savings

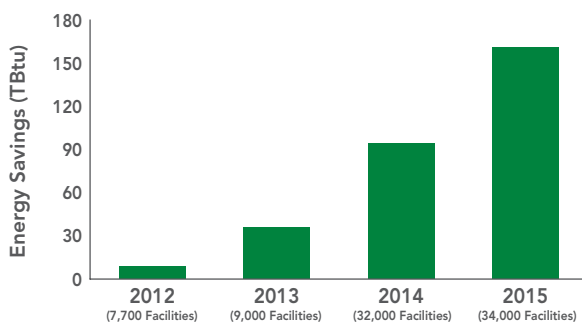
As of 2015, 135 partners shared energy performance results for more than 34,000 properties. They are demonstrating energy savings of 20% or greater at more than 5,500 properties across all 50 states, and 10% or more at 12,600 properties. On average, partners in the Better Buildings Challenge are now saving more than 2% per year, and are on track to meet their energy savings goals of 20% over 10 years. Since the program's launch in 2011, partners have cumulatively saved 160 trillion Btus and an estimated \$1.3 billion.

Better Buildings Challenge Partner Progress and Cumulative Results

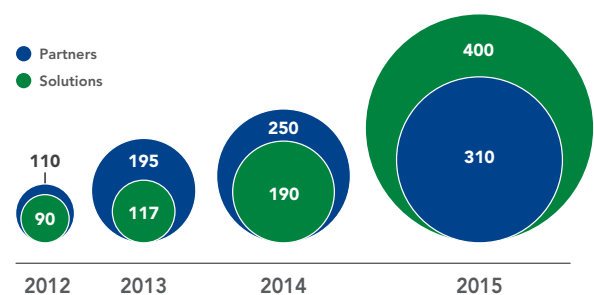
Results	2014	2015
Energy Saved (Btus)	94 trillion	160 trillion
Dollars Saved	\$840 million	\$1.3 billion
Avoided CO ₂ Emissions (tons)	5.8 million	10 million
Funding Committed	\$5.5 billion	\$5.5 billion
Funding Extended	\$3 billion	\$5.4 billion
Water Savings (gallons)	375 million	2.3 billion
Solutions		
Partner Solutions Available Online	190+	400+
Partners		
Number of Partners and Allies	250+	310+
Square Feet Represented	3.5 billion	4.2 billion

Since the program's launch in 2011, partners have cumulatively saved 160 trillion Btus and \$1.3 billion.

Cumulative Energy Savings by Year



Better Buildings Challenge Program Growth



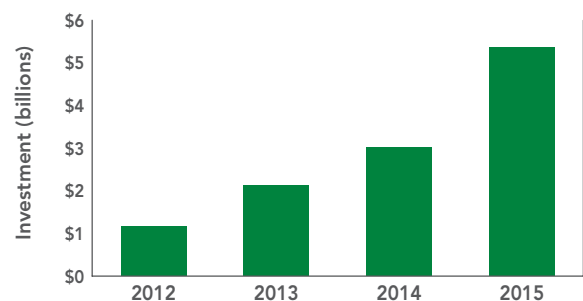
Partners Sharing Solutions

There are now over 400 solutions publicly available in the Better Buildings Solution Center, an online tool designed to help organizations easily find proven energy and water efficiency approaches by topic, building type, sector, technology, and location. These solutions demonstrate how advanced technologies, organizational strategies, and partnerships with financiers and utilities are moving energy efficiency forward across key market sectors. Of these solutions, there are more than 150 showcase projects featuring individual properties, with completed projects achieving an average energy bill reduction of 27%. There are also more than 100 partner implementation models that address important energy efficiency market barriers, ranging from how partners fund projects, to utility collaboration strategies, to innovative real-time energy management systems for monitoring building energy use.

Financing More Efficiency Projects

Energy efficiency financing among Better Buildings Challenge Financial Allies has also grown significantly. Since 2012, the allies have cumulatively funded more than \$5.4 billion across a diverse range of sectors and technology types. Each year, the allies have funded an additional \$1.4 billion on average, with particularly strong growth of \$2.4 billion in 2015 that tracks with overall market expansion. The chart to the right shows cumulative investment in energy efficiency projects by Financial Allies over time.

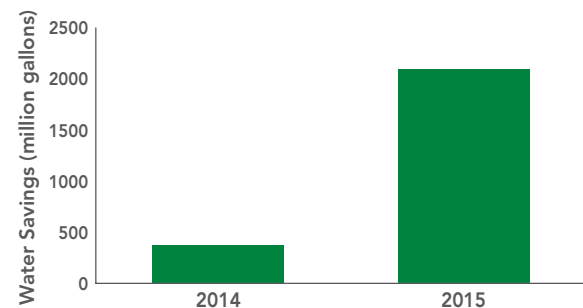
Cumulative Financial Ally Investments by Year



Setting Water Savings Goals

The program's water expansion took hold in 2015, and there are now more than 30 partners who have added a water savings commitment to their energy commitment. The commercial and industrial sectors alone account for more than 25% of the withdrawals from public water supplies, and many organizations in these sectors may have savings opportunities of 20% to 40%. Program partners, including those in the public and multifamily sectors, are now sharing their successful approaches to saving water, and have cumulatively saved 2.3 billion gallons since 2014.

Cumulative Water Savings by Year



Getting the Word Out

Highlighting partner successes is a key part of the Better Buildings Challenge. In the past year, Better Buildings hosted 10 interactive webinars on important topics for leading businesses, manufacturers, local and state governments, and other practitioners to think about when integrating energy savings into their daily building operations activity. This popular series attracted over 2,000 attendees, and will continue in 2016 with a new line-up of topics and speakers. In addition, the Better Buildings Challenge SWAP provided a platform for partners to learn from one another in a new and engaging way, and has been viewed more than 430,000 times online.

Delivering Results: New Goal Achievers

This year, 11 partners achieved their energy goals and four achieved their water goals. Four Financial Allies also placed sufficient investments to meet their financing goals. There are now over 35 partners and allies that have achieved their energy savings, water savings or financing goals.

Energy Goal Achievers



NISSAN NORTH AMERICA

30%

Nissan North America's portfolio consists of three manufacturing plants. Their energy management activities are a part of the company's corporate social responsibility initiative. Nissan uses extensive sub-metering and monitoring equipment to benchmark and identify energy improvement opportunities. In addition, Nissan has achieved a 12.6% reduction in water usage since 2013, driven by new efforts to reuse water, new filtration efforts in its paint shops, and through improved employee engagement.



POUDRE SCHOOL DISTRICT (PSD)

25%

PSD, located in Fort Collins, Colorado, serves approximately 25,000 students and includes 50 schools totaling nearly 4 million square feet. PSD capitalized on a community-supported, \$120 million bond issued in 2010 for infrastructure improvements, including deep retrofits of HVAC, lighting, building envelope and water systems. PSD exceeded the program's goal, achieving 25% energy savings within five years, through its firm commitment to principles of sustainability in all of its operations.



VICTOR VALLEY WASTEWATER RECLAMATION AUTHORITY (VWVRA)

27%

VWVRA's portfolio consists of a regional wastewater treatment plant that processes approximately 13 million gallons of sewage per day. VWVRA has an aggressive approach to energy management that focuses on continuous improvement and optimal performance of energy-using applications. The company implements discrete projects like upgrading aeration blowers with variable speed control and generating biogas for cogeneration, and also participates in the water/wastewater treatment pilot for DOE's Superior Energy Performance program.



ARBY'S

24%

Arby's portfolio consists of more than 940 buildings and 2.7 million square feet. Since 2011, Arby's has improved energy performance by 24%. Energy savings have been achieved through the implementation of various lighting retrofits, HVAC upgrades, refrigeration and hot water efficiency measures, and an energy awareness program focused on helping sites implement low-cost opportunities for savings.



RIVER TRAILS SCHOOL DISTRICT 26

23%

River Trails School District, located in Mt. Prospect, IL, is comprised of three school buildings serving approximately 1,500 students from Pre-K through 8th grade. Their leadership in energy efficiency is demonstrated by ENERGY STAR® certifications and a U.S. Department of Education 2015 Green Ribbon School Award. The district joined the Challenge in 2015 and exceeded its goal early due to recent improvements in equipment, lighting, and energy management systems. Greater savings are expected through upgrades to the building automation systems, retro-commissioning, and outdoor lighting improvements.



EBAY, INC.

25%

eBay's commitment consists of six data centers located in Phoenix, Salt Lake City, and Denver totaling 36MW of IT capacity. Since 2012, eBay has improved the energy intensity of their data center portfolio by 25%. Improvements to achieve these savings include installation of new high-efficiency motors and variable speed drives in their computer room air handler units, and implementing control changes in their chilled water and air supply systems.



STATE OF DELAWARE

23%

The State of Delaware’s portfolio consists of over 200 buildings and 8 million square feet. Delaware is committed to benchmarking and tracking facility energy consumption of all state buildings, and implementing energy efficiency and renewable energy projects and state employee behavior change campaigns. Energy savings resulted from lighting and plumbing retrofits across many facilities, HVAC and building automation system upgrades in several others, and an energy awareness program focused on no-cost opportunities to reduce excess consumption.



THE HARTFORD FINANCIAL SERVICES GROUP, INC.

21%

The Hartford Financial Services Group’s portfolio consists of more than 2.4 million square feet of office space. Since 2013, The Hartford has improved its energy performance by 21% in only 2 years, exceeding its goal of 20% by 2023. Energy savings have been achieved by installing high efficiency cooling and lighting equipment, utilizing advanced building automation, upgrading elevator motor and control systems, and optimizing building occupant density.



HAVERTYS

22%

Havertys’ portfolio consists of more than 110 buildings and over 5 million square feet. With sustainability as a core corporate value, Havertys implemented its Bright Inspirations program, which includes comprehensive store energy upgrades and store manager engagement in ongoing energy reductions. These efforts have resulted in portfolio-wide energy savings of over 22% from a 2011 baseline.



INTUIT

21%

Intuit’s commitment consists of a 240,000 square foot stand-alone data center located in Quincy, Washington. Since 2012, Intuit has improved the energy intensity at the 4 MW facility by 21%. Energy savings have been achieved by installing a hot-aisle chimney containment system to improve ventilation, optimizing the temperature set points to reduce cooling load while maintaining performance, and implementing a secondary chilled water reset to reduce the chiller runtime.



CITY OF HILLSBORO, OR

21%

Hillsboro’s portfolio consists of more than 20 properties and 450,000 square feet. Since 2009, Hillsboro has improved energy performance by 21%. Energy savings have been achieved by implementing a new energy management plan that includes lighting retrofits, HVAC and controls upgrades at its three largest properties, and an energy management policies awareness program focused on low-cost opportunities for savings. Hillsboro has also achieved a 15% reduction in water usage since 2012.

Delivering Results: New Goal Achievers

Water Goal Achievers



CUMMINS, INC.

45%

Cummins has improved its water intensity by developing water balances to better understand water use and identify improvement opportunities, and by taking a broader view of water costs when making the business case for water-saving projects.



UNITED TECHNOLOGIES CORPORATION (UTC)

43%

UTC's water saving progress has been driven by an internal water guidance document, which details the company's global water scarcity assessment, best practices in managing water at individual sites, and water saving case studies.



POUDRE SCHOOL DISTRICT (PSD)

29%

PSD has established a culture of conservation to include academic programs, extracurricular activities and custodial services. Water conservation related to irrigation is particularly important due to a climate where periods of drought are common.



ATLANTA, GA

20%

Atlanta improved water performance by an average of nearly 5% from its baseline, making exceptional progress through implementation of high-efficiency plumbing fixtures, cooling tower upgrades, water reuse, leak detection, efficient irrigation and landscape design practices.

Financial Ally Goal Achievers



ENTERPRISE COMMUNITY PARTNERS

\$130 MILLION

Enterprise Community Partners provides expertise to developers, leads policy work, and makes grants to partners to help them strengthen their operations. The Enterprise family of companies shares a single mission: increasing access to affordable homes in thriving communities.



YGRENE ENERGY

\$100 MILLION

Ygrene Energy Fund offers PACE (Property Assessed Clean Energy) program design, administration, and funding for commercial and residential properties throughout the U.S.



COMMUNITY INVESTMENT CORPORATION (CIC)

\$25 MILLION

The CIC Energy Savers Program is a one-stop shop for multifamily residential retrofits—including energy assessment, technical assistance, and fixed-rate financing—located in the greater Chicago metro area.



CONNECTICUT GREEN BANK

\$25 MILLION

Connecticut Green Bank is the nation's first green bank. It strives to accelerate green energy adoption in Connecticut by making green energy financing accessible and affordable for homeowners, businesses, and institutions.

Previous Goal Achievers

An additional 18 partners met their energy or financing goals in previous years, and continue to maintain these savings, or have set new goals.

2014

AFL-CIO



UC Irvine

2015

3M



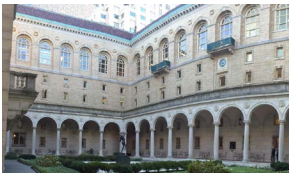
VOLVO

Developing Innovative Solutions

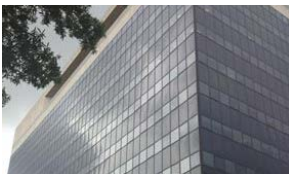
Information fuels decision making, which is why a diverse network of organizations and companies partner with DOE to replicate gains in energy efficiency through the exchange of proven strategies and approaches to energy efficiency. These solutions are made readily available to other organizations on the Better Buildings Solution Center in a way that helps move the market forward and collectively make America more energy efficient.

Showcasing Real Projects

Better Buildings Challenge partners demonstrate what's possible in individual facilities by highlighting their innovative, multi-measure approaches to energy efficiency. These leaders set ambitious goals for their showcase projects, and then shared the strategies and technologies employed to meet them. To date, partners have shared the details about more than 150 showcase projects, with over 30 new projects added in 2015. On average, completed projects are achieving savings of 27%. Here are some of the latest projects completed by partners:



Boston, MA's Central Library at Copley Square, which opened in 1895, achieved energy savings of 25% and reduced annual energy costs by \$155,000 by installing a new energy management system that introduced optimal HVAC start and stop times based on outside air temperatures. It also integrated other energy-using systems into the building management's controls system, allowing greater control of the entire building's operation.



The State of Delaware's Carvel State Office Building project achieved 20% annual energy savings by working with an energy service company to implement a suite of energy conservation measures over a number of years. Energy efficiency measures included installing LEDs and lighting controls, upgrading the building automation system, optimizing the cooling tower, and more. All together, these measure are saving the state nearly \$250,000 a year.



Denver, CO's Richard T. Castro Building, which encompasses 307,000 square feet of office and public service space, leveraged a 30 kW solar array on the roof and energy efficiency improvements that included sealing the building envelope, upgrading the building automation system, installing four new high efficiency boilers, and utilizing variable frequency drives on HVAC units to reduce energy use by 37% and save \$99,000 annually.



JBG Companies' L'Enfant Plaza East, a complex encompassing 836,500 square feet of office and hotel space, reduced energy use by 31%, saving \$920,000 annually, by overhauling penthouse HVAC equipment, upgrading office lighting to high efficiency T5 or T8 lamps and ballasts, and installing the innovative LimeLight Twist wireless lighting control system in the parking garage.



Jersey City Housing Authority's Booker T. Washington Apartments are a set of nine three- and four-story brick buildings that provide 319 units of public housing. The Jersey City Housing Authority successfully completed Phase I of a broader project by implementing both energy and water efficiency measures that include temperature monitoring and controls throughout the complex, new steam traps and thermostatic radiator valves in apartment radiators, and more. Energy efficiency measures resulted in a 37% reduction in energy use, saving \$650,000 a year.



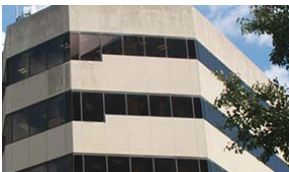
Michigan State University's Erickson Hall, a 220,000 square foot office and classroom facility, was a pilot project for an existing building commissioning program that identified and implemented energy conservation measures, such as sealing openings in plenums, converting to electronically controlled variable air volume systems, and recalculating heating and cooling loads to reduce maximum fan speeds, to achieve energy savings of 41% and cost savings of \$307,000.



Suncoast Credit Union reduced energy use by 85% and eliminated the electricity bill at its Bushnell Service Center by combining energy efficiency measures such as high efficiency LED lights, a new energy management system, low-emissivity coatings on exterior glass, and improved building insulation with a 40 kW polycrystalline solar PV installation on the roof that provides power to the building during business hours.



TIAA's 1001 Pennsylvania Avenue was an already high performing urban office building that was selected for further efficiency enhancements. New HVAC controls were installed and building pressurization, interior and exterior lighting were all improved. When aggregated, the projects yielded an overall payback period of 3.5 years and a return on investment of 29%.



Toledo, OH used its Property-Assessed Clean Energy (PACE) finance program to finance several energy efficiency upgrades. It installed an automated building control system with real time remote management capability and web-based operator interface, upgraded from T12 and incandescent lighting, and retrocommissioned building mechanical and electric systems in the 60,000 square foot One Maritime Plaza, achieving energy savings of 27% and cost savings of \$58,000. Additional benefits included improvement in overall building performance, and significant improvement in tenant comfort and productivity. The project also validated the benefits and success of the PACE program.



West Palm Beach, FL used a guaranteed energy savings performance contract to retrofit 5,352 city-owned street lights and 1,451 utility-owned street lights to more efficient LED and induction lights, which reduced energy consumption by 54% and saved \$160,000. The retrofits have also helped contribute to an 11% decrease in overall greenhouse gas emissions for municipal operations since 2008. Residents and businesses in these neighborhoods were pleased with the upgrade, as was the West Palm Beach Police Department because the lights provide increased luminance in previously poorly-lit areas.

Sharing Proven Strategies

Sharing strategies that work is a significant contribution of Better Buildings Challenge partners. Currently, there are more than 100 implementation models in the Better Buildings Solution Center, including 30 new models shared in the past year. The implementation models listed below are examples of the real world solutions that partners are sharing to guide other organizations as they overcome barriers to greater energy efficiency.

How Can I Build Expertise within my Organization?



Learning Laboratory

BARRIER: A lack of common language and collective tools for sharing insights and comparing results of high-performance, sustainable, multifamily housing across building types and regions.

SOLUTION & OUTCOME: **Aeon** collaborated with key sustainability leaders to develop replicable blueprints and templates to support the collection and exchange of ideas and solutions that advance sustainability efforts across the country. Through the Learning Laboratory, the company developed a project communications blueprint, a shared language, and a shared framework for advancing green initiatives.



Plant Energy Program Assessments

BARRIER: Difficulty ensuring consistency with the company's Energy Management Systems (EnMS) by personnel at Darigold's 12 manufacturing sites.

SOLUTION & OUTCOME: **Darigold** established a corporate program to assess plant EnMS activities, putting in place a scoring system that provides incentives to meet specific requirements. The company showed improvements in 11 of 12 plants in 2014, exhibiting a strong correlation with energy efficiency improvements at those same plants.

How Do I Identify Energy Savings Opportunities?



Deutsche Asset
& Wealth Management

Project Energy Saver

BARRIER: Prioritizing and balancing the implementation of sustainability efforts across a building portfolio of high performance, and lower performance but high opportunity, assets.

SOLUTION & OUTCOME: **Deutsche Asset & Wealth Management** launched "Project Energy Saver" to consistently evaluate and improve facility energy performance through identification of energy conservation measures, operational improvements, and planning for capital projects across the building portfolio. This effort contributed to the company saving an average of over 4% a year across its portfolio since 2010.

How Do I Engage Key Stakeholders?



Sustainable Operations Plan

BARRIER: Lack of efficient collaboration between key municipal departments on means and methods to achieve their energy goals.

SOLUTION & OUTCOME: **Chula Vista, CA** created and implemented the City Operations Sustainability Plan, a cohesive strategy that enables city efforts to coordinate and accelerate sustainability initiatives throughout city operations. Chula Vista achieved a 24% reduction in energy consumption, saving an estimated \$270,000 annually.

HAVERTYS **Building Internal Support for Energy Efficiency Projects**

BARRIER: Lack of visibility and the sharing of benefits obtained through energy efficiency and sustainability projects.

SOLUTION & OUTCOME: **Havertys** integrated sustainability into its business model as a core company value, implemented a comprehensive store upgrade program, and engaged managers to participate in efforts to reduce energy use, contributing to portfolio-wide energy savings of 22% since 2011.



Supplier Efficiency Program

BARRIER: Needing to scale up efforts to help small- and medium-sized (SME) suppliers improve the energy efficiency of their plants.

SOLUTION & OUTCOME: **Johnson Controls** developed a standard and scalable program that provides SME suppliers with energy management tools, training, and on-site technical assistance. The company increased the number of suppliers trained to identify and implement low/no-cost energy efficiency improvements in their plants.



"Flip the Switch" Tenant Engagement Program

BARRIER: Difficulty engaging with building tenants to promote energy awareness, address split incentives, and increase participation in energy efficiency efforts in multi-tenanted buildings.

SOLUTION & OUTCOME: **Shorenstein Properties** designed the "Flip the Switch" comprehensive tenant engagement program to provide building occupants with actionable information to reduce energy use. The program contributed significantly to a portfolio-wide average energy use reduction of over 3% a year since 2008.



Tying Energy Costs to Building Occupants

BARRIER: Lack of framework for educating the school's students, faculty, and staff about the energy impacts of their behaviors, in an environment where utility costs are administered centrally.

SOLUTION & OUTCOME: **University of California, Berkeley**, developed the Energy Management Initiative (EMI) to target building occupants through surveys and energy dashboards, and allocate energy cost responsibility to individual campus operating units. The EMI has achieved savings of \$6.5 million, 58.7 million kWh and 893 thousand therms in just three years.

How Do I Pay For It?



King County

Fund to Reduce Energy Demand

BARRIER: Lack of dedicated financing for county agencies to implement cost-effective efficiency projects to meet reduction goals.

SOLUTION & OUTCOME: **King County, WA**, created the Fund to Reduce Energy Demand (FRED) to provide agencies a financing tool that supports achieving energy reduction and climate goals, which led to a \$2.5 million investment in energy and water efficiency projects that will achieve an estimated annual cost savings of \$250,000, and annual carbon dioxide reductions of 1,000 tons.



Hybrid Funding Approach Makes the Grade

BARRIER: Overcoming the perception of organizational risks associated with using the district's limited access to capital to complete energy efficiency projects.

SOLUTION & OUTCOME: **Portland Public Schools** established a hybrid energy savings performance contracting model to provide energy efficiency funding by combining Recovery Zone Economic Development Bonds for smaller, owner-managed projects. This achieved \$1.2 million in annual savings from completed projects, resulting in increased district and school board support for projects while teaching students and the community about environmental responsibility.



Least Cost Procurement Plan

BARRIER: Energy efficiency not viewed as a management priority.

SOLUTION & OUTCOME: **Rhode Island** established Least Cost Procurement as the guiding principle of energy planning in the state, prioritizing energy efficiency, which is cost-effective and less expensive than energy supply, as the state's "First Fuel." Within four years, Rhode Island's investment in energy efficiency tripled, and the state was third in per capita efficiency investment. Since 2008, Rhode Island consumers have saved \$2 billion on their energy bills, and the state has created more than 25,000 job-years of employment. Rhode Island has exceeded its energy savings targets for the last two years.

How Can I Motivate My Organization?

UC Irvine Empowering Managers to Help Teams Meet Big Goals

BARRIER: Challenges in moving past conventional wisdom to develop new strategies for achieving ambitious energy savings goals.

SOLUTION & OUTCOME: **University of California, Irvine's** Administrative and Business Services unit encourages risk-taking and the questioning of status-quo practices to produce results through an empirically derived technical and behavioral based performance improvement program. The university exceeded its 20% campus-wide energy reduction goal in 2014—7 years early—and is on track to meet a 40% reduction goal by 2020.

Saving Water & Energy

Water and energy use are closely connected. Because it takes a lot of energy to treat and transport water, water savings actions will almost always lead to energy savings. Beyond water savings strategies, there is also significant energy savings potential within the nation's water and wastewater treatment facilities. In 2015, the Better Buildings Challenge began addressing these issues in tandem by encouraging existing partners to set water saving goals in addition to their energy efficiency targets; and working with water and wastewater treatment agencies to reduce their energy consumption.

More than 30 partners have joined the Better Buildings Challenge water efficiency effort, with many already making significant progress. Cummins, for example, has reduced its water consumption by 45% since its baseline year. Shari's Cafe & Pies has improved by 30%, and Poudre School District by 29%. Several partners are also sharing their water saving solutions so others can follow their lead.

Seven water and wastewater treatment agencies have stepped up to the Better Plants Challenge and are showing their leadership by setting energy-efficiency goals and sharing successful strategies that result in real, proven savings. Water and wastewater treatment agencies account for 1.8% of the nation's total electricity consumption and face high energy costs as a proportion of total operating costs.¹ As a result, energy efficiency can have a big impact on this sector's bottom line.

Partners with Greatest Water Savings

Savings Since Baseline Year

HARBEC, Inc.	49%
Cummins, Inc.*	45%
Ford Motor Corporation	44%
United Technologies Company (UTC)*	43%
Shari's Cafe & Pies	30%
Poudre School District, CO*	29%
Atlanta, GA*	20%
State of North Carolina	19%
Hillsboro, OR	15%

*Water goal achiever

Water / Wastewater Treatment Partners

- ▶ Bath Electric, Gas and Water Systems, NY
- ▶ Bucks County Water & Sewer Authority, PA
- ▶ Encina Wastewater Authority, CA
- ▶ Ithaca Area Wastewater Treatment Facility, NY
- ▶ Los Angeles Department of Water and Power, CA
- ▶ Orange Water and Sewer Authority, NC
- ▶ Victor Valley Wastewater Reclamation Authority, CA

Water Solutions That Work

- ▶ **Emory University's** Water Hub project reclaims 400,000 gallons of campus wastewater daily for use in chiller plants, steam plants, and toilets, cutting potable water consumption by 35%.
- ▶ **Shari's Cafe and Pies** remodeled its Roseburg, OR restaurant as part of the company's sustainability program with low-flow aerators, heated dipperwells, and low-flow pre-rinse sprayers.
- ▶ **City of Atlanta**, through its local Atlanta Better Buildings Challenge Program, performed a building assessment and issued water conservation recommendations for the Technology Square Research Building, resulting in enhanced water metering, real-time monitoring of water use via dashboard and installation of a condensate recovery system for water reuse that cut annual water usage by 9%.
- ▶ **District of Columbia** upgraded the historic GSA-owned Hotel Monaco with energy and water measures, including repairing the restaurant chiller, replacing guest room showerheads, and refurbishing the cooling tower, which reduced annual water consumption by 41%.
- ▶ **The Tower Companies** has incorporated "green" clauses into new and renewed leases to encourage tenants to benchmark and save energy and water.
- ▶ **TIAA's** City Center showcase project achieved a 36% reduction in water usage through no-and low-cost measures to improve the efficiency of plumbing fixtures and reduce the frequency of sidewalk cleanings.
- ▶ **UTC** provided its employees the tools and resources that resulted in a 43% absolute reduction in global water use. Its internal water guidance document details the company's global water scarcity assessment, best practices in managing water at individual sites, and water saving case studies.

Sector Spotlights

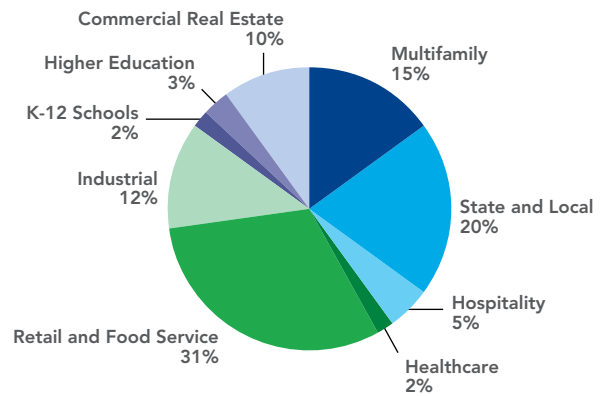
In the past year, the Better Buildings Challenge welcomed more than 60 new partners. The multifamily sector was the largest contributor of this growth with 18 new partners, and the partner with the biggest commitment in the past year was the New York City Housing Authority, which at 175 million square feet is the largest public housing authority in the U.S. The cumulative commitments of data center partners also jumped significantly, increasing from 59 megawatts across 16 data centers in 2014 to over 500 megawatts across 99 data centers. The table on this page demonstrates the remarkable diversity in partner organization and portfolio size by market sector, while the pie chart shows the distribution of partners by market sector. The map illustrates the geographic distribution of facilities shared by program partners to date. Over 34,000 properties were shared with the program as of 2015.

The market spotlights found on the following pages provide a deeper look into the sector-specific trends and other issues influencing decisions about investing in greater energy efficiency. They also feature partners leading the way through innovative approaches that result in demonstrated energy savings and are shaping industry-wide practices. New to this year's report are spotlights for the data center and residential sectors.

Range of Portfolio Commitment by Market Sector

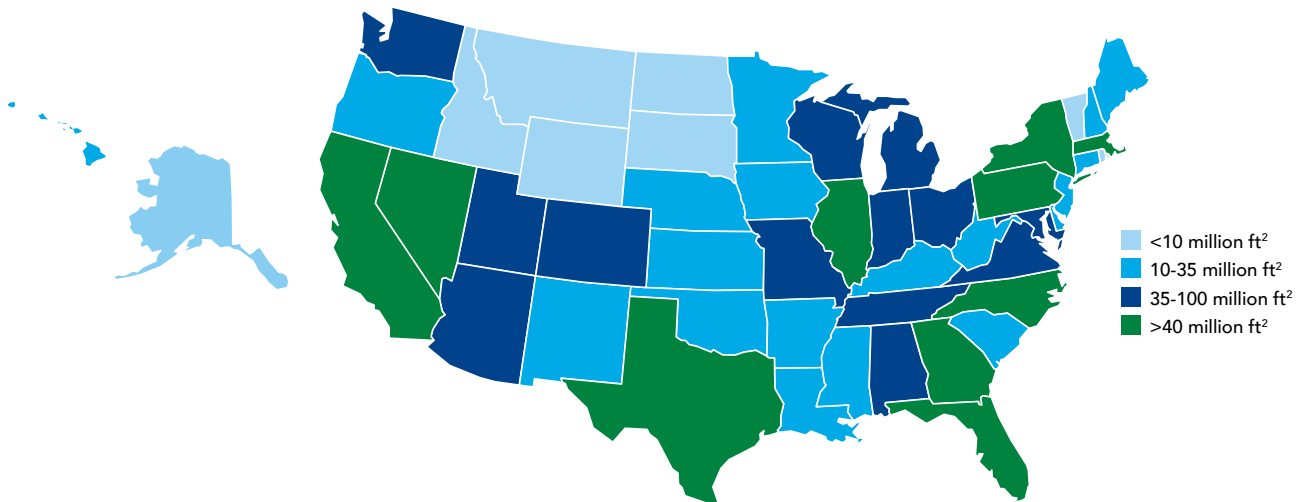
Smallest	Sector	Largest
430,000 sq. ft.	Commercial Real Estate	78 million sq. ft.
4 megawatts	Data Centers	250 megawatts
2.5 million sq. ft.	Healthcare	35 million sq. ft.
300,000 sq. ft.	Higher Education	28 million sq. ft.
245,000 sq. ft.	Hospitality	91 million sq. ft.
1 facility	Industrial	280 facilities
700,000 sq. ft.	K-12 Schools	24 million sq. ft.
18,000 sq. ft.	Multifamily	175 million sq. ft.
400,000 sq. ft.	Retail and Food Service	745 million sq. ft.
120,000 sq. ft.	State and Local	205 million sq. ft.

Better Buildings Challenge: Partners Across Market Sectors



Participation Across the Nation

Partners share progress for over 34,000 properties



SPOTLIGHT: Commercial Sector

The U.S. commercial building sector provides a substantial opportunity for energy savings. Leaders in this sector are accessing more information about their buildings through energy management systems and leveraging that information to enhance building operations and maintenance practices. They are installing new technologies that improve the indoor quality of the built environment and increase the comfort of workers and customers. They are also incorporating broader energy management initiatives in commercial building organizations, including engaging with franchisees and instituting green lease agreements, resulting in energy and cost savings.

47 PARTNERS INCLUDE:

- 19 Commercial Real Estate
- 6 Healthcare
- 7 Hospitality
- 15 Retail and Food Service

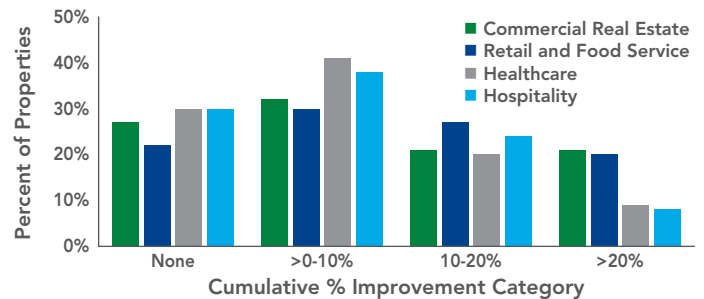
Partners with Greatest Energy Savings

Savings Since Baseline Year

Sprint*	38%
Best Buy*	31%
Arby's*	24%
Havertys*	22%
The Hartford Financial Services Group*	21%

*Goal achiever

Property Level Percent Improvements for the Commercial Sector



Most Viewed Sector Solutions:

SHOWCASE PROJECTS

- ▶ **Deutsche Asset & Wealth Management:**
Mixed-use Office and Retail Building, Washington, DC
- ▶ **Hilton:**
Hilton Columbus Downtown Hotel, Columbus, OH
- ▶ **Sprint:**
General Business-use Office Building, Irving, TX
- ▶ **Walgreens:**
Net Zero Energy Retail Store, Evanston, IL

IMPLEMENTATION MODELS

- ▶ **Kohl's Department Stores:**
Energy Finance Strategy
- ▶ **Prologis:**
Accessing Tenant Utility Data in Triple Net Leased Buildings
- ▶ **The Tower Companies:** Leveraging Green Leases to Reduce Energy and Water Use
- ▶ **USAA:**
Building Upgrade Value Calculator

Leadership in Action:

- ▶ **Hilton Worldwide** achieved certification in the Department of Energy's Superior Energy Performance (SEP) program at three of its hotels, becoming the first commercial sector company to earn the certification. Hilton hotels earning SEP have improved their energy performance between 6-16% over three years.
- ▶ **TIAA** contributed three new solutions to the Better Buildings Solution Center, bringing its total to five and making it the most prolific sharer of energy efficiency strategies and success stories in the program to date.
- ▶ **Shari's Cafe & Pies** became the first full-service restaurant to commit to the Better Buildings Challenge. The company plans to reduce energy intensity by 20% by 2025, and water by 35%, in its portfolio of nearly 100 restaurants.
- ▶ **The Wendy's Company** is empowering its franchisees to save energy through operational measures, new technologies, and project planning. The company's "Energy Times" magazine and educational sessions provided at the Wendy's annual convention are used to provide guidance to franchisees and share progress with corporate-owned restaurants.

SPOTLIGHT: Industrial Sector

The U.S. industrial sector spends more than \$200 billion on energy annually.² A significant portion of those costs could be avoided through improvements in energy efficiency, and those savings avoided through improvements in energy efficiency. Those savings can be redirected towards capital investments that help businesses grow and stay competitive. To capture these savings, leading organizations are developing energy management systems, pursuing creative financing models, sharing best practices, and installing new, more efficient technologies. Low-cost operational improvements and capital investments alongside advanced data analytics, automation systems, and combined heat and power projects, are driving major energy efficiency improvements at partner facilities.

33 PARTNERS INCLUDE:

- | | |
|--|--|
| 3 Chemicals | 1 Primary Metals |
| 5 Electrical Equipment | 1 Textiles and Apparel |
| 3 Food | 6 Transportation Equipment |
| 4 Machinery | 7 Utilities: Water, Sewage, and Other Systems |
| 2 Non-metallic Mineral Products | |
| 1 Plastics and Rubber | |

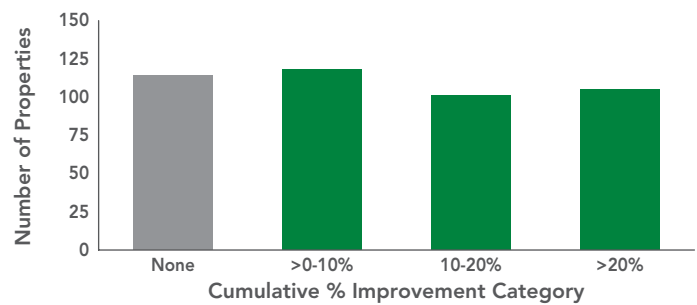
Partners with Greatest Energy Savings

Savings Since Baseline Year

Cummins, Inc.*	46%
HARBEC, Inc.*	31%
Nissan North America*	30%
Victor Valley Wastewater Reclamation Authority*	27%
Schneider Electric	24%

*Goal achiever

Property Level Percent Improvements for the Industrial Sector



Most Viewed Sector Solutions:

SHOWCASE PROJECTS

- ▶ **Cummins, Inc.:**
Jamestown Engine Plant, Lakewood, NY
- ▶ **General Mills:**
Cedar Rapids Heat Recovery, IA
- ▶ **J.R. Simplot:**
New Potato Processing Plant, Caldwell, ID
- ▶ **Nissan North America:**
New Paint Plant, Smyrna, TN

IMPLEMENTATION MODELS

- ▶ **3M:**
Capital Set Aside Fund
- ▶ **GE:**
Operations Management Leadership Program
- ▶ **General Motors:**
Energy Performance Contracting
- ▶ **Legrand North America:**
Submetering Initiative and Energy Dashboards

Leadership in Action:

- ▶ Partners achieved significant electricity savings through major HVAC upgrades. **Toyota** installed variable frequency drives on over 200 motors that power its HVAC system in Georgetown, Kentucky, shaving a third of the electricity needed to heat and cool the plant. **GE** upgraded 100 rooftop HVAC units at its Greenville, South Carolina, plant with modern enthalpy controls, cutting the plant's electricity bill by 10%.
- ▶ Companies are developing processes that allow them to assess investments in energy efficiency. **Alcoa** implemented a checklist to ensure energy efficiency is considered in capital investments over \$2 million. **Volvo** issued guidelines that allow managers to consider the risk of future energy prices when it evaluates energy efficiency investments.
- ▶ Seven water and wastewater treatment agencies are developing energy management systems aligned with the ISO 50001 Energy Management Standard as they seek certification in DOE's SEP program. This cohort, which includes four Better Buildings, Better Plants partners, is receiving specialized training in energy management and measurement and verification of energy savings.

SPOTLIGHT: State and Local Sector

Energy consumption in state and local government buildings totals over 1,300 trillion Btus annually.³ Local government buildings account for 64% of all government floor space⁴ and have a savings potential of 260 trillion Btus; state buildings could reduce energy use by up to 100 trillion Btus.⁵ Through policies, regulations, and programs—such as building performance policies and energy efficiency portfolio standards—state and local government partners are leading by example. Their efforts are saving taxpayer dollars, freeing up funding for other public priorities, and driving energy efficiency across their communities.

51 PARTNERS INCLUDE:

- 34 Cities
- 10 Counties
- 7 States

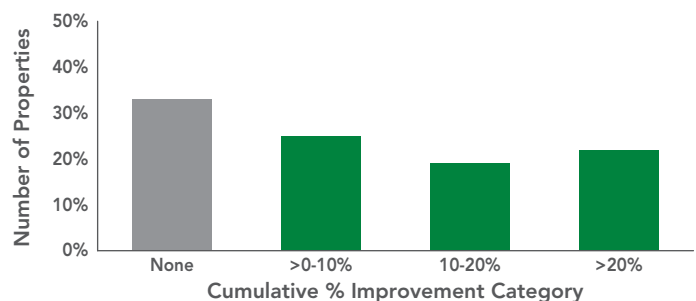
Partners with Greatest Energy Savings

Savings Since Baseline Year

State of Delaware*	23%
State of Maryland*	23%
Beaverton, OR*	22%
Hillsboro, OR*	21%
West Palm Beach, FL*	20%

*Goal achiever

Property Level Percent Improvements for the State and Local Sector



Most Viewed Sector Solutions:

SHOWCASE PROJECTS

- ▶ **Denver, CO:**
Richard T. Castro Building (Office and Public Service)
- ▶ **Philadelphia, PA:**
Public Safety Services Campus and Central Utility Plant
- ▶ **Placer County, CA:**
Granlibakken Conference Center & Resort

IMPLEMENTATION MODELS

- ▶ **Commonwealth of Massachusetts:**
Clean Energy Investment Program
- ▶ **Milwaukee, WI:**
Property Assessed Clean Energy (PACE) Program
- ▶ **State of Delaware:**
Centralized Benchmarking & Project Prioritization
- ▶ **State of Maryland:**
16-Agency Energy Competition
- ▶ **State of Minnesota:**
Guaranteed Energy Savings Program

Leadership in Action:

- ▶ The **State of New York** created BuildSmart NY, a state-led initiative to centralize state building energy management, set a blueprint for action, and provide project technical assistance and support.
- ▶ **Chattanooga, TN** is engaging local businesses, schools, and industry to join in its Challenge commitment. In partnership with the Electric Power Board, Tennessee Valley Authority, Chamber of Commerce, and others, the city aims to provide vital resources and guidance to its partners, and recently welcomed its first partner, the University of Tennessee at Chattanooga.
- ▶ **Philadelphia, PA** launched a pilot program that rewards city departments for their contribution toward city-wide energy reduction goals by allowing departments to keep a portion of their energy cost savings rather than returning the savings to the city's general fund. In the first year of the pilot program, departments collectively saved more than \$115,000.
- ▶ **San Diego, CA** deployed an LED street light project that includes lighting control technology that provides real-time data monitoring. The city collaborated with the local utility to establish a tariff to reward efficiency measures. The city expects the project to achieve 72% energy savings and result in \$250,000 in annual cost savings.

SPOTLIGHT: Education Sector

The education sector continues to prioritize energy efficiency as a means to address rising energy costs and the demand for improved school performance. With over \$77 billion per year in combined operations and maintenance costs,⁶ the K-12 and higher education sectors have the opportunity to serve as good stewards and deliver value to tax and tuition payers. Education partners are implementing creative approaches in a number of key areas, including: onsite renewable generation; ongoing building commissioning; occupant engagement; workforce training and retention; revolving funds and the reinvestment of energy savings to support educational needs.

38 PARTNERS INCLUDE:

- 20 K-12 Schools
- 3 Community Colleges
- 2 Private Research Universities
- 3 Private, Liberal Arts Colleges
- 10 Public Research Universities

Most Viewed Sector Solutions:

SHOWCASE PROJECTS

- ▶ **Michigan State University:**
Anthony Hall, East Lansing, MI
- ▶ **Michigan State University:**
Erickson Hall, East Lansing, MI
- ▶ **Poudre School District, CO:**
Poudre High School Infrastructure Replacement, Fort Collins, CO
- ▶ **Towson University:**
Athletic Fieldhouse, Towson, MD

IMPLEMENTATION MODELS

- ▶ **Allegheny College:**
Campus Energy Efficiency Challenges
- ▶ **Delaware State University:**
On-Balance Sheet, Off-Debt Capacity Performance Contracting
- ▶ **Michigan State University:**
Integrated Model For Long Term Campus Energy Planning
- ▶ **University of California, Irvine:**
Empowering Managers to Help Teams Meet Big Goals

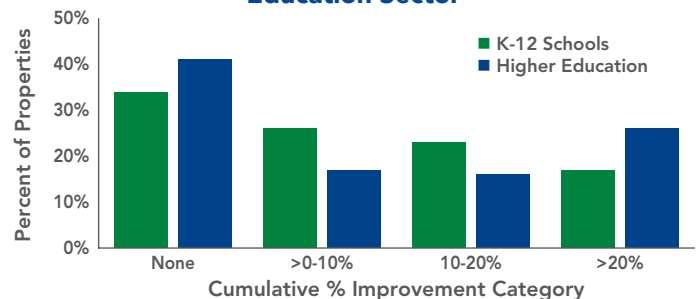
Partners with Greatest Energy Savings

Savings Since Baseline Year

Camas School District, WA*	32%
University of California, Irvine*	28%
Poudre School District, CO*	25%
River Trails School District 26*	23%
Chesapeake College	19%

*Goal achiever

Property Level Percent Improvements for the Education Sector



Leadership in Action:

- ▶ **Douglas County School District** implemented a \$5.1 million energy savings performance contract to make critical facility improvements, and its success enabled the district to leverage an additional \$5.6 million in bonds and grants to double the project to \$10.7 million.
- ▶ **Camas School District, WA** developed the Resource Conservation Management Program, a long-term strategy to reduce district electricity, natural gas, indoor and outdoor water, and waste 20% by 2020. The policy also established buy-in and accountability of all district members. In 2015, five years ahead of schedule, the district achieved an energy reduction of 28%.
- ▶ **University of California, Irvine** was ranked the most sustainable college campus for the second year in a row in Sierra magazine's 2015 "Cool Schools" ranking. UCI quadrupled its use of solar power and diverted 80% of waste from landfills last year. UCI first topped the Sierra rankings in 2014 when it achieved its Better Buildings Challenge goal by reaching 23% energy savings in five years.
- ▶ **University of Hawaii, Manoa** is completing two 1,500 square foot, zero net energy classroom buildings featuring rooftop solar PV, high efficiency LED lighting with daylight sensors, operable windows with high-performance glazing, and ceiling fans to maximize natural ventilation. A state-of-the-art split air conditioning system will ensure occupant comfort.

SPOTLIGHT: Data Centers

Data centers consume more than 2%⁷ of all U.S. electrical use annually, with infrastructure loads comprising 50%⁸ of data center energy consumption. Their intensive 24-hour schedules offer many opportunities for projects with short payback periods and high returns on investment, and it's estimated that energy reductions of 20-40%⁹ are possible by applying simple best practice measures. Leaders in this sector are capturing savings by installing metering to separate out IT and infrastructure energy usage; leveraging information from Data Center Infrastructure Management Systems (DCIM) for intelligent capacity planning; and making capital investments to improve resiliency as well as save energy.

12 PARTNERS INCLUDE:

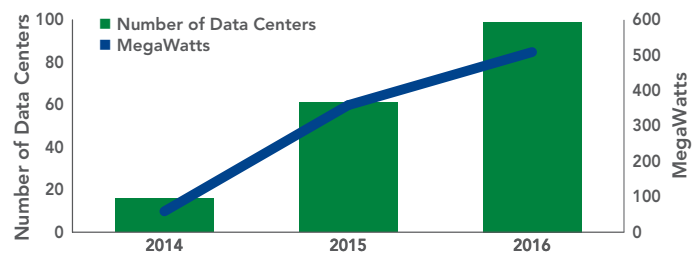
- 6 General Data Center Organizations
- 4 Manufacturing, R+D, and Software Services
- 1 Higher Education Organization
- 1 Retailer

Partners with Greatest Energy Savings in 2015

eBay, Inc.*	25%
Intuit*	21%
Digital Realty Trust, Inc.	17%

*Goal achiever

Data Center Commitments Over Time



Key Sector Trends:

- ▶ **KEY PERFORMANCE INDICATORS:** Companies have made huge strides in the measurement and management of their data center energy consumption. They are using a variety of metrics including the Green Grid's Power Usage Effectiveness (PUE), Water Usage Effectiveness (WUE), Carbon Usage Effectiveness (CUE), and the Energy Reuse Effectiveness (ERE) in their new build and purchasing decisions.
- ▶ **DATA CENTER INFRASTRUCTURE MANAGEMENT SYSTEMS (DCIM):** DCIM software systems are being used to enhance data center operations by ensuring systems are working together efficiently, and by actively collecting performance metrics to help make informed decisions on energy usage.
- ▶ **OPERATIONAL UPTIME:** Various processes are being employed to quantify and prevent the risk of failure and downtime of critical infrastructure and computing systems. Traditional approaches, such as building redundancy into systems, are being complemented with predictive maintenance programs that forecast potential failures before they occur and probabilistic risk assessments that help operators make informed decisions on infrastructure improvements.

Leadership in Action:

- ▶ **Digital Realty** worked with primary customers in their Lithia Springs data center to employ a combination of infrastructure retrofit projects and best energy practices. These improvements helped the facility earn the ENERGY STAR® building certification, identifying it as a national leader in operational energy performance.
- ▶ **eBay** performed motor and variable speed drive retrofits on 83 chilled water computer room air handlers in their Tier IV data center in Phoenix, AZ, which resulted in a Power Usage Effectiveness (PUE) of 1.59 and reduced the total building electrical load by 7%. They project a 2.5 year payback on the project from an initial cost of \$750,000.
- ▶ The **National Renewable Energy Laboratory** constructed the Energy System Integration Facility (ESIF) Data Center. The LEED® Platinum certified data center was designed to achieve an annualized PUE of 1.06, which represents best-in-class performance when compared to an average data center PUE of 1.7. This building showcases an innovative, holistic data center design that relies solely on evaporative cooling, direct component level liquid cooling, and complete capture of waste heat used to heat offices and lab space on campus, along with many other approaches that are widely applicable to data center operations.

SPOTLIGHT: Financial Allies

Access to capital is one of the top barriers to energy efficiency retrofits, but it also represents a large opportunity to leverage third-party financing to increase deployment of efficiency. The Department of Energy created the Financial Ally program within the Better Buildings Challenge to recognize and support leading financing companies that are improving access to capital across the economy. The past year has seen exciting financial innovation in the form of new companies, partnerships, products, and services, much of which was led by the Financial Allies.

29 FINANCIAL ALLIES INCLUDE:

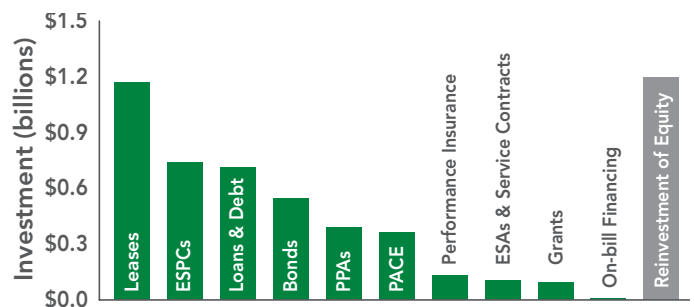
- 23 Financial Allies
- 6 Multifamily Financial Allies

Financial Allies with Most Capital Invested in 2015

Bank of America Merrill Lynch	\$630M
Enterprise Community Partners*	\$553M
Citi*	\$538M
Ygrene Energy Fund*	\$191M
AFL-CIO*	\$151M

*Goal achiever

Cumulative Investment by Financial Product (2012 - 2015)



Key Sector Trends:

- ▶ **OLD AND NEW FINANCING PRODUCTS:** Financing companies continue to offer tried-and-true products such as leases, loans, and ESPCs, and those deals still represent the bulk of the market. At the same time, 2015 saw the continued development and deployment of innovative new products including energy savings agreements (ESAs), PACE, on-bill financing, green bonds, and metered energy efficiency transaction structures (MEETS).
- ▶ **THE RISE OF GREEN BANKS:** Though the concept has existed for years, green banks and other energy investment partnerships took center stage in 2015. The growing number of these programs, the emergence of early success stories, and the launch of the global Green Bank Network indicate that green banks are taking on a leading role in market transformation.
- ▶ **CUSTOMER-CENTRIC PROGRAM DESIGN:** Following in the footsteps of the solar energy market, efficiency financing companies are increasingly realizing that the customer experience is key to driving demand. Leaders are making increased efforts to develop software, vendor partnerships, and quick turnaround times that make financing feel seamless.

Leadership in Action:

- ▶ The Investor Confidence Project launched its new Investor Network, which includes **Clean Fund, Energi, Metrus Energy, Renew Financial,** and **SparkFund** as founding members. The network connects investors with efficiency project developers, offering a common language to compare project risks and savings.
- ▶ Many of the Financial Allies are working with DOE and other industry leaders to develop the **Better Buildings Energy Efficiency Financing Navigator**, an online tool that will let building owners easily compare options for financing their efficiency projects. The Navigator is set for launch in 2016.
- ▶ A group of green banks and non-profits, including the **Connecticut Green Bank**, launched the global Green Bank Network at the Paris climate conference in December 2015.
- ▶ **Metrus Energy** expanded its implementation model for a multi-site ESA financing program with BAE Systems, investing a total of \$10 million across five projects in three states.
- ▶ **Citi** completed \$538 million in warehouse credit lines and secondary market transactions, including the first-ever asset-backed securitization of a portfolio of energy efficiency-only loans in partnership with **Renew Financial**.

SPOTLIGHT: Multifamily Sector

Multifamily properties in the U.S. spend \$21 billion on energy annually.¹⁰ Partners in this sector face unique challenges, including the need to balance the roles of owners and residents in the improvement and operations of buildings, as well as the rules of private and public finance and regulatory organizations. Nonetheless, partners in this sector are making great strides to improve the energy efficiency of the nation's multifamily building stock—as well as its water efficiency, healthfulness, and durability—by skillfully utilizing the complex system of programs and policies that support the housing sector.

108 PARTNERS INCLUDE:

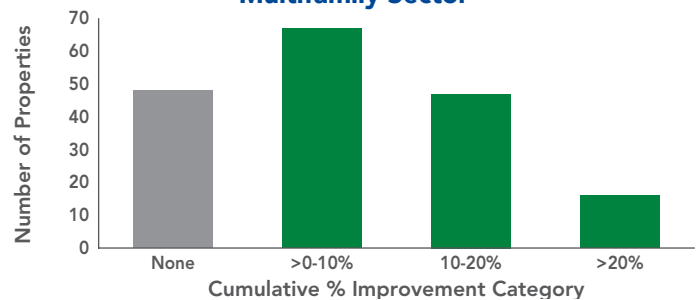
- 39 Public Housing Authorities
- 50 Assisted Housing Providers
- 10 Market-Rate Providers
- 9 Mixed (Assisted + Market-Rate) Providers

Partners with Greatest Energy Savings

Savings Since Baseline Year

Jewish Community Housing for the Elderly	17%
Trinity Housing Corporation of Greeley, CO	15%
The Economic Development Authority of the City of Mankato, MN	13%
The Housing Authority of the City and County of Denver	10%
Atlanta Housing Authority	8%

Property Level Percent Improvements for the Multifamily Sector



Most Viewed Sector Solutions:

SHOWCASE PROJECTS

- ▶ **Community Housing Partners:**
Warwick SRO, Newport News, VA
- ▶ **LINC Housing Corporation/SEED Partners:**
City Gardens Apartments, Santa Ana, CA
- ▶ **Rockford Housing Authority:**
Park Terrace Apartments, Rockford, IL
- ▶ **Trinity Management:**
Glenark Mills & Glenark Oaks, Woonsocket, RI

IMPLEMENTATION MODELS

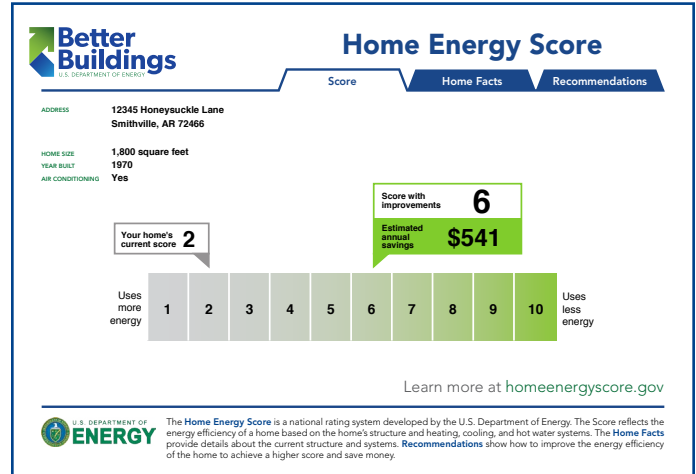
- ▶ **REACH CDC:**
Passive House for Affordable Housing
- ▶ **Jersey City Housing Authority:**
Getting the Most out of Energy Performance Contracts
- ▶ **Rockford Housing Authority:**
Use of Energy Performance Contract Allows Continuous Provision of Quality Affordable Housing

Leadership in Action:

- ▶ **Stewards of Affordable Housing for the Future** members **Mercy Housing, The Community Builders, National Housing Trust, National Church Residences,** and **Preservation of Affordable Housing,** have developed building performance tools to help partners achieve their goals, such as the EZ Retrofit Tool and an O&M Toolkit.
- ▶ **REACH CDC** successfully integrated Passive House standards into multifamily affordable housing. REACH describes this process in its recently published implementation model on the Better Buildings Solution Center.
- ▶ **EAH Housing** is developing alternative methods to track and estimate residential renewable energy system production and consumption values for properties with net metered, virtual net metered, and surplus energy producing systems.
- ▶ **Community Housing Partners** is researching ways to use smart phone Wi-Fi-based data collection technology to allow tracking and recording of real-time energy usage across its portfolio.

SPOTLIGHT: Residential Sector

Residential energy use accounts for over 20% of total energy consumption in the United States.¹¹ Home energy upgrades offer a wide range of benefits including improved health and comfort, lower utility costs, and often increased home value. Yet most homeowners ignore opportunities for cost effective energy improvements. The Residential Accelerator partners are tackling some of the barriers that continue to hinder efficiency investments. They are implementing innovative strategies to minimize costs associated with managing and operating home energy upgrade programs while improving overall program effectiveness. Partners are also expanding the availability of information regarding homes' expected energy use and efficiency during home sale transactions.



35 ACCELERATOR PARTNERS INCLUDE:

- 5 Multiple Listing Service Operators
- 8 Program Administrators
- 5 Real Estate Aggregators
- 5 Standards Organizations
- 3 State and Regional Organizations
- 9 Trade Organizations

Key Sector Trends:

- ▶ **VOLUNTARY REAL ESTATE INTEGRATION:** Energy efficiency and real estate industry stakeholders are committing to voluntary mechanisms to promote homeowner investments in energy efficiency to the real estate market.
- ▶ **A COMMON DATA LANGUAGE AND TRANSFER PROTOCOL:** Partners are adopting a common data standard, thereby creating greater interoperability and increased opportunities for partners, vendors, and innovators to collaborate.
- ▶ **IMPROVING PROGRAM WORK FLOW:** Home energy upgrade programs are exploring process improvements to minimize program costs while expanding program impact.
- ▶ **NEW EFFICIENCY MORTGAGE PRODUCTS:** In 2016, the Federal Housing Administration and Fannie Mae both launched new mortgage policies and products to encourage greater investment in energy improvements at time of purchase or refinance. Partners are reaching out to lenders to make sure homeowners and buyers take advantage of these attractive financing options.

Leadership in Action:

- ▶ The **Colorado Energy Office** has taken steps to use efficiency data more effectively and grow the amount of information available. They launched Home Energy Score statewide, started offering consumers a \$750 bonus for every one point improvement on their score, and reaching more consumers by engaging home inspectors to offer the score.
- ▶ The **Northeast Energy Efficiency Partnership** launched a collaborative effort with the **Vermont Energy Investment Corporation**, the **National Association of State Energy Officials**, and other organizations to create a publicly accessible database of energy ratings and other relevant energy information. The Home Energy Labeling Information Exchange (HELIX) is a data repository that will serve a variety of stakeholders including real estate professionals, appraisers, lenders, and consumers across a multi-state region by providing reliable energy information during the real estate transaction.
- ▶ The **New York State Energy Research and Development Authority** and **Build It Green** are streamlining program data processing by adopting HPXML, a national residential energy efficiency data standard. This improvement decreases transaction costs associated with collecting and transferring energy efficiency data between contractors and the program and gives contractors a choice in selecting a qualified energy modeling software.
- ▶ **NeighborWorks of Western Vermont HEAT Squad** worked with Efficiency Vermont to integrate software across their two residential energy efficiency programs. This improvement has reduced HEAT Squad's processing time for submitting completed energy assessments from 40 to 5 minutes and has allowed them to reallocate resources elsewhere in the program.

Getting the Word Out

Annual Better Buildings Summit

The annual Better Buildings Summit invites market leaders and key stakeholders to share their insights into the innovative leadership, collaborative partnerships, and demonstrated best practices that accelerate energy savings. The 2016 Summit marks the third annual gathering of visionaries in the public and private sectors.

The Better Buildings Summit builds on success from previous partner meetings, at which 900 participants from leading organizations showcase their solutions for our nation's homes, commercial buildings, and industrial facilities. It is the venue for partners to receive high-level DOE and White House recognition for taking on the Initiative's energy efficiency goals and continuing to demonstrate their leadership.

Summit Highlights:

- ▶ Partner Led Sessions: Comprehensive sessions for public and private stakeholders featuring partner speakers and supported by technical experts
- ▶ Partner-to-partner Networking: Access to DOE technology and market solutions experts, showcase project building tours, and sector peer networking opportunities
- ▶ Partner Recognition: Goal achievers are applauded for stepping up to the Challenge, achieving portfolio-wide energy and water efficiency goals, and serving as agents of change

Better Buildings Solution Center

The Better Buildings Solution Center is now loaded with 400 proven and replicable strategies for overcoming barriers to efficiency and achieving deep savings, in individual properties and across broad portfolios. These partner-created solutions include tangible case studies, implementation models, and showcase projects, as well as adaptable calculators, presentation templates, and procurement guidance.

Find Energy Solutions

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PARTNER --Choose--	SECTOR --Choose--	CONTENT TYPE --Choose--	TECHNOLOGY --Choose--

Better Buildings Challenge SWAP: Season 1

Leaders can always do more. This year, in partnership with **Hilton Worldwide** and **Whole Foods Market**, DOE launched the Better Buildings Challenge SWAP as a way to further recognize partners for their leadership. This unique way to spur inter-industry collaboration provides a platform for partners to learn from one another in new and engaging ways.

Can a Reality TV Show Help Cut America's Power Bill?

Bloomberg — 2/17/2016

Watch the Department of Energy's Earnest, Kind Of Adorable Energy-Efficiency Reality Show

FASTCOMPANY — 2/26/2016

How many companies does it take to change a lightbulb?

theguardian — 2/17/2016



OVER **430,000** VIDEO VIEWS



OVER **11 Million** IMPRESSIONS OF #SWAPPED16



17 Million UNIQUE MEDIA HITS



SEASON 1 NOW PLAYING



Better Buildings Accelerators

Update on Completed and On-Going Accelerators

Better Buildings Accelerators are targeted, short-term, partner-focused activities designed to address persistent barriers that stand in the way of greater efficiency. They have clearly defined objectives, bringing together a collection of key stakeholders who commit themselves to affect change and make substantive progress overcoming key barriers within specific time-frames. Since 2013, 10 Accelerators have been launched, and over 130 organizations have collaborated to overcome common challenges. Already one Accelerator has successfully accomplished objectives and ended activities, and two more Accelerators are expected to successfully complete activities in 2016. See below for details and highlights from the past year.

Energy Data Accelerator: The Better Buildings Energy Data Accelerator (BBEDA) was a two-year partnership with cities and utilities to improve energy efficiency by expanding energy data accessibility. As a result of best practices developed by BBEDA partners, 18 utilities serving more than 2.6 million commercial customers nationwide will provide whole-building energy data access to building owners by 2017. This historic expansion of data access will increase building energy benchmarking, the first step many building owners take to improve energy efficiency. Accelerator partners identified and implemented best practices that will help utilities overcome traditional barriers to data access solutions. The best practices are:

- ▶ **Mapping Meters to Buildings:** Utilities link energy meters and customer accounts to physical buildings in their information systems. This enables building owners to receive whole-building energy data for benchmarking and provides utilities with new market intelligence that can improve their delivery of energy efficiency programs.
- ▶ **Simplify Tenant Authorizations:** Utilities provide building owners with energy usage data that is aggregated at the building level. This helps protect the confidentiality of individual tenants and diminishes the need for tenant authorizations, while also reducing program costs to the utility.
- ▶ **Streamline Data Transfer:** Utilities automate the transfer of whole-building data directly into benchmarking tools, such as EPA's ENERGY STAR® Portfolio Manager®, reducing transaction costs for both utilities and building owners.

These best practices are explained in more detail in the Energy Data Accelerator Toolkit, a collection of resources featured in the Better Buildings Solution Center that will enable other utilities and communities to learn and benefit from the work of the BBEDA.

Results to date:

- ▶ Eighteen utilities serving 2.6 million commercial customers will provide whole-building energy data solutions by 2017.
- ▶ Six organizations pledged to continue to work with their partners and stakeholders to promote data access: ACEEE; IMT; National Multifamily Housing Council; NRDC; U.S. EPA; and USGBC.
- ▶ The BBEDA Toolkit provides resources and best practices to enable the replication of solutions nationwide.

The following city and utility partners have developed data access solutions for their customers that will be implemented by 2017:

- | | | |
|---|--|---|
| ▶ Austin Energy/City of Austin, TX | ▶ Orlando Utilities Commission/City of Orlando, FL | ▶ Rocky Mountain Power/Salt Lake City, UT |
| ▶ Commonwealth Edison/City of Chicago, IL | ▶ Pacific Gas & Electric/City of San Francisco, CA | ▶ San Diego Gas & Electric/Cities of San Diego, CA, and Chula Vista, CA |
| ▶ Eversource/Cities of Boston, MA, and Cambridge, MA | ▶ PECO Energy Company/City of Philadelphia, PA | ▶ Southern California Edison/City of Santa Monica, CA |
| ▶ Kansas City Power and Light/City of Kansas City, MO | ▶ Pepco/District of Columbia | ▶ Southern California Gas/City of Los Angeles, CA |
| ▶ Los Angeles Department of Water and Power/City of Los Angeles, CA | ▶ Puget Sound Energy/ City of Seattle, WA | ▶ Xcel Energy/City of Minneapolis, MN |
| ▶ National Grid/City of New York, NY | ▶ Questar/Salt Lake City, UT | |

Energy Savings Performance Contracting (ESPC) Accelerator: Launched in 2013, 24 partners have committed to investing \$2 billion in ESPCs, and to sharing data on projects and results. In 2016, ESPC Accelerator partners have focused on optimizing measurement and verification for ESPC projects and sharing successful strategies for overcoming key process, framework, and market barriers to ESPC.

Results to date:

- ▶ \$1.5 billion invested, 82% of the \$1.8 billion committed through 2015.
- ▶ Updated model ESPC documents to streamline the project development process and cut transaction costs.
- ▶ Expanding the federal data tracking tool, eProject Builder, to provide a free tool for state and local governments to easily access, track, and report ESPC projects.
- ▶ Creating toolkits, decision aids, and building blocks for improving ESPC processes, building an infrastructure, and entering new markets.

Each ESPC partner has worked with the DOE to overcome a specific barrier hindering efforts to streamline the ESPC process, build an ESPC infrastructure, or stimulate projects in target markets. These efforts have resulted in the development of a number of solutions to assist other jurisdictions facing similar issues. For example, creating a decision tree to help select the best-suited ESPC data management tool; designing an approach to develop and leverage ESPC champions; and developing a toolkit to maintain the implementation of ESPC projects through leadership transitions. All solutions will be featured on the Better Buildings Solution Center.

Partners:

- | | | | | |
|---------------------------|----------------------------------|------------------------|--------------------------|----------------------------|
| ▶ City of Cincinnati, OH* | ▶ Philadelphia School District | ▶ State of Alabama* | ▶ State of Minnesota | ▶ State of New Mexico* |
| ▶ City of El Paso, TX* | ▶ Commonwealth of Massachusetts* | ▶ State of Colorado* | ▶ State of Missouri | ▶ State of North Carolina* |
| ▶ City of Fort Worth, TX* | ▶ Commonwealth of Virginia* | ▶ State of Connecticut | ▶ State of Montana* | ▶ State of South Carolina |
| ▶ City of Houston, TX* | | ▶ State of Hawaii* | ▶ State of Nevada | ▶ State of Washington* |
| ▶ City of Newark, NJ* | | ▶ State of Illinois | ▶ State of New Hampshire | ▶ U.S. Virgin Islands |
| | | ▶ State of Michigan * | | |

**2015 Progress Goal: 75% of commitment invested*

Data Center Accelerator: Twenty-three organizations are working with DOE to reduce the infrastructure energy intensity relative to their IT energy for one or more of their data centers by 25% over a five year period. Partners include federal agencies, national laboratories, higher education facilities, private businesses, and a state government. Over the past year, many of the accelerator partners have been installing the metering to gather the baseline energy and annual energy data that they will use to measure progress. Seven partners have already collected their initial energy data.

Results to date:

- ▶ The Data Center Metering and Resource Guide was created to provide an in-depth overview for partners who are still facing challenges in implementing infrastructure-focused metering.

Partners:

- | | | |
|---|--|---------------------------------------|
| ▶ Argonne National Laboratory | ▶ U.S. Department of Justice – Drug Enforcement Agency | ▶ Oak Ridge National Laboratory |
| ▶ Defense Health Agency | ▶ Lawrence Berkeley National Laboratory | ▶ U.S. Social Security Administration |
| ▶ U.S. Department of Defense - Defense Information Systems Agency | ▶ Lawrence Livermore National Laboratory | ▶ Stanford University |
| ▶ Environmental Molecular Sciences Laboratory | ▶ Los Alamos National Laboratory | ▶ U.S. Department of Veterans Affairs |
| ▶ U.S. Environmental Protection Agency | ▶ U.S. National Aeronautics and Space Administration | ▶ Virtustream |
| ▶ The Home Depot | ▶ National Energy Research Computing Center | ▶ State of Michigan |
| ▶ Indiana University | ▶ National Renewable Energy Laboratory | ▶ University of Colorado |
| | | ▶ University of Iowa |
| | | ▶ Waste Management Inc. |

Home Energy Information Accelerator: Launched in 2015, this Accelerator brings together 29 partners who are working to make home energy information, such as a home's efficiency certification or its estimated energy usage, readily available at relevant points in residential real estate transactions. National partners help to identify existing assets or work together to fill information gaps, while local partner groups in seven markets seek to demonstrate replicable approaches to make energy-related information easily available to home buyers and sellers through multiple listing services (MLS) and other reports.

Results to date:

- ▶ All seven Accelerator pilot locations (states of California, Colorado, Illinois, Oregon and Vermont; the District of Columbia; and multi-state region covered by the Northeast Energy Efficiency Partnership) finalized action plans, began implementation with technical assistance from national partners, and identified commonalities and opportunities for collaboration.
- ▶ The Real Estate Standards Organization accelerated the national target timeline for MLS to adopt standard fields for home energy information by two years from 2020 to 2018.

Partners:

- ▶ Appraisal Institute
- ▶ Build it Green
- ▶ Colorado Energy Office
- ▶ CoreLogic
- ▶ Council of Multiple Listing Services
- ▶ District of Columbia Sustainable Energy Utility
- ▶ Earth Advantage
- ▶ Elevate Energy
- ▶ Enhabit
- ▶ Green Button Alliance
- ▶ Homes.com
- ▶ Home Innovation Research Labs
- ▶ Home Performance Coalition
- ▶ Illinois Department of Commerce & Economic Opportunity
- ▶ Information and Real Estate Services, LLC
- ▶ Institute for Market Transformation
- ▶ Metropolitan Regional Information Systems
- ▶ Midwest Real Estate Data
- ▶ National Association of Realtors® CRTLabs
- ▶ National Association of State Energy Officials
- ▶ Northeast Energy Efficiency Partnerships
- ▶ Oregon Department of Energy
- ▶ PicketFence.com
- ▶ Real Estate Standards Organization
- ▶ Realtors Property Resource LLC
- ▶ Regional Multiple Listing Service
- ▶ U.S. Green Building Council
- ▶ Vermont Energy Investment Corporation

Home Upgrade Program Accelerator: Administrators of energy efficiency programs are working together, and with DOE, to bring more home energy upgrade services to homes across the country. Partners are working to improve and expand programs while minimizing program costs, with new approaches in information technology and adopting common data standards to streamline data exchange. In 2015, partners focused on putting in place processes supported by enhanced software infrastructure to reduce the costs of running energy upgrade programs. Future activities will focus on developing tools to help partners implement and measure the impact of process improvements.

Results to date:

- ▶ Five organizations identified processes and improvement strategies, committed resources, and implemented and tested process improvements in 2015.
- ▶ Arizona Public Service, NYSERDA, Enhabit, and Build It Green used a national residential energy efficiency data standard and other process design improvements to help streamline data processing, which decreased transactional costs associated with collecting and transferring energy efficiency data between contractors and the program administrators.

Partners:

- ▶ Arizona Public Service*
- ▶ Build It Green*
- ▶ Building Performance Institute
- ▶ Enhabit*
- ▶ Midwest Energy Efficiency Alliance
- ▶ NeighborWorks of Western Vermont HEAT Squad*
- ▶ New York State Energy Research and Development Authority*
- ▶ Pearl Home Certification

**2015 Progress Goal: Identify, fund, and implement process improvements*

Superior Energy Performance (SEP) Accelerator: This Accelerator is a two-prong effort that supports manufacturers, commercial business, utilities, and program administrators to develop and deploy strategic energy management systems in industrial and large energy-using commercial facilities and building complexes. Ratepayer-funded partners engage utilities and program administrators to include ISO 50001 and SEP in their program designs for industrial and commercial customers. Enterprise-wide partners work with DOE to create a deployment strategy for SEP on an enterprise-wide level, and to verify energy performance for all facilities seeking SEP certification.

Results to date:

- ▶ Worked with Ratepayer-Funded Partners to publish a toolkit for setting up a program that includes a generic program planning guide, program template, and a cost-effectiveness screening tool.
- ▶ Connected 38 industrial facilities in a common ISO 50001 energy management (enterprise) system.
- ▶ 3M, Cummins, and Schneider Electric have provided training at their facilities and achieved ISO 50001 certification for their SEP Accelerator enterprise.

Partners in action:

- ▶ Schneider Electric has implemented the Superior Energy Performance program with 16 SEP certified manufacturing facilities within their North American operations. In 2015, the SEP facilities have experienced an average of 60% greater energy savings than their facilities that haven't yet enrolled in the SEP Program.
- ▶ Efficiency Vermont has successfully identified a customer in their service territory to partner with in the SEP Ratepayer-funded Accelerator. Together, they will implement the DOE SEP program at the WestRock Missisquoi Mill in Vermont. Vermont Gas will also be a partner, ensuring a robust joint utility interaction. A dedicated energy manager, jointly supported by all three partners, is being hired to manage the SEP implementation at the facility.

Ratepayer-funded Pathway Partners:

- ▶ Bonneville Power Administration
- ▶ Eversource
- ▶ Efficiency Vermont
- ▶ Focus on Energy

Enterprise-wide Pathway Partners:

- ▶ 3M (6 plants)*
- ▶ Nissan North America (3 plants)
- ▶ Cummins, Inc. (4 plants)*
- ▶ Schneider Electric (20 plants)*
- ▶ General Dynamics (5 plants)

**2015 Progress Goal for Enterprise-wide Partners: Enterprise ISO 50001 system in place with multiple SEP plants certified as part of the ISO 50001 enterprise.*

Outdoor Lighting Accelerator: DOE is working with state and local governments and regional networks to exchange more than 1.5 million lighting fixtures by December 2016 as part of the President’s Outdoor Lighting Challenge. Sixteen cities, 6 regional networks (working with many cities) and 3 states are currently partnering with DOE to find solutions to financial, regulatory, and technical barriers, helping to accelerate these exchanges. With commitment and persistence, partners are finding ways to collaborate with utilities, public utility commissions, and their communities to improve system-wide replacement processes at the municipal level.

Results to date:

- ▶ Sixteen partners have performed a street lighting system analysis to determine the economic and technical feasibility of city-scale conversion projects.
- ▶ The Outdoor Lighting Decision Tree Tool was created to provide an interactive and visual representation of critical decisions and approaches.
- ▶ The Outdoor Lighting Challenges and Solutions Pathways report was published in 2016, providing a comprehensive summary on successful approaches to systemic retrofits across the nation.

Partner in action:

- ▶ Washington State Transportation Improvement Board launched Relight Washington in collaboration with Sound Energy and Avista Utilities to implement a 10-year street light conversion program for small cities. Small cities across the state will be able to reap the benefits of high quality light, energy cost savings, and greenhouse gas mitigation—over 60 projects have been started since June 2015 and more will be started in 2016. Progress can be followed on the TIB’s public Performance Management Dashboard.

Partners:

- ▶ Albany, NY
- ▶ Anchorage, AK
- ▶ California Street Lighting Association
- ▶ Chicago, IL *
- ▶ Collaborative
- ▶ Dearborn, MI*
- ▶ Deerfield Beach, FL
- ▶ Delaware Valley Regional Planning Commission*
- ▶ Detroit, MI*
- ▶ Flint, MI*
- ▶ Garfield Clean Energy
- ▶ Huntington Beach, CA*
- ▶ Little Rock, AR*
- ▶ Los Angeles, CA*
- ▶ Mid-America Regional Council representing Kansas City, MO metro area*
- ▶ Portland, ME*
- ▶ Racine, WI
- ▶ San Diego, CA*
- ▶ Southeast Michigan Regional Energy Office*
- ▶ Southern California Regional Energy Network
- ▶ St. Petersburg, FL*
- ▶ State of Rhode Island
- ▶ State of Tennessee*
- ▶ State of Washington*
- ▶ Takoma Park, MD
- ▶ West Palm Beach, FL*

New Accelerators

Three new Accelerators will begin work in 2016. These Accelerators were developed based on high priority issues organizations and governments across the nation are actively working on but are facing critical challenges related to energy consumption. The three Accelerators will work with diverse organizations to develop a new set of solutions and further work in resiliency approaches, wastewater infrastructure, and increasing clean energy options to low and moderate income communities.

Combined Heat and Power (CHP) for Resiliency Accelerator: This Accelerator will support and expand the consideration of CHP solutions by states, communities and utilities for their critical infrastructure needs. As a collaborative effort with states, communities, utilities, and other stakeholders the Accelerator will examine the perceptions of CHP among resiliency planners, identify gaps in current technologies or information relative to resilience needs, and support the development of plans for communities that capitalize on CHP's strengths as a reliable, high efficiency, lower emissions electricity and thermal energy source for critical infrastructure. Currently, there are 15 entities collaborating on this front.

Partners:

- ▶ Bath Electric Gas and Water
- ▶ City of Boston
- ▶ City of Pittsburgh
- ▶ Health Care Without Harm
- ▶ City of Hoboken
- ▶ Long Island Power Authority
- ▶ Maryland Department of Commerce
- ▶ Miami-Dade Water and Sewer Department
- ▶ Montgomery County, Maryland
- ▶ National Grid
- ▶ New York City
- ▶ New York State Energy Research and Development Authority
- ▶ Pennsylvania Public Utility Commission
- ▶ PSEG Long Island
- ▶ Thermal Energy Corporation

Clean Energy for Low Income Communities Accelerator: The focus of this collaboration is to lower energy bills in low income communities through expanded installation of energy efficiency and distributed renewables. The Accelerator will encourage the development of partnerships and replicable models and identify funding options that a state-level agency, local government, or utility program could use to provide energy efficiency and renewable energy access to communities that need them most. Both energy efficiency and distributed renewables are proven approaches to lowering energy bills while improving environmental outcomes; however, different market barriers have slowed adoption of each type of clean energy. By working to install energy efficiency measures and distributed renewables at the same time, programs and contractors can engage customers in new ways and potentially accelerate access and adoption of these technologies. Accelerator Partners are exploring different avenues to an integrated approach, which could better increase access and demand of energy efficiency and distributed renewables in low income communities.

Wastewater Infrastructure Accelerator: This Accelerator will work over three years with state, regional, and local agencies that are engaging with water resource recovery facilities in their jurisdiction to accelerate a pathway toward a sustainable infrastructure. The Accelerator aims to catalyze the adoption of innovative and best-practice approaches in data management, technologies, and financing. With the support of technical expertise and peer exchange, participating water resource recovery facilities will design infrastructure improvement plans that will seek to improve the energy efficiency of their facilities and operations by at least 30% and ideally integrate at least one resource recovery measure. Partner solutions will provide model plans and road-tested examples that other water resource recovery facilities can follow on their path to a sustainable wastewater infrastructure.

Developing a Skilled Clean Energy Workforce

A skilled and qualified workforce is key to making American buildings more energy efficient and American companies more competitive. These professionals are critical to achieving future building performance since they are largely responsible for the implementation of energy efficiency measures and ensuring that those savings are continued over time. DOE is working closely with the commercial buildings industry and other federal agencies to develop training tools, materials, and voluntary credentialing guidelines through the Better Buildings Workforce Guidelines. This program provides resources to equip the commercial building workforce with the knowledge and qualifications to improve energy performance.

Credentials for Energy Professionals

Industry practitioners and the National Institute of Building Sciences (NIBS) worked closely with DOE to develop guidance, including voluntary national guidelines to streamline and improve the credentials for energy professionals. NIBS established the Commercial Workforce Credentialing Council (CWCC) to develop guidelines to help shape and influence existing training programs. In the spring of 2015, DOE launched its Better Buildings Workforce Guidelines (BBWG), a national framework that helps professional organizations develop high-quality training and certification programs for their members. The Guidelines address consistency, quality and scalability in commercial energy efficiency workforce and training programs.

Last year, DOE announced that the Association of Energy Engineers' (AEE) Certified Energy Manager[®] was the first certification program to be recognized under the Better Buildings Workforce Guidelines program. AEE represents more than 17,000 energy professionals in 90 countries working in the fields of energy engineering, energy management, renewables, power generation, energy services, and sustainability. AEE has certified over 28,000 energy professionals since 1981, with over 15,000 currently holding the CEM certification. DOE is now working with several other organizations that are interested in achieving BBWG recognition for their respective certification programs.

In 2016, the American National Standards Institute (ANSI) approved four DOE and CWCC-developed job task analyses, the Building Commissioning Professional, Building Energy Auditor, Building Operations Professional and Energy Manager. The ANSI-accredited and DOE-recognized credentials provided by third-party training and certification programs will help employers and employees alike know these training programs are rigorous and are equipping the workforce with the necessary knowledge and qualifications to do the job.

DOE has also developed the Building Re-tuning Training program for buildings with and without building automation systems (BAS) to provide facility staff with the knowledge and skills to cost-effectively improve the efficiency of operations.

Training for the Federal Workforce

The Federal Energy Management Program (FEMP) provides training to foster and maintain a high-performance workforce to construct, operate, and maintain facilities in an energy-efficient, sustainable, and cost-effective manner. Topics include proven, cutting-edge technologies and business practices to help agencies meet their energy, water, and sustainability goals dictated by federal laws and requirements. FEMP is accredited by the International Association for Continuing Education and Training (IACET) and awards IACET continuing education units (CEUs) upon the successful completion of select courses. Last year, FEMP had over 11,000 registrants for accredited and non-accredited training courses (including the Energy Exchange); more than 6,000 participants received CEUs certificates.

FEMP now offers a Certificate Series that provides a sequence of related accredited courses that, when completed together, offer comprehensive instruction on timely topics. FEMP also hosts an annual Energy Exchange conference which includes training sessions in 10 tracks, covering cost-effective best practices and information about cutting-edge, energy-efficient technologies. The training sessions are led and moderated by subject matter experts with expertise in project and policy implementation. Continuing education units can be obtained after passing session-specific quizzes with a minimum score of 80%. The 2016 event is planned for August 9-11, 2016 in Providence, RI.

Better Buildings Challenge: Partners and Allies

COMMERCIAL PARTNERS

Anthem, Inc.

Arby's**

Ascension***

Best Buy***

CKE Restaurants Holdings, LLC*

Cleveland Clinic Foundation***

Columbia Association*

CommonWealth Partners*

Deutsche Asset & Wealth Management***

Forest City Realty Trust***

The Hartford Financial Services Group, Inc.*

Havertys***

HEI Hotels & Resorts***

Hilton Worldwide**

IHG (InterContinental Hotels Group)***

The JBG Companies**

Jamestown, LP*

Kohl's Department Stores***

Las Vegas Sands Corporation*

Lend Lease*

Macy's***

MGM Resorts International**

New York-Presbyterian Hospital**

Nike Inc.*

Parkway Properties***

Parmenter Realty Partners*

PNC Financial Services Group*

Prologis**

Saunders Hotel Group*

Shari's Cafe & Pies**

Shorenstein Properties, LLC***

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Starbucks Coffee Company**

Suncoast Credit Union*

TIAA***

The Tower Companies**

Transwestern**

University of Maryland Medical Center

University of Nebraska Medical Center

UPMC (University of Pittsburgh Medical Center)***

U.S. Space and Rocket Center

USAA Real Estate Company**

Walgreens Co.**

Walmart**

The Wendy's Company**

Whole Foods Market***

Wyndham Worldwide***

DATA CENTER PARTNERS

CenturyLink, Inc.*

Digital Realty Trust, Inc.*

eBay, Inc.**

Facebook

IO Data Centers

Intel

Intuit*

Iron Mountain Data Centers

Michigan State University

Sabey Data Center Properties*

Schneider Electric

Staples

EDUCATION PARTNERS

Alachua County Public Schools*

Albuquerque Public Schools, NM

Allegheny College***

Anne Arundel County Public Schools, MD*

Bard College

Camas School District, WA***

Chesapeake College**

Community College of Allegheny County

Delaware State University**

Douglas County School District, NV***

Dysart Unified School District 89, AZ**

Evergreen Public Schools, WA**

Florida A&M*

Fort Atkinson School District, WI*

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Manchester School District*

Mesa County Valley School District, CO

Michigan State University***

Northwestern University

Penn State University*

Portland Public School District, OR**

Poudre School District, CO***

River Trails School District 26, IL*

Stevens Institute of Technology

Towson University**

University of California, Berkeley*

University of California, Irvine***

University of the South

University of Hawaii at Manoa

University of Utah***

University of Virginia***

Xenia Community Schools, OH

INDUSTRIAL PARTNERS

3M***

Alcoa***

Bath Electric Gas & Water Systems

Bentley Mills*

KEY

* Accomplishment(s):

▶ 2015 energy data reported

▶ Showcase completed

▶ Implementation model completed

Partners with names in **bold** are energy or finance goal achievers

Briggs & Stratton Corporation***
 Bucks County Water & Sewer Authority
 Celanese International**
Cummins, Inc.***
 Darigold**
 Eastman Chemical Corporation**
 Electrolux*
 Encina Wastewater Authority
 Ford Motor Corporation**
 GE*
 General Mills***
 General Motors**
Harbec, Inc.**
 Ithaca Area Wastewater Treatment Facility*
 J.R. Simplot**
 Johnson Controls***
 LafargeHolcim (US) Inc.
Legrand North America***
 Lennox International
 Los Angeles Department of Water and Power**
Nissan North America***
 Orange Water and Sewer Authority
 Saint-Gobain Corporation**
 Schneider Electric***
 TE Connectivity*
 Toyota Motor Engineering & Manufacturing North America, Inc.**
 United Technologies Company (UTC)***
Victor Valley Wastewater Reclamation Authority*
Volvo Group North America**

BRIDGE Housing Corporation
 Cambridge, MA Housing Authority
 Campus Crest Communities
 Capitol Hill Housing**
 Cascap
 Century Housing
 Cion Housing Services
 The City of Hickory Public Housing Authority
 Codman Square Neighborhood Development Corporation
 Columbia Residential*
 The Community Builders, Inc.*
 Community Housing Partners*
 Consecra Housing Network
 Corcoran Management**
 Cuyahoga Metropolitan Housing Authority**
 Danville Development Corporation
 The DeBruler Co
 EAH Housing, Inc.
 East Bay Asian Local Development Corporation
 East Hartford, CT Housing Authority
 The Economic Development Authority of the City of Mankato, MN**
 Eden Housing
 Essex Management Company, LLC
 The Evangelical Lutheran Good Samaritan Society
 Forest City Enterprises
 Fort Wayne Housing Authority
 FS Energy
 Gary Housing Authority
 Gateway Management Services, LLC
 Gragg Cardona Partners
 Green Coast Enterprises*
 H.J. Russell & Company
 The Housing Authority of the City and County of Denver***
 Hispanic Housing Development Corporation
 Homes for America
 Housing Authority of Baltimore City*
 Housing Authority of City of Bristol, CT

Housing Authority of City of Freeport, IL
 Housing Authority of City of Helena, MT
 Housing Authority of City of Los Angeles
 Housing Authority of City of Palatka, FL
 Housing Authority of City of Philadelphia, PA
 Housing Authority of City of San Buenaventura, CA**
 Housing Authority of Knox County, IN*
 Housing Authority of McDonough County
 Housing Authority of the Birmingham District
 Housing Partnership Equity Trust
 Houston Housing Authority*
 Jamaica Plain Neighborhood Development Corporation
 Jersey City, NJ Housing Authority***
 Jewish Community Housing for the Elderly*
 Jonathan Rose Companies
 Keene Housing**
 Korman Residential Properties, Inc
 LINC Housing Corporation***
 Lucas Metropolitan Housing Authority
 Manhattan Housing Authority
 McCormack Baron Salazar
 Mercy Housing, Inc.***
 Minneapolis Public Housing Authority
 The Model Group
 Multi-Family Mission Ministries
 National Church Residences
 New Bedford Housing Authority*
 New York City Housing Authority
 Newark Housing Authority
 NewLife Homes

KEY

* Accomplishment(s):

- ▶ 2015 energy data reported
 - ▶ Showcase completed
 - ▶ Implementation model completed
- Partners with names in **bold** are energy or finance goal achievers

NHP Foundation*
 NHT/Enterprise Preservation Corporation**
 Peabody Properties, Inc.*
 Presby's Inspired Life
 Preservation of Affordable Housing**
 REACH CDC**
 The Renaissance Collaborative Retirement Housing Foundation
 Rockford Housing Authority***
 Rural Ulster Preservation Company*
 San Antonio Housing Authority*
 Satellite Affordable Housing Associates
 The Silver Street Group and Housing Management Resources*
 Schochet Companies
 Tampa Housing Authority*
 Tenderloin Neighborhood Development Corporation***
 TIAA
 Tonti Properties
 The Tower Companies
 Trinity Housing Corporation of Greeley, CO*
 Trinity Management*
 Truth or Consequences Housing Authority*
 Utica Municipal Housing Authority
 Village of Hempstead Housing Authority*
 Vistula Management Company
 VLV Development
 Volunteers of America
 Washington, DC Housing Authority
 Windsor Locks Housing Authority
 WinnCompanies*
 Wishrock Investment Group
 Yolo County, CA Housing Authority

STATE AND LOCAL PARTNERS

Arlington County, VA***
 Arvada, CO**
 Atlanta, GA***

Beaverton, OR***

Boston, MA**

Chattanooga, TN*
 Chicago, IL**
 Chula Vista, CA**
 Clark County, NV**
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 Columbia, MO**
 Commonwealth of Massachusetts***
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Will County, IL***
 Worcester, MA

FINANCIAL ALLIES

Abundant Power
AFL-CIO Pension Fund*
 BioStar Lighting*
 Bank of America
 Blue Hill Partners LLC
 CBJ Energy
 California Housing Partnership*
Citi**
 Clean Fund LLC*
 Commercial Power Partners, LLC*
Community Investment Corporation*
Connecticut Green Bank*
Energi
Enterprise Community Partners*
 GE Capital
Hannon Armstrong
 LISC
 Low Income Investment Fund
 Metrus Energy**
 PACE Equity*
 Renew Financial**
 Rockwell Financial Group
 Samas Capital
 SCIEnergy
 SparkFund*
 Structured Finance Associates, LLC*
 TBL Fund*
 Urban Ingenuity*
Ygrene Energy Fund*

KEY

* Accomplishment(s):

- ▶ 2015 energy data reported
- ▶ Showcase completed
- ▶ Implementation model completed

Partners with names in **bold** are energy or finance goal achievers

WATER PARTNERS

Aeon
Albuquerque Public Schools, NM
Atlanta, GA**
Campus Crest Communities
The City of Hickory Public Housing Authority
Corcoran Management
Cummins, Inc.*
Eden Housing
Ford Motor Company*
Fort Worth, TX
General Motors*
Gillette, WY
HARBEC, Inc.*
Hillsboro, OR*
The JBG Companies
Keene Housing*
Kohl's Department Stores

New Bedford Housing Authority*
NHT/Enterprise Preservation Corporation
Nissan North America*
Poudre School District, CO*
Saint-Gobain Corporation
Shari's Cafe & Pies**
Staples
State of North Carolina*
TIAA*
Tonti Properties
The Tower Companies*
Toyota Motor Engineering & Manufacturing North America, Inc
Transwestern
Trinity Management
United Technologies Corporation (UTC)**
USAA Real Estate Company
West Palm Beach, FL

KEY

* Water Accomplishment(s):

- ▶ 2015 water data reported
 - ▶ Showcase completed
 - ▶ Implementation model completed
- Partners with names in **bold** are water goal achievers

Endnotes

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7. Koomey, John; Growth in Data Center Electricity Use 2005 to 2010, August 1, 2011
8. Natural Resources Defense Council, Data Center Efficiency Assessment, August, 2014.
9. Lawrence Berkeley National Laboratory, The Center of Expertise for Energy Efficiency in Data Centers, 2016.
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