



Working Toward a More Innovative, Affordable, and Energy Efficient Future

PROGRESS REPORT 2019

Executive Summary	1
Better Buildings Initiative: Year in Review	3
2019 Highlights: New Goal Achievers	5
Market Leadership	7
Better Information	9
Innovation and Emerging Technologies	11
Workforce Development	13
Better Buildings Accelerators	15
Energy-Water Nexus	17
Better Buildings Solution Center	18
Getting the Word Out	19
Sector Spotlights	
Overview	21
Industrial	22
Commercial Real Estate	23
Healthcare	24
Hospitality	25
Retail, Food Service, and Grocery	26
Higher Education	27
K–12 Schools	28
State Government	29
Local Government	30
Multifamily	31
Residential	32
Data Centers	33
Financial Allies	34
Federal	35
Looking Forward	36
Partner List	37

Reducing energy waste in our nation’s buildings and plants is vital for a thriving American economy. As leading organizations in both the private and public sectors find new ways to cut costs and propel innovation, they drive technological development contributing to a cleaner, more affordable, and more resilient energy system. Through the U.S. Department of Energy’s (DOE) Better Buildings Initiative, these leaders share their proven energy efficiency strategies and inspire others to tap into the continued potential for energy efficiency. The money saved by companies, state and local governments, and school districts can be reinvested to create new jobs, products, and services, which keep the economy strong and growing.

In the past year, partners in the Better Buildings Initiative have contributed to an expanding collection of real-world solutions, energy- and water-saving resources, and best practice examples, with more than 2,500 currently available at the Better Buildings Solution Center. These solutions demonstrate the value in setting a public goal, embracing a portfolio-wide approach, making use of technological advancements, and developing smart, empowered building operators to greatly improve the energy performance of buildings and plants. In addition, they show that working collaboratively, both within and outside their organizations, is the best way to address common barriers that impede progress across sectors and building types.

Together, Better Buildings partners:

- ▶ **Achieve impressive energy savings.**
Collectively, the 900+ private and public sector organizations involved in Better Buildings have saved nearly 1.4 quadrillion British thermal units (Btus) of energy since the program began. This is a savings of nearly \$8.5 billion and more than 80 million tons of CO₂. Partners also have reduced their water use by more than 6.5 billion gallons.
- ▶ **Invest in innovative projects.**
Across all sectors of the economy, Better Buildings partners are investing in energy efficiency. Where financing remains a barrier, Better Buildings Financial Allies have extended \$19 billion in financing—including more than \$3 billion in the past year—surpassing their commitments by nearly \$7 billion. This funding is making it possible to complete innovative projects that push the market toward the further adoption of cutting-edge technologies that drive greater savings.

“ Using innovative approaches to improve energy productivity, Better Buildings partners are demonstrating leadership every day. As this administration focuses on revitalizing prosperous domestic manufacturing, we applaud the Better Buildings, Better Plants partners for adopting advanced technologies to meet their aggressive energy efficiency goals and sharing the results. In addition to saving money, these actions are helping to build a more robust workforce and resilient communities. ”



— Rick Perry
U.S. Department of Energy Secretary

- ▶ **Leverage new energy-saving technologies.**
DOE works with organizations interested in identifying and trying the latest technologies. In 2018, participants in the Better Buildings Technology Campaigns partnered with DOE on interior lighting improvements, rooftop unit replacements and retrofits, and the use of energy management systems, reporting savings of nearly \$200 million.
- ▶ **Collaborate to overcome barriers.**
Through peer-to-peer networks, Better Buildings partners are developing and implementing strategies for clean energy deployment. The resources they create are added to the Better Buildings Solution Center as toolkits, planning guides, best practices, and more.

In the coming years, DOE will continue to work with market leaders to drive innovation and ensure an affordable and more energy efficient future. We will also continue our important partnership with the U.S. Department of Housing and Urban Development (HUD) in support of the multifamily sector. In addition, we will work with partners and other stakeholders to highlight the need for a robust and skilled workforce essential to advance a more resilient and clean energy system. While there is much more to do, Better Buildings partners are demonstrating the power of partnerships in helping our nation reach its energy efficiency potential.

MARKET LEADERSHIP

Market Leadership means demonstrating what’s possible, setting aggressive portfolio-wide goals, and adopting cutting-edge technologies. For example:

More than 360 Better Buildings Challenge partners have saved \$3.8 billion since program inception.

See page 7 for more.

BETTER INFORMATION

Better Information leads to smarter decisions that support energy improvements. For example:

DOE’s Better Buildings Solution Center has more than 2,500 case studies, tools, and resources.

See page 9 for more.

INNOVATION AND EMERGING TECHNOLOGIES

Innovation and Emerging Technologies are key to building a stronger economy utilizing clean energy. For example:

Through Better Buildings Technology Campaigns, participants reduced energy use by more than 6 trillion Btus in 2018.

See page 11 for more.

WORKFORCE DEVELOPMENT

Workforce Development is essential to advance the American job force in step with technological progress. For example:

1,600 workers have participated in In-Plant Trainings since 2011.

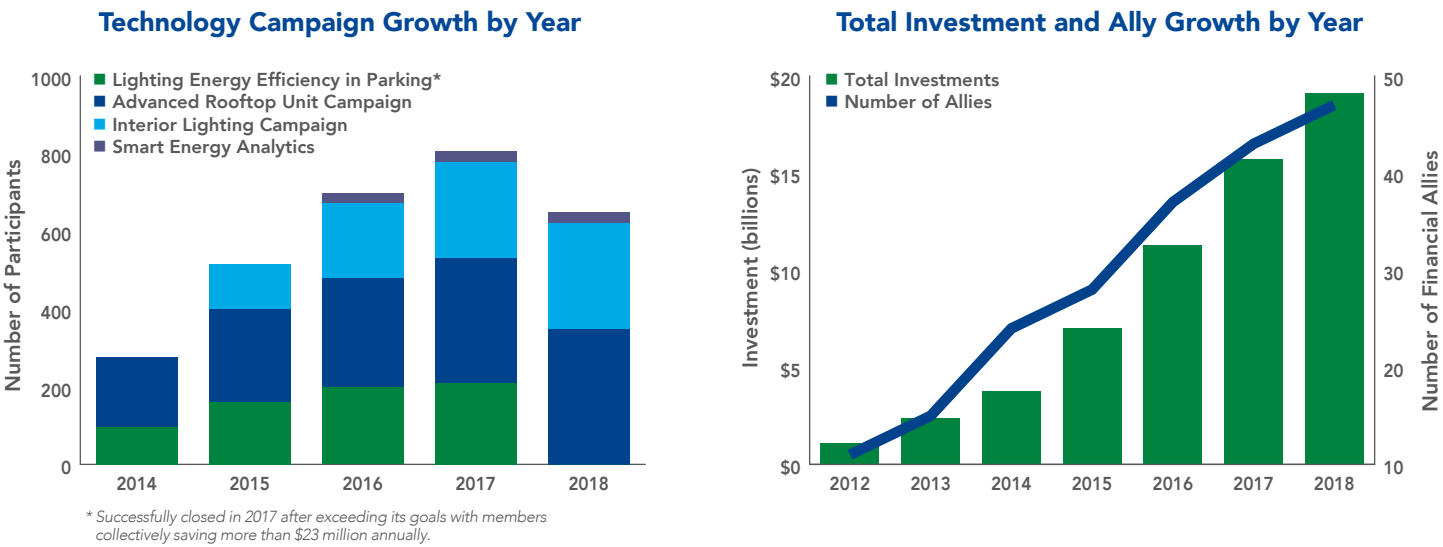
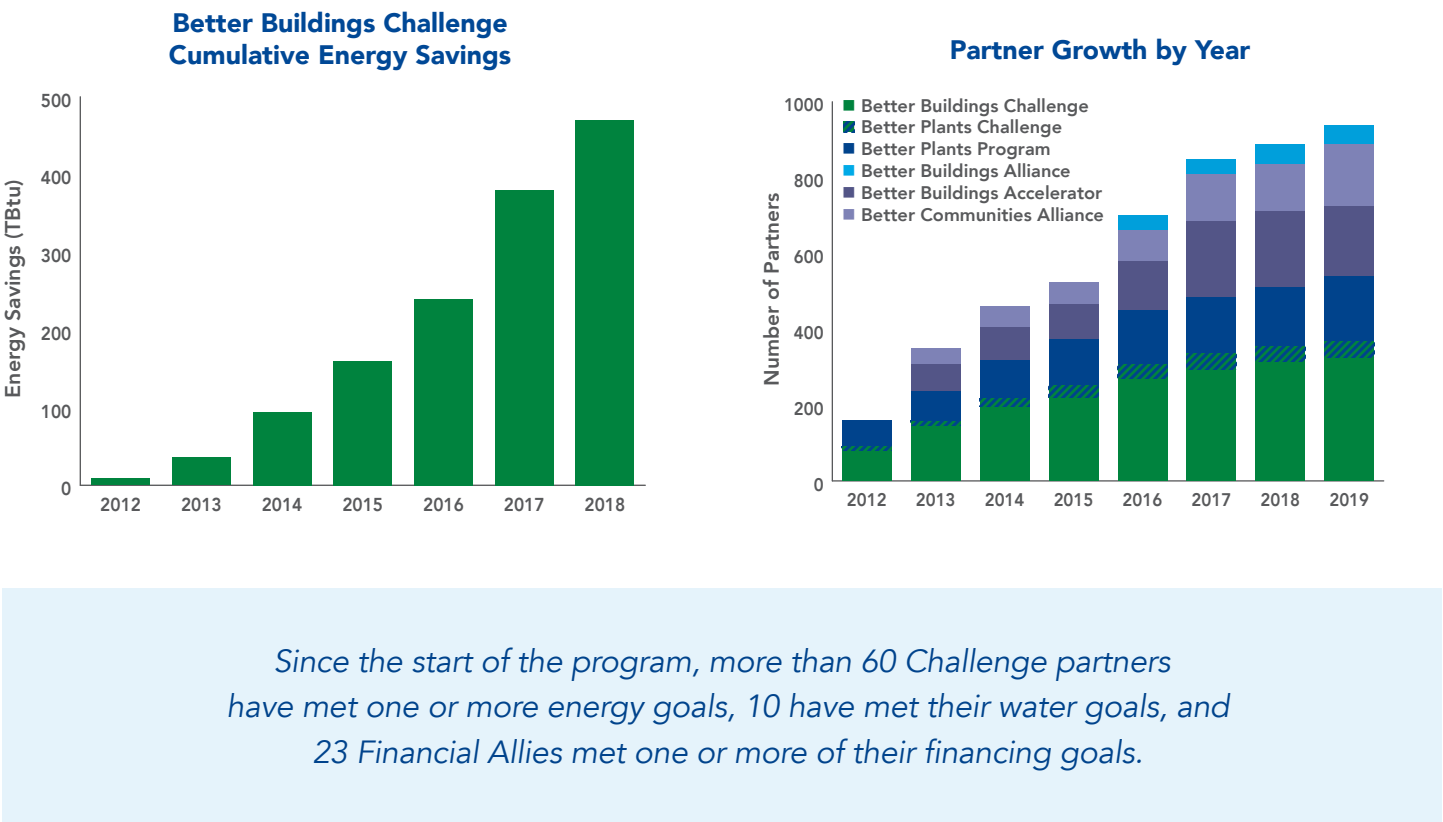
See page 13 for more.

There are more than 900 organizations that make up the Better Buildings Initiative. Together, partners represent 32 of the country's Fortune 100 companies, 12 of the top 25 U.S. employers, 12% of the U.S. manufacturing energy footprint, and 13% of total commercial building space, as well as 17 Federal agencies, 8 national laboratories, 28 states, and 90 local governments spanning the nation.


Better Buildings partners have achieved the following:

- ▶ More than 360 partners have joined the **Better Buildings Challenge**, and have collectively reported 470 trillion Btus in energy savings and \$3.8 billion in cost savings to date.
 - Through 2018, Better Buildings Challenge partners have shared energy performance results for more than 40,000 properties, and are saving an average of more than 2% in energy per year.
 - Fourteen new partners have joined the Better Buildings Challenge in the past year.
- ▶ Together, more than 215 Challenge and Program-level **Better Plants** partners located in all 50 states have reported 1.06 quadrillion Btus in energy savings and an estimated \$5.3 billion in cost savings over the past nine years.
 - More than 20 new partners have joined Better Plants in the past year.
- ▶ **Financial Allies** extended more than \$19 billion since the start of the program, including more than \$3 billion in the past year. Taken together, Allies have now surpassed their commitments by more than \$7 billion.
- ▶ Better Buildings Alliance **Technology Campaign** participants reported energy savings of more than 6 trillion Btus and cost savings of nearly \$200 million in 2018 from interior lighting improvements, HVAC rooftop unit replacements and retrofits, and the use of energy management systems.
- ▶ More than 220 **Accelerator** partners are creating new tools and strategies targeting specific barriers to clean energy deployment.
- ▶ More than 370 organizations have joined the Better Buildings **Residential Network**, completing more than 220,000 home energy upgrades to date.
- ▶ Through DOE's **strategic energy management** activities, more than 75 partners have worked to develop energy management systems that are consistent with ISO 50001.
- ▶ Partners took part in more than 20 **high-impact technology field validations** during the past year, supporting research and development into building systems optimization and technology solutions.

As DOE expands its diverse network through the Better Buildings Initiative, it is engaging with partners and stakeholders in nearly every sector. With the needs of the marketplace changing frequently, the Better Buildings Initiative continues to find new ways to connect partners and stakeholders with key resources and recognition opportunities.




Energy Savings Goal Achievers




37%

Bucks County Water & Sewer Authority is an industrial partner based in Bucks County, PA. It committed eight facilities and has a 2012 energy baseline.




24%

Las Vegas Sands is a commercial partner that committed over 19.5 million square feet and has a 2011 energy baseline.




31%

Havertys is a commercial partner located in Atlanta, GA. Having previously met its original Challenge goal, it committed 6.1 million square feet and has a 2011 energy baseline.




23%

Cambridge, MA, Housing Authority is a multifamily partner that committed 2.5 million square feet and has a 2014 energy baseline.




30%

The **City of Chattanooga, TN**, committed 2 million square feet and has a 2013 energy baseline.




23%

The **City of Roanoke, VA**, committed 1.16 million square feet and has a 2009 energy baseline.




26%

Bentley Mills is an industrial partner based in the City of Industry, CA. It committed one plant toward a second goal and has a 2014 energy baseline.



21%

Bullitt County Public Schools, KY, committed 2 million square feet and has a 2013 energy baseline.




26%

TE Connectivity is an industrial partner based in Berwyn, PA. It committed 58 properties and has a 2012 energy baseline.




21%

The **Tenderloin Neighborhood Development Corporation** is a multifamily partner based in San Francisco, CA. It committed 2.3 million square feet and has a 2012 energy baseline.




25%

Iron Mountain is a data center partner based in Boston, MA. It committed 8.75 MW across eight data centers.



20%

The **City of Atlanta, GA**, committed 100 million square feet and has a 2008 energy baseline.



24%


Kohl's Department Stores is a commercial partner based in Menomonee Falls, WI. It committed 112 million square feet and has a 2008 energy baseline.



20%

General Mills is an industrial partner based in Minneapolis, MN. It committed 25 plants and has a 2012 energy baseline.

Water Savings Goal Achievers



29%


Keene Housing is a multifamily partner based in Keene, NH. It has a water commitment of more than 430 thousand square feet and has a 2014 baseline year.



21%


The **Tenderloin Neighborhood Development Corporation** is a multifamily partner based in San Francisco, CA. It has a water commitment of 2.3 million square feet and has a 2012 water baseline year.

Financial Ally Goal Achievers




\$5.2 BILLION

Hannon Armstrong has surpassed a goal of \$1 billion in financing for energy efficiency and/or renewable energy. It is headquartered in Annapolis, MD.



\$54 MILLION

Redaptive has surpassed a goal of \$50 million in financing for energy efficiency and/or renewable energy. It is headquartered in San Francisco, CA.




\$238 MILLION

Abundant Power Group has surpassed a goal of \$100 million in financing for energy efficiency and/or renewable energy. It is headquartered in Charlotte, NC.



\$37 MILLION

Sparkfund has surpassed a goal of \$25 million in financing for energy efficiency and/or renewable energy. It is headquartered in Washington, DC.



\$90 MILLION

Greenworks Lending has surpassed a goal of \$50 million in financing for energy efficiency and/or renewable energy. It is headquartered in Darien, CT.

Previous Challenge Goal Achievers





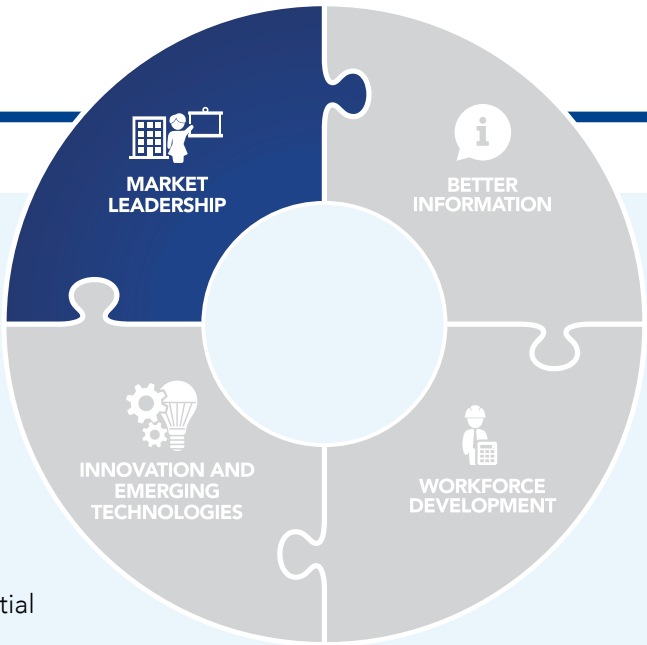
An energy reduction of 20% across the commercial and industrial sectors in the United States would save \$80 billion in energy costs per year.¹ Through the Better Buildings Initiative, organizations are demonstrating **MARKET LEADERSHIP** by committing to portfolio-wide energy reductions, transparently sharing their proven solutions to energy and water challenges, and building strong partnerships to advance common goals. The resources and best-practice examples found on page 8 are a small sampling of the many ways program partners demonstrate leadership in their respective sectors, and collectively move the market forward toward a greater adoption of proven energy efficiency measures throughout the United States.

Key Partnerships

- ▶ Better Buildings Challenge
- ▶ Better Buildings, Better Plants
- ▶ Better Buildings Alliance
- ▶ Better Buildings Accelerators
- ▶ Better Buildings Residential
- ▶ Strategic Energy Management

Recent Highlights

- ▶ The **Sustainability in Manufacturing partnership** brings DOE and the National Association of Manufacturers (NAM) together to engage directly with manufacturers, promote program resources, identify opportunities for energy efficiency improvements, and serve as a platform to recognize companies and leaders.
- ▶ The **Better Buildings Residential Network** now has more than 370 members. It provided technical assistance to more than 3,000 residential partners through a national webinar series in the past year.
- ▶ Through **high-impact technology field validations**, partners are stepping up by supporting research and development into building systems optimization and technology solutions, that span lighting, plug loads, water treatment, HVAC, and refrigeration.



The following are examples of the market leadership of partners:

- ▶ Partners such as **Walmart** and the **U.S. General Services Administration (GSA)** are testing new technologies and sharing the results with others. Walmart has seen 30% energy savings from a high-efficiency smart motor system installed at its Lakeside, CO, store, and GSA has seen energy savings of 96% and 30% from smart high-efficiency circulator pumps installed in two Lakewood, CO, facilities.
- ▶ Local governments such as **Atlanta, GA**, and **Fort Worth, TX**, are encouraging building owners to set energy efficiency goals and reduce energy use through their own energy challenge programs. Seven such programs are featured on the Better Buildings Solution Center—covering approximately 350 million square feet of building space—providing models for replication.
- ▶ The **University of California, Irvine**, hosted a two-day, in-person Smart Labs Workshop for achieving and maintaining state-of-the-art laboratory buildings, which was attended by more than 100 laboratory building owners from around the world.
- ▶ **Cleveland Clinic's** \$7.5 million Green Revolving Fund finances energy efficiency projects that reduce consumption, with a portion of the tracked savings and rebates received used to replenish the fund and drive future projects.
- ▶ Industrial partners, such as **Celanese Corporation**, **Eastman Chemical**, and **Schneider Electric**, are demonstrating how to manage and make use of large quantities of data, leveraging dynamic energy dashboards to respond to shifts in energy consumption in real time and be able to drive deeper energy savings.
- ▶ The **Massachusetts Department of Energy Resources** provides project implementation support and technical assistance to add resiliency capabilities to clean energy technologies at hospitals through its Community Clean Energy Resiliency Initiative.
- ▶ **Cummins, Inc.'s** partnership with DOE's National Laboratories has helped spark innovation and increase its global competitiveness.



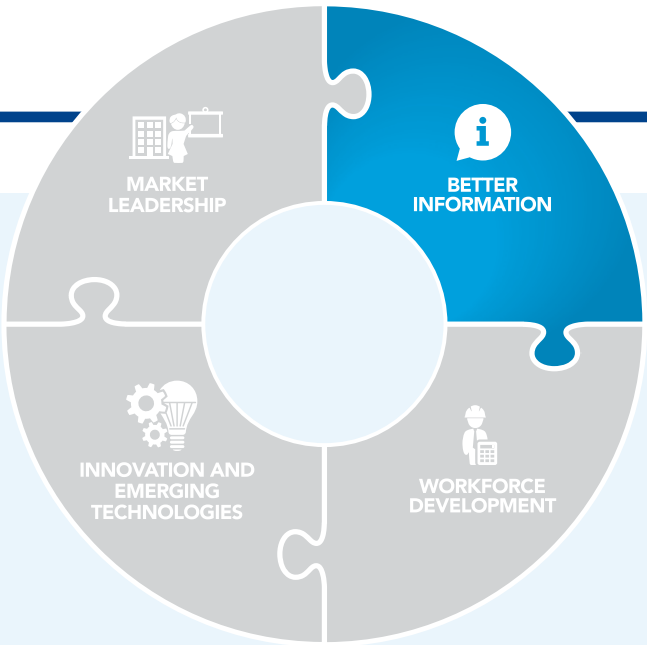
Better Information leads to more informed energy efficiency decisions that drive savings; for example, sophisticated systems that combine real-time information with algorithms to optimize energy use can reduce energy use by 20% or more in the commercial and industrial sectors.² Yet, making these energy efficiency decisions can be challenging for both public and private sector organizations. Through the Better Buildings Initiative, DOE aims to provide **BETTER INFORMATION** that can guide organizations as they implement energy programs and take action to address waste and inefficiencies throughout their buildings and operations. Having access to comprehensive and up-to-date resources, such as toolkits and online databases, can help partners make smarter investments in energy efficiency.

Key Partnerships

- ▶ Better Buildings Solution Center
- ▶ Financing Navigator 2.0
- ▶ Better Communities Alliance
- ▶ Home Energy Score

Recent Highlights

- ▶ The **Better Buildings Solution Center** has improved search functionality, and a more responsive and mobile-friendly design is also helping users access information on-the-go.
- ▶ The **Efficiency-Resilience Nexus page** was created on the Solution Center to help organizations across different sectors take steps to build resilience and increase their ability to bounce back from natural disasters and other stressors.
- ▶ The **Better Communities Alliance** launched a webinar series in 2018, with nearly 550 participants, that focuses on community solutions such as commercial PACE and other energy efficiency financing, distributed generation and resilience, Clean Cities, alternative fuels, and more.
- ▶ The **Home Energy Information Accelerator** expanded the availability of reliable energy information to ensure that consumers have access to energy cost information. Since 2015, Accelerator partners have provided training on home energy information to roughly 7,500 real estate professionals, including realtors, appraisers, brokers, and lenders.



The following are examples of resources that can help organizations make more informed energy efficiency decisions:

- ▶ The **Home Energy Information Accelerator Toolkit** was designed to expand the availability and use of reliable home energy information at relevant points in residential real estate transactions.
- ▶ The **Efficiency-as-a-Service Toolkit** was launched to summarize the trend toward “as-a-service” financing for energy technologies and highlight how Financial Allies are applying this model across sectors.
- ▶ The **Multifamily Utility Benchmarking Toolkit**, available on the HUD Exchange, provides a step-by-step guide to addressing the specific challenges of benchmarking buildings in this sector.
- ▶ The **Clean Energy for Low Income Communities Accelerator (CELICA) Toolkit** includes data and planning tools, case studies, and program models, along with access to updated state, city, and county service territory-level graphs and data.
- ▶ The **Road Map for Zero Energy K-12 Schools** distills industry expertise and partner experiences in planning, designing, constructing, and replicating zero energy schools.
- ▶ The DOE **National Lab Innovation Portal** is helping to increase communication and collaboration between the private sector and the DOE national labs, encouraging the adoption of new technologies, such as energy storage and additive manufacturing.
- ▶ The Federal Energy Management Program (FEMP) provides a range of **cybersecurity resources**, including factsheets for cyber securing control systems and lighting systems, along with other tools to actively identify, prioritize, and mitigate cyber risks.
- ▶ **Benchmarking and Transparency: Resources for State and Local Leaders** provides streamlined access to key existing resources for developing and implementing high-impact benchmarking and transparency programs.
- ▶ The Combined Heat and Power (CHP) for Resiliency Accelerator published the **Distributed Generation (DG) for Resilience Planning Guide** and the **CHP for Resilience Screening Tool** in collaboration with program partners to help communities meet their resilience goals.



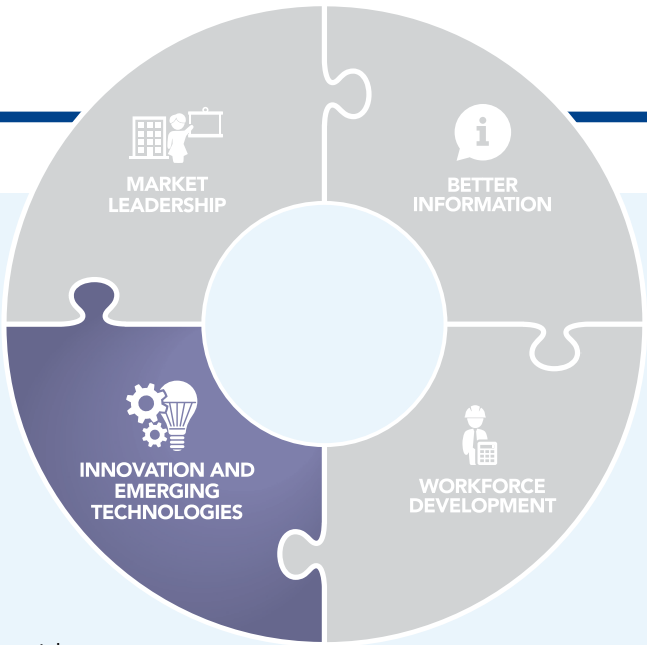
Testing early stage research and development in the real world accelerates the adoption of technologies.³ Through the Better Buildings Initiative, DOE is committed to the validation and dissemination of **INNOVATIVE AND EMERGING TECHNOLOGIES**. It does so by connecting organizations with the latest ideas for improving whole building performance, resulting in ultra-low energy buildings. See page 12 for examples of partners leading the way through the implementation of innovative technologies, ranging from microgrids to floating solar systems.

Key Partnerships

- ▶ Technology Campaigns
- ▶ High-Impact Technology Field Validations
- ▶ Better Buildings Technology Teams

Recent Highlights

- ▶ The third Better Plants **National Lab Technology Days** event was held at Lawrence Berkeley National Lab (LBNL) and Lawrence Livermore National Lab (LLNL). It connected participating companies with scientists creating cutting-edge innovations that are helping to drive American competitiveness.
- ▶ DOE's **Better Buildings Technology Teams** analyze the latest research and developments on a range of innovative building technologies and solutions, and share them in the marketplace.
- ▶ Experts from DOE's national labs lead **Technology Campaigns** that provide guidance and recognition for participants in key technology areas. Results from the past year included the following:
 - Advanced Rooftop Unit Campaign participants impacted more than 160,000 rooftop units, resulting in annual savings of more than 1.1 billion kWh and \$110 million.
 - Interior Lighting Campaign participants are on track to save nearly \$70 million by upgrading or newly installing more than 2.8 million luminaires, many with lighting control systems.
 - Smart Energy Analytics Campaign participants saved 790 billion Btus and \$18 million annually through Energy Management and Information Systems (EMIS), fault detection and diagnostics, and automated system optimization projects.



The following are examples of best practices that showcase innovation and emerging technologies:

- ▶ **Welltower** is using automated artificial intelligence battery storage technology, and a cloud-based platform to provide real-time insights, to save more than \$18,500 annually at its Santa Anita medical office building.
- ▶ **Orlando, FL**, estimates that floatovoltaic technology can meet 5% to 10% of the city's current energy load, and **Atlanta, GA**, is in the process of approving a 2.5 MW floatovoltaic installation that will produce more than 3.8 million kWh in the first year. Roughly 10% of the nation's annual electricity production could be generated with the installation of floating solar photovoltaics.⁴
- ▶ The **State of Montana** created the energy savings performance contracting (ESPC) Virtual Technical Assistant to support state and local practitioners in the face of limited budget and staff, providing step-by-step instructions and resources.
- ▶ The **National Energy Research Scientific Computing Center**, an LBNL facility, has saved nearly 2 million kWh using data analytics and ElasticSearch tools to monitor power and fan data.
- ▶ Local microgrids that can disconnect from the traditional grid and operate autonomously are providing opportunities for partners to increase energy independence and capture additional energy savings. **Montgomery County, MD**, for example, has deployed microgrids to improve resiliency at the Montgomery County correctional facility and the Public Safety Headquarters, both with no capital outlay. The **New York State Energy Research and Development Authority (NYSERDA)** is encouraging the deployment of CHP and microgrid solutions to increase energy resilience.



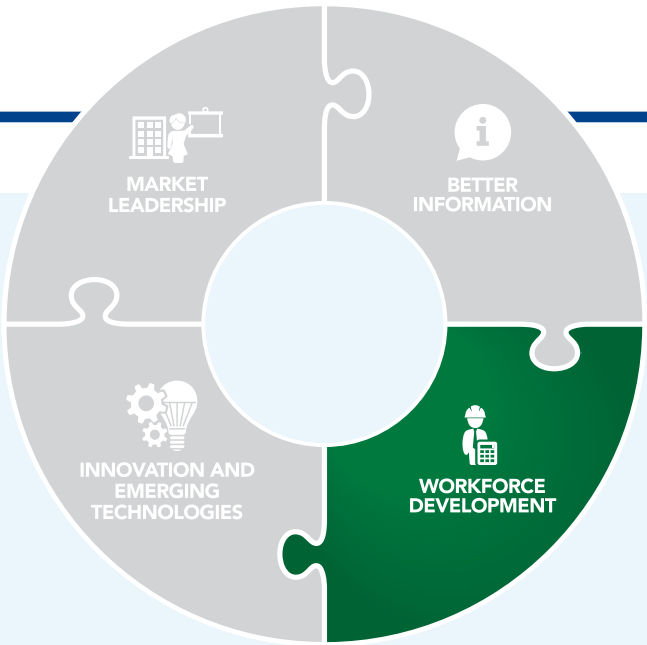
The effort to reduce energy consumption across the commercial and industrial sectors can be a significant job creator; these jobs can at least partially pay for themselves through energy savings, as efficiencies of 10% to 25% have been demonstrated when hiring certified HVAC installers, electricians, and maintenance staff over non-certified installers.⁵ DOE is helping to promote **WORKFORCE DEVELOPMENT** by sharing examples of the successful efforts of partners to increase the skill sets of new and existing employees through activities such as apprenticeship programs and on-the-job trainings.

Key Partnerships

- ▶ Industrial Energy Management Workforce
- ▶ Workforce Guidelines

Recent Highlights

- ▶ Since 2011, roughly 1,600 industrial workers participated in **In-Plant Trainings**, which prepare participants to identify, implement, and replicate energy-saving projects and practices.
- ▶ Through DOE's **Industrial Assessment Centers**, university students from across the country have conducted more than 18,000 no-cost energy assessments, not only helping small- and medium-sized manufacturers save energy, but also gaining valuable training for engineering careers.
- ▶ Nearly 100 people have been certified as **50001 Energy Management Systems Certified Practitioners** since 2012.
- ▶ The Better Buildings **Workforce Guidelines** program has recognized certification programs for key energy-related jobs, including Building Energy Auditor, Building Commissioning Professional, and Energy Manager.



The following are examples of best practices for workforce development:

- ▶ The **University of Maryland Medical Center** is expanding beyond its internal apprenticeship program by working with the City of Baltimore and local organizations to launch the Stationary Engineer Apprentice Collaboration Program.
- ▶ **Medford, MA, Orlando, FL, and Knoxville, TN**, have partnered with local universities to establish internship programs, giving undergraduate and graduate students valuable, hands-on experience in municipal energy offices.
- ▶ New skilled trades and facilities management professionals are graduating from apprenticeship programs at leading colleges and universities, including **Northwestern University** and the **University of Virginia**.
- ▶ **Atlanta Better Buildings Challenge** reported more than 220 local jobs being created for roles such as construction, energy management, HVACR, and building envelope materials.
- ▶ **Raytheon** and other companies have leveraged the Energy Treasure Hunt in plant training and toolkit to run events, engage employees in identifying energy saving opportunities, and track results.
- ▶ The **Los Angeles Unified School District, CA**, is providing students with high-level industry skills and work experience beyond the classroom in partnership with the California and Los Angeles Conservation Corporations, under the Proposition 39 program.
- ▶ **Loews Hotels & Co.** and **Saunders Hotel Group** are helping workers who have been dislocated or unemployed gain skills in energy building management, through the Building Energy Efficient Maintenance Skills job training partnership with the Asian American Civic Association.
- ▶ **New York City Housing Authority** has developed a workforce development resource—the NYC Training Guide—to serve as a research tool that matches job seekers with appropriate training programs and promotes career advancement.
- ▶ **Kilroy Realty** piloted a Green Janitor Education program to provide training on sustainability best practices, resulting in annual cost savings of more than \$20,000 and improved work environments for janitors and tenants.

Better Buildings Accelerators are collaborative, peer-to-peer networks designed to facilitate learning and leadership opportunities that result in new strategies and practices in clean energy deployment. Accelerators focus on partner-identified areas that aim to overcome persistent barriers to clean energy options. Accelerators are issue-specific, time-bound, and results-driven. Since 2013, DOE has launched 15 Accelerators involving more than 220 partnering organizations across the private, public, and non-profit sectors.

8 Million Students

ZERO ENERGY SCHOOLS

23 partners across districts, states, and NGOs represent more than 8 million students.

Participants demonstrate successful strategies for the design and maintenance of zero energy schools.

12.3 Million kWh

SUSTAINABLE WASTEWATER INFRASTRUCTURE OF THE FUTURE (SWIFt)

12.3 million kWh saved by partners while treating wastewater.

State, regional, and local organizations in SWIFt partner with water resource recovery facilities to improve energy efficiency by at least 30%.

75 MW Energy Load

DATA CENTERS

23 partners with more than 75 MW of electric load are working toward improving data center operations that yield significant energy and cost savings.

Partners commit to reducing the infrastructure energy intensity of one or more data centers by 25% over a period of five years by focusing on consolidation, improving computing operations, and optimizing equipment cooling.

\$355 Million

CLEAN ENERGY FOR LOW INCOME COMMUNITIES ACCELERATOR (CELICA)

\$355 million are allocated by partners to support access to clean energy for 155,000 low-income homes.

Participants of this successfully completed Accelerator have developed plans that identified affordable energy solutions for low- to moderate-income communities.

6 Million Square Feet

ZERO ENERGY DISTRICTS

6 district partners representing more than 1,000 acres of development are working to achieve ultra-high energy performance across more than 6 million square feet of buildings.

Districts are using cost-effective pathways to meet zero energy goals through shared infrastructure, ultra-efficient building design, renewable energy, and innovative business models.

17 Lab Partners

SMART LABS

17 partners, with more than 9 million square feet of laboratory buildings, are working toward innovative strategies to rapidly reduce energy usage and improve safety.

Universities, Federal agencies, and national labs commit to at least 20% energy savings for their laboratory buildings, specifically addressing the design and operation of the laboratory's ventilation system.

7,500 Professionals

HOME ENERGY INFORMATION

More than 7,500 real estate professionals are trained on home energy information.

Partners of this successfully closed Accelerator made significant progress increasing access to, and use of, reliable and standard home energy information in real estate transactions.

24 Partner Communities

COMBINED HEAT AND POWER (CHP) FOR RESILIENCY

24 partner communities assessed their critical infrastructure for CHP opportunities and shared accomplishments in resilience planning and project implementation.

Participants of this successfully completed Accelerator helped communities capitalize on CHP's strengths as a reliable, high-efficiency, low-emissions source of electricity and heating/cooling for critical infrastructure.

New Accelerators

- **Packaged Combined Heat and Power (CHP):** Partners in this Accelerator will validate that installation times and total project costs for packaged CHP systems can be reduced by 20% or more, and will evaluate the integration of new technologies with packaged CHP systems.
- **Building Energy Data Analysis:** This Accelerator will focus on the development and testing of a unique building identifier that enables spatial tagging to reduce the barriers to, and cost of, joining data sets, improving how building energy data can be used for research and cost-effective investment decisions.

Water and energy are critical, mutually linked resources because large quantities of water are often needed for fuel production, hydropower, and thermoelectric power plant cooling. Likewise, a high level of energy is necessary for the pumping, treatment, and distribution of drinking water and the collection, treatment, and discharge of wastewater. Wastewater treatment and drinking water plants typically are the largest energy consumers for many municipalities, often accounting for 30% to 40% of total energy consumed by city-owned properties.⁶ By incorporating energy efficiency practices into their water and wastewater plants, municipalities and utilities can save 15% to 30%.⁷ Through the Better Buildings Initiative, partners from all sectors are taking action to reduce water use and consequently save both energy and money within their operations.



Partners with Greatest Water Savings

Savings Since Baseline Year

Shari's Cafe & Pies*	38%
Anthem, Inc.*	32%
Staples*	30%
Keene Housing*	29%
Tenderloin Neighborhood Development Corporation*	21%
United Technologies Corporation (UTC)	18%

*Water goal achiever

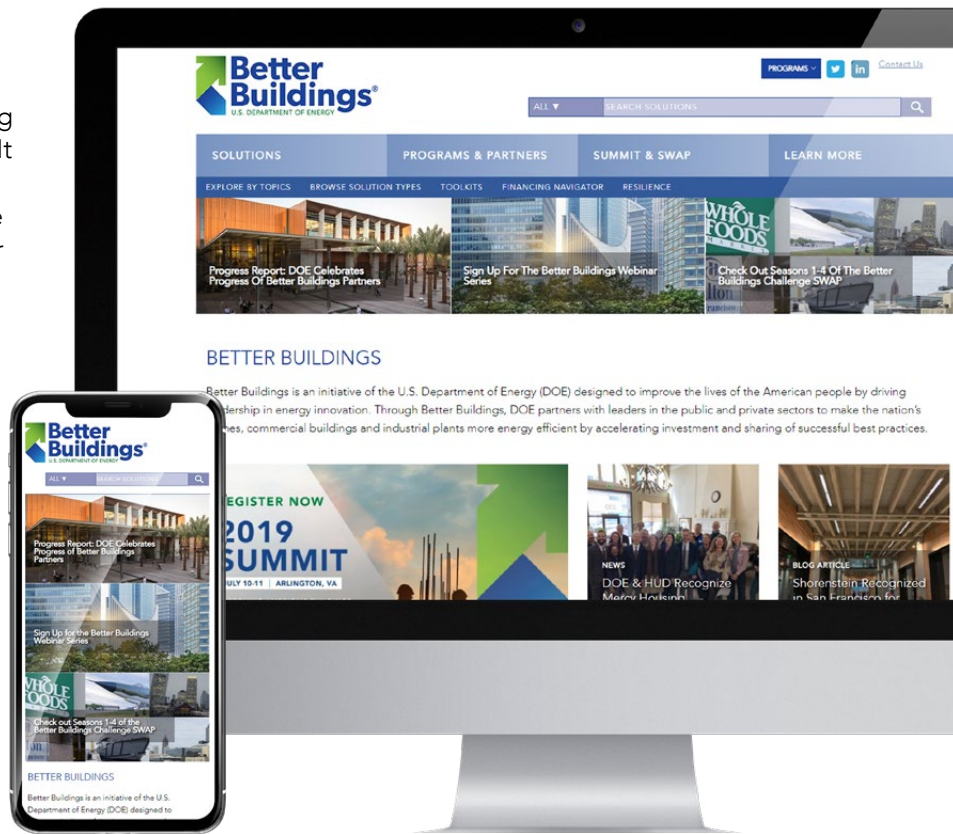
Resources and Partner Solutions

- ▶ **Energy Savings Performance Contracting (ESPC) Guide for Water Resource Recovery Facilities:** This guide provides an overview of the ESPC process and the energy efficiency potential for the wastewater sector, and includes case studies of ESPC projects in water resource recovery facilities.
- ▶ **Healthcare Water Efficiency and Program Management Toolkit:** This toolkit serves as a hub for relevant resources and solutions to provide guidance on how healthcare facilities can achieve significant operating cost and energy savings without jeopardizing water quality and maintaining control of infection.
- ▶ **Digester Biogas Generation & CHP Project:** The Los Angeles Bureau of Sanitation is generating all required electricity and steam on-site and reducing the energy intensity at its Hyperion Water Reclamation Plant by 37% over two years.
- ▶ **University of Utah Health Care Interdepartmental Committee:** The committee focuses on water efficiency to identify alternative sources for irrigation and industrial processes and to quantify savings, supporting the business case for water efficiency campus-wide.
- ▶ **Industrial Water Efficiency In-Plant Training:** This training will leverage multiple resources and bases of knowledge to enable organizations to improve water efficiency within their plants. The newly developed Plant Water Profiler tool enables end users to establish a water baseline and water balance, determine their site's true cost of water, and identify water-saving opportunities. The tool and associated training materials emphasize the water-energy nexus to enable organizations to capitalize on opportunities that yield water and energy savings simultaneously.

The Better Buildings Solution Center is an online tool designed to help organizations easily find proven and cost-effective energy and water efficiency solutions by topic, building type, sector, technology, location, and barrier. It also serves as the primary platform for sharing Better Buildings partner successes. There were more than 330,000 visits to the Solution Center in 2018.

New on the Solution Center

- ▶ **The Efficiency-Resilience Nexus Page:**
Information to help withstand and bounce back from natural disasters and other stressors.
- ▶ **CELICA Toolkit:**
Resources to support residential energy efficiency and renewable energy for low-income households.
- ▶ **Sector Financing Primers:**
A collection of financing guides created to meet the unique needs of different sectors.



Most Viewed Solutions in the Past Year



1. **Better Buildings Financing Navigator 2.0:** A tool to help users learn the basics of the energy efficiency and renewable energy financing market, compare financing options, and connect with Better Buildings Financial Allies.



2. **Combined Heat and Power (CHP) Project Profiles Database:** A database of more than 130 CHP Project Profiles to promote and assist in transforming the market for CHP, waste heat to power, and district energy technologies.



3. **Energy Savings Performance Contracting (ESPC) Toolkit:** A way for state and local communities to benefit from the experience of partners who have successfully established and implemented performance contracting.



4. **Commercial PACE Financing for Resiliency Toolkit:** A set of resources for funding resiliency improvements to make buildings more resistant to natural disasters and other threats.



5. **The Business Case for High-Performance Buildings:** A course originally developed for real estate brokers that shows how energy and sustainability in high-performing buildings provide value for property owners and commercial tenants.

Recognizing Leaders

Bullitt County Public Schools

Mt. Washington Elementary School achieved 32% annual energy savings and \$28,000 in annual costs savings. The Bullitt County Public Schools District encourages students and faculty to take responsibility for using energy efficiently.



REI

REI's LEED® Platinum distribution center in Goodyear, AZ, is designed to be a zero energy facility. The 400,000-square-foot facility employs more than 200 people and supports more than 40% of the co-op's sales.



Martin Guitar

At its Nazareth, PA, plant, Martin Guitar exceeded its expectations by cutting electricity use by 46% and natural gas consumption by 20%. These savings translated into a 27% improvement in energy intensity and more than \$500,000 in reduced annual energy costs.



Mercy Housing and Tenderloin District

Mercy Housing and the Tenderloin Neighborhood Development Corporation work to preserve affordable housing and services for low-income families and individuals in the Tenderloin neighborhood of San Francisco.



Engage with the Better Buildings Initiative

 **Newsletter**
energy.gov/bbbsc

 **Beat Blog**
energy.gov/bbbsc

 **Twitter**
[@BetterBuildingsDOE](https://twitter.com/BetterBuildingsDOE)

 **LinkedIn**
[BetterBuildings](https://www.linkedin.com/company/BetterBuildings)

 **YouTube**
[BetterBuildingsDOE](https://www.youtube.com/BetterBuildingsDOE)

Better Buildings, Better Plants Summit

The Better Buildings, Better Plants Summit, held this year in **Arlington, VA, from July 10–11, 2019**, is a celebration of energy efficiency leadership. This annual event provides an opportunity for professionals to explore emerging technologies and share innovative strategies in energy and water efficiency. Attendees participate in two days of interactive sessions with industry experts and market leaders, as well as many opportunities to network with peers.

Summit Highlights

- ▶ Dedicated tracks on key issues such as resilience, emerging technologies, and workforce development
- ▶ Discussions on barriers and opportunities for energy and water efficiency, waste reduction, and employing renewable energy
- ▶ Sector networking opportunities and the chance to consult with a wide range of subject matter experts

Learn more at betterbuildingsinitiative.energy.gov/summit

Partners in the Headlines

Energy Improvements Across the Board

“ Together, the electricity and natural gas savings translated into a 27% improvement in energy intensity at the C.F. Martin Guitar plant.”⁸

Historic Airport Terminal Realizes Massive Savings from Deep Energy Retrofit

“ By incorporating high-efficiency energy technologies and practices into the airport's heating, cooling, and lighting systems, King County produced an impressive 60 percent energy savings and \$31,000 per year in cost savings...”⁹

Training, efficiency and cost savings: Fostering the next generation of facilities professionals

“ These apprentices have been a vital part of the work that has allowed the University of Maryland Medical Center to achieve overall energy cost savings of \$1.6 million from its 2012 baseline...”¹⁰

L.A. Unified School District Recognized by U.S. Dept. of Energy

“ Santee Education Complex is on schedule to achieve 30% annual energy savings this year. As a result of these upgrades, the school expects to achieve a 23% annual cost savings, equal to more than \$195,000 yearly.”¹¹

Summit Social Media Engagement



@ACEEEdc: Interested in exploring emerging #energyefficiency #tech? Want to meet industry experts and market leaders in your field? Check out @BetterBldgsDOE's #BBSummit2019 for the conference with all that and more!



@martaschantz: Excited that @BetterBldgsDOE and Real Estate Research Institute are funding new studies on the impact of #energyefficiency and green building certifications on financial performance. Yes! Looking forward to these results to build that “business case 2.0”



@2degreesOliver: Love this. @LOrealUSA & @GM's energy teams did treasure hunts & discovered savings from each other's facilities. We need much much more of this! Right at the heart of why @Manufacture2030 exists. A must watch & great work.



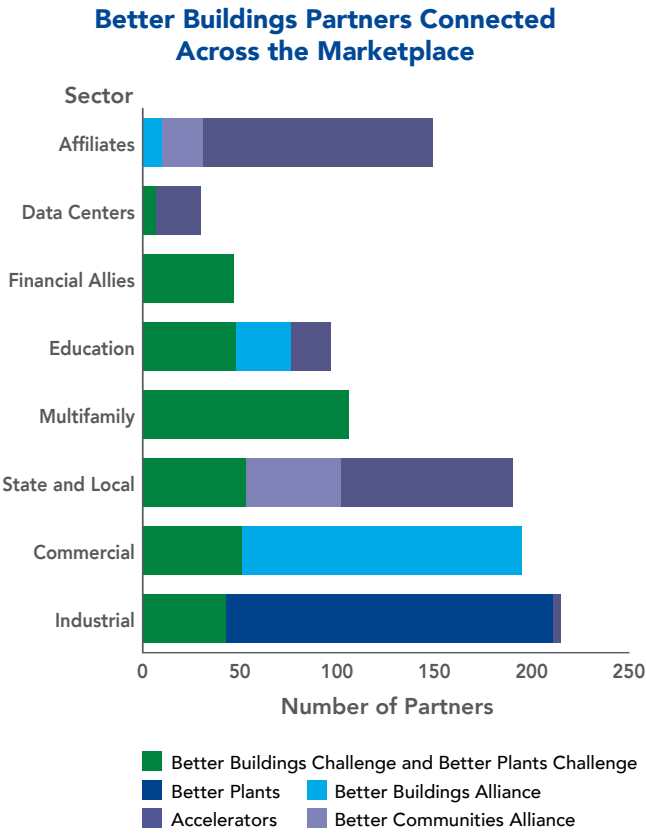
Jason Hartke, President, Alliance to Save Energy: [The Summit] is a great event that pulls together thought leaders from the commercial, industrial, education, and state and local government sectors ... to exchange best practices and highlight demonstrated market solutions while hearing about future opportunities.



Partners within the Better Buildings Initiative represent organizations from nearly every corner of the American economy. While their portfolio of buildings, plants, and facilities may vary in terms of size, age, and operations, they share a commitment to greater energy, water, and waste efficiency. Many partners have already set water reduction goals under the program’s complementary Water Reduction Initiative, and will now have the opportunity to also set waste reduction goals under the recently launched Better Buildings Waste Reduction Pilot.

In addressing common energy concerns and opportunities, partners are leading by example and showing that barriers are meant to be broken. Topics that are relevant across sectors include workforce development, managing the efficiency-resilience nexus, approaching zero energy, leveraging new and innovative financing options, and implementing internal engagement strategies that build support at all levels within organizations.

The content in the following Sector Spotlights illustrates the many ways partners are leading the way and driving efficiency in the marketplace. They do so by sharing best practice examples, proven strategies, and by contributing to the development of new resources that lead to lower costs and a cleaner, more resilient energy system.



Better Buildings Partners Are

32
of the Fortune 100 Companies

13%
of all U.S. Commercial Building Space

8
National Laboratories

90
Local Governments

28
State Governments

12
of the Top 25 U.S. Employers

12%
of the U.S. Manufacturing Energy Footprint

215

UNIQUE
SECTOR
PARTNERS

43

CHALLENGE
PARTNERS

172

BETTER PLANTS
PARTNERS

3,200 FACILITIES

\$5.3 BILLION SAVED SINCE 2009

Challenge Partners with Greatest Energy Savings

2018 Reported Savings Since Baseline Toward Initial Goal

Bucks County Water & Sewer Authority*	37%
Bentley Mills*~	26%
TE Connectivity*~	26%
General Mills*	20%
United Technologies Corporation (UTC)*~	16%
Solberg Manufacturing Inc.	15%
J.R. Simplot – Agricultural Group	15%

* Goal achiever

~ Previously met Program Level goal

Challenge Partners That Met the 25% Goal and Re-pledged

Savings Since Baseline Year

Victor Valley Wastewater Reclamation Authority	25%
HARBEC	18%
Volvo Group North America	17%
Schneider Electric	10%

Manufacturing has an enormous economic impact in the United States, accounting for almost 13 million jobs.¹² Industrial organizations are increasingly recognizing the importance of sustainability: In one recent NAM survey, approximately 72% of manufacturers said they have implemented a sustainability policy, with an additional 8% reporting that one is under development.¹³ Energy efficiency is both a key sustainability driver and pathway to cost savings. Better Plants has supported partners in the past year with the following tools and resources:

- ▶ The third annual [Technology Days](#) event at Lawrence Berkeley National Laboratory and Lawrence Livermore National Laboratory was held in April 2019. Energy management and R&D staff toured lab facilities, networked with experts, and learned how to collaborate with the labs on technology R&D.

Leadership in Action

- ▶ **Schneider Electric** is the first partner to join the new Better Buildings, Better Plants Waste Reduction Pilot, committing to a goal of 95% waste-to-landfill diversion within 12 years.
- ▶ A **General Mills** biogas system at its Murfreesboro, TN, facility is using leftover Greek yogurt whey and wastewater to generate 1.6 MW of electricity annually, or 10% of the facility's needs. By capturing waste heat, General Mills has reduced the plant's natural gas needs by an additional 10%, saving the partner a combined \$2.4 million per year on energy costs.
- ▶ As a result of one-on-one visits and attendance at the Better Plants Technology Days, partners such as **Celanese Corporation** and **Owens Corning** are exploring collaboration with national labs in areas including ultrasonic drying and the utilization of geothermal and other renewable energy technologies.
- ▶ **AstraZeneca** installed a 2.5 MW natural gas-fired CHP system at its Gaithersburg, MD, campus to supply electricity, hot water, and steam, helping the site achieve almost 14% in annual source energy savings.
- ▶ The open-source [MEASUR system software tools suite](#) continues to be expanded to provide more resources for industrial partners and other users, with steam and compressed air system assessment platforms being added to existing pumping, process heating, and fan system assessment platforms by the end of 2019. The new tools include more than 40 calculators that can be used by plant-level personnel to perform preliminary analyses on industrial systems.



77
UNIQUE
SECTOR
PARTNERS

19
CHALLENGE
PARTNERS

58
ALLIANCE
PARTNERS

6.6 BILLION SQUARE FEET

\$189 MILLION SAVED SINCE 2011

Challenge Partners with Greatest Energy Savings
Savings Toward Initial Goal Since Baseline Year

The Hartford Financial Services Group, Inc.*	34%
Lendlease*	33%
Anthem, Inc.*	27%
Columbia Association*	24%
Shorenstein Properties*	23%
The Tower Companies*	20%
CommonWealth Partners	15%
Nuveen Real Estate (formerly TH Real Estate)	14%
LBA Realty	13%

*Goal achiever

The U.S. office market consumes more than 20% of all commercial building electricity use, which means that cost-effective upgrades can yield big savings for both tenants and landlords.¹⁴ Commercial real estate (CRE) partners continue to reduce energy and water consumption across their building portfolios by making use of the latest innovative technologies, and many are championing efforts in tenant efficiency, workforce development, and the efficiency-resilience nexus. In the past year, the CRE sector helped address the following barriers:

- ▶ Portfolio risk scoping is an increasingly important priority for the sector. The Better Buildings Solution Center [Resilience page](#) was launched for companies to access resources around the energy efficiency-resilience nexus, helping to minimize vulnerabilities through resilience planning and decreasing energy demand in facilities.
- ▶ Recent research has indicated that energy factors such as price and use can affect the risk of commercial mortgage default. The sector has developed a

Leadership in Action

- ▶ **DWS** and **Shorenstein Properties** have set new energy savings goals after achieving their initial Better Buildings Challenge goals.
- ▶ **Columbia Association** implemented a rooftop unit replacement plan across its portfolio, helping to surpass its energy reduction goal by achieving 24% portfolio-wide savings; it then set an additional 10% energy reduction goal.
- ▶ **The Tower Companies** emphasized sustainability and resident health and wellness in their design of The Pearl, resulting in an ultra-efficient building that was the first-ever Fitwel certified multifamily property.
- ▶ **The U.S. General Services Administration** completed lighting upgrades at the William Jefferson Clinton Building, reducing energy use by 64% and receiving recognition from the Interior Lighting Campaign.
- ▶ **Tishman Speyer** installed integrated fault detection and diagnostics software at The Franklin, contributing to a decrease in whole building energy use of 9% and receiving recognition from the Smart Energy Analytics Campaign.

[research primer](#) for real estate owners and investors to understand how a building's energy risk score can be used to mitigate risk during underwriting.

- ▶ Improving the efficiency of tenant spaces remains a priority for the industry, and many CRE partners have been recognized through the [Green Lease Leaders](#) and [ENERGY STAR® Charter Tenant Space](#) programs for creating sustainable landlord-tenant relationships.



43

UNIQUE
SECTOR
PARTNERS

9

CHALLENGE
PARTNERS

34

ALLIANCE
PARTNERS

490 MILLION SQUARE FEET

\$195 MILLION SAVED SINCE 2011

Challenge Partners with Greatest Energy Savings

Savings Toward Initial Goal Since Baseline Year

UW Health*	25%
Cleveland Clinic Foundation	19%
University of Maryland Medical Center	12%
University of Pittsburgh Medical Center	12%
University of Nebraska Medical Center	11%

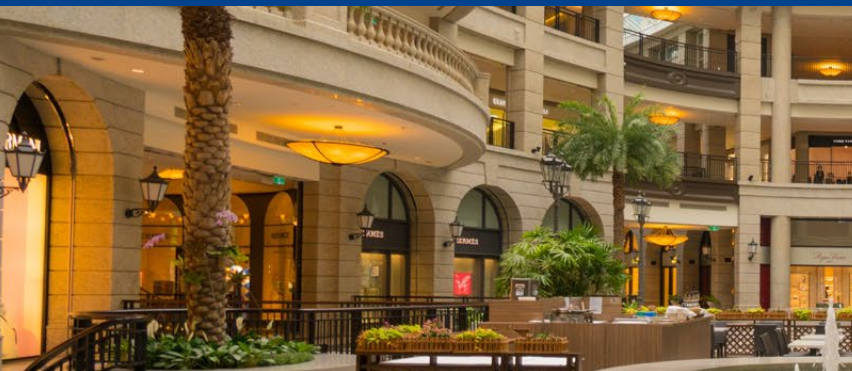
*Goal achiever

Healthcare organizations spend more than \$6.5 billion on energy each year, and the industry continues to be one of the fastest growing in our economy.¹⁵ As patient care needs continue to increase alongside advances in medical technology, implementing energy efficiency strategies can have a direct impact on an organization's bottom line and the ability to invest in patient care. Better Buildings Healthcare partners are working to address the following sector priorities:

- ▶ Obtaining high-level buy-in for energy and infrastructure projects remains a challenge. Partners are strengthening internal engagement and communications strategies by building internal advocacy capabilities to effectively communicate the business case to institutional leadership and employees, and sharing solutions through a Social Media Engagement Series.
- ▶ Capital is limited to fund sustainability improvement projects when competing against clinical needs. Partners are leveraging funding strategies, such as green revolving funds, energy savings performance contracts, utility rebates, and clean energy funds—all noted in the [Healthcare Sector Financing Primer](#), a newly published comprehensive collection of resources on funding strategies to guide healthcare institutions.

Leadership in Action

- ▶ **UW Health** set a [new energy savings goal](#) after meeting its initial Better Buildings Challenge goal.
- ▶ **Kaiser Permanente's** Richmond Medical Center's renewable microgrid system combines a solar photovoltaic (PV) structure with a battery storage unit to provide 365,000 kWh of clean energy annually and reduce peak energy demand, providing life safety backup power to the critical care load at the facility.
- ▶ **Mayo Clinic's** Rochester Campus increased its energy reduction commitment to 30% by 2025 after hitting its 20% reduction goal, and is deploying energy management guidelines to include defined energy use intensity targets for new and existing buildings, standardized efficient operational procedures, and established measurement and verification to achieve deeper savings.
- ▶ The **University of Nebraska Medical Center** has achieved an 11% energy savings with the support of its [LiveGreen Ambassadors Program](#) and the deployment of campus engagement tools that build sustainability skills among employees and students.
- ▶ **Beaumont Health** is saving 2.2 million kWh of energy annually after retrofitting more than 8,700 fluorescent troffers with LED fixtures, receiving [recognition](#) from the Interior Lighting Campaign.
- ▶ Optimizing the long-term resiliency and sustainability of healthcare campuses can be achieved by integrating innovative energy and water savings technologies. The [Healthcare Water Efficiency and Program Management Toolkit](#) was created to provide guidance on how healthcare facilities can realize significant operating cost and energy savings without jeopardizing water quality and maintaining control of infection.



16

UNIQUE
SECTOR
PARTNERS

6

CHALLENGE
PARTNERS

10

ALLIANCE
PARTNERS

1 BILLION SQUARE FEET

\$142 MILLION SAVED SINCE 2011

Leadership in Action

- **MGM Resorts International** implemented a wireless control network at its Mandalay Bay Convention Center, digitizing more than 1,600 new LED lighting fixtures, leading to an 80% reduction in lighting energy use and earning recognition from the Interior Lighting Campaign.
- **Las Vegas Sands** held a Green Ideas Challenge for resort staff as a way for employees to identify areas of opportunity for energy or water savings. Two of the top three ideas implemented included installing motion sensors on faucets in dishwashing areas and re-calibrating bathroom faucet sensors to not run longer than necessary. Ultimately, these upgrades resulted in saving an estimated 960,000 gallons of water annually.
- **Hilton** developed an internal dashboard to help prioritize energy efficiency opportunities across its managed properties. The dashboard, developed by Hilton’s Environmental Defense Fund Climate Corps Fellow, tracks 13 key energy conservation measures, from low-cost LED lighting to advanced building analytic systems. The dashboard enables Hilton’s regional engineering leaders to visually identify gaps and prioritize future projects that contribute to Hilton’s Travel with Purpose goal to cut its environmental footprint in half by 2030.
- Smaller regional hotel owners and operators are interested in identifying ways to better engage with their local utilities on energy efficiency. A [guide to working with local utilities](#) was developed to share Better Buildings partners’ success stories in leveraging utility incentives and services to implement energy efficiency upgrades at their properties.

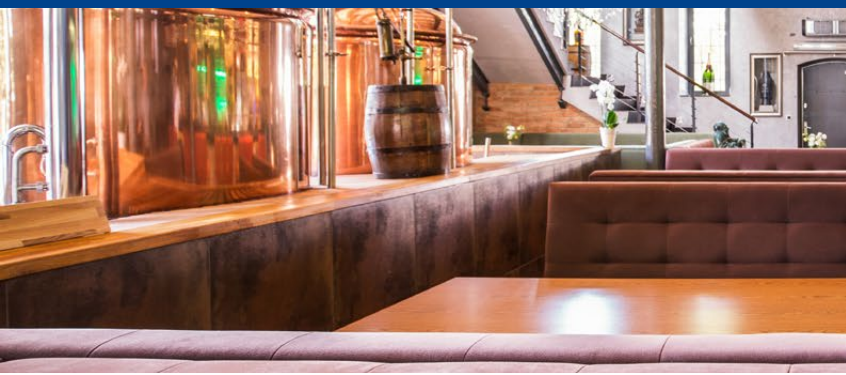
Challenge Partners with Greatest Energy Savings
Savings Toward Initial Goal Since Baseline Year

Las Vegas Sands*	24%
Loews Hotels & Co.	19%
MGM Resorts International	14%
Hilton	8%
Saunders Hotel Group	8%

*Goal achiever

Hotel owners nationwide are recognizing customers’ growing interest in sustainability as 68% of travelers are more likely to consider an accommodation knowing that it is eco-friendly.¹⁶ The benefits of committing to environmentally friendly practices include improved guest comfort and satisfaction, as well as significant cost savings from more energy efficient operations. Better Buildings hospitality partners are demonstrating leadership by setting aggressive sustainability goals at the corporate level and making conscious efforts to engage staff in energy efficiency efforts at all levels of the organization. Throughout the past year, the Hospitality sector has helped advance the following priorities:

- Hotel owners are continuously looking for ways to identify and vet cost-effective energy-saving technologies that can be implemented without compromising guest comfort. Hospitality partners contributed to the Better Buildings Technology Pilot Project Map, sharing best practices for creating internal processes for verifying new technologies.
- There continues to be opportunities to engage franchise owners in energy efficiency best practices. Stakeholders, such as the Asian American Hotel Owners Association and Boston Green Tourism, provide customized energy and water efficiency resources to franchises to address barriers, such as accessing capital for projects and identifying low- and no-cost opportunities for efficiencies.



71

UNIQUE
SECTOR
PARTNERS

29

CHALLENGE
PARTNERS

42

ALLIANCE
PARTNERS

2.7 BILLION SQUARE FEET

\$1.72 BILLION SAVED SINCE 2011

Challenge Partners with Greatest Energy Savings

Savings Toward Initial Goal Since Baseline Year

Best Buy*	32%
Havertys*	31%
Arby's*	26%
Kohl's Department Stores*	24%
Macy's*	23%
Wendium of Florida, Inc. (Wendy's franchisee)*	21%
Shari's Cafe & Pies	18%
Whole Foods Market	17%
Staples	14%
Walgreens Co.	12%
The Wendy's Company	12%

*Goal achiever

Leadership in Action

- **Wendium of Florida, Inc.** became the first franchisee of The Wendy's Company to meet its Challenge goal, achieving 21% energy savings across its portfolio of 18,000 square feet.
- **Havertys** achieved a second energy savings goal after meeting its initial Better Buildings Challenge goal.
- **Target** upgraded 1.5 million fixtures to LED in 2017, saving 300 million kWh, and is also integrating smart fixtures with built-in technology that interacts with the Target app, resulting in a total of 2 million smart LED fixtures now operating across 1,800 stores.
- **Sprint** and **Ulta Beauty** both incorporated green lease language into their corporate-level policies and leasing documents—with nearly 75% and 50% of their commercial properties under a green lease, respectively—receiving Green Lease Leaders recognition in the tenant category.
- **H&M** established a company-wide "closed door" policy after demonstrating an annual average savings of \$10,000 per store by closing the exterior doors, with no discernible impact on foot traffic.
- **Life Time Fitness** implemented creative solutions that resulted in significant reductions in rooftop unit runtimes and increased performance, earning recognition from the Advanced Rooftop Unit Campaign.

American consumers increasingly expect the places they eat and shop to be environmentally responsible.¹⁷ More than half of customers favor eco-friendly restaurants, while more than 70% of Americans consider the environment when they shop.^{18, 19} Retail, food service, and grocery (RFSG) sector leaders are meeting these consumer demands—and saving millions of dollars per year—by finding new ways to slash energy use at the building level. In the past year, the RFSG sector helped address the following barriers:

- As building technologies advance and an older generation retires, it's getting harder to find qualified technicians to meet workforce needs, particularly for HVAC and refrigeration maintenance. An HVACR Workforce Resources list and HVACR Contracting Guide were developed to help RFSG partners and other sectors strengthen their in-house HVACR technician workforce or hire skilled contractors.

- Retail partners continue to face challenges with managing extensive amounts of data from energy management systems, so a targeted list of EMIS resources was compiled to assist partners with using that data to guide building-level improvements to save additional energy and money.



46
UNIQUE
SECTOR
PARTNERS

19
CHALLENGE
PARTNERS

27
ALLIANCE
PARTNERS

380 MILLION SQUARE FEET

\$130 MILLION SAVED SINCE 2011

Challenge Partners with Greatest Energy Savings

Savings Toward Initial Goal Since Baseline Year

University of California, Irvine*	29%
Chesapeake College*	24%
Towson University*	22%
University of Utah	19%
Allegheny College	18%
Sewanee: The University of the South	17%
Northwestern University	16%

*Goal achiever

Colleges and universities are pioneering new energy technologies, training tomorrow's workforce, and demonstrating a commitment to energy leadership by creating efficient, sustainable, and resilient campuses. Students are increasingly seeking out healthy, high-performing campuses,²⁰ which is a critical trend for higher education administrators as declining enrollments are driving increased competition for students and researchers.²¹ Institutions, in turn, are capitalizing on the many co-benefits of prioritizing campus efficiency. In the past year, partners in the Higher Education sector addressed the following priorities:

- ▶ Zero energy designs are increasing across the sector, extending to non-traditional building types such as laboratories, greenhouses, and workforce training centers. A collection of resources was developed to showcase these projects and offer guidance for others to follow.
- ▶ With more advanced and interactive building systems, there is a need to train technicians to operate them. Examples of developing skilled trade apprenticeship programs and engaging students in energy measurement and tracking have been highlighted to spread adoption of these successful workforce development initiatives.

Leadership in Action

- ▶ **Stanford University** saved \$450,000 by implementing energy information systems across 4.9 million square feet of student residence and dining facilities, enabling building managers to view and act on daily, monthly, and annual utility data.
- ▶ **Penn State** realized 20% energy savings and more than \$200,000 in annual cost savings after conducting comprehensive HVAC upgrades in their Computer Building's data center, including installing backdraft dampers on air conditioning units while isolating hot aisles from cold aisles.
- ▶ **UC Irvine** saved 50% on energy use at the Medical Sciences C laboratory by implementing comprehensive Smart Labs retrofits, including ventilation upgrades such as clustering exhaust stacks, dropping ceilings to reduce air volume, and installing LED lighting with controls for daylighting and occupancy.
- ▶ **University of Virginia** reduced energy costs by more than 60% and achieved 65% energy savings in historic Clark Hall through repairs to the energy recovery system, safe reductions to laboratory airflow rates, upgrades to control valves and air compressors, and tuning of air handling units.
- ▶ Campuses are continuing to prioritize the efficiency of their laboratories, which can consume three to four times the energy of a typical commercial building and account for up to 70% of a campus' energy footprint. The [Smart Labs Accelerator](#) collects and publishes best practices in laboratory energy efficiency, including monthly webinars on ultra-low temperature freezer management, ongoing recommissioning, and lab inhalation risk management assessments.



37
UNIQUE
SECTOR
PARTNERS

29
CHALLENGE
PARTNERS

12
ACCELERATOR
PARTNERS

240 MILLION SQUARE FEET

\$25 MILLION SAVED SINCE 2011

Challenge Partners with Greatest Energy Savings
Savings Toward Initial Goal Since Baseline Year

Xenia Community Schools, OH	23%
River Trails School District 26, IL*	23%
Bullitt County Public Schools, KY*	21%
Camas School District, WA*	19%
Parkway School District, MO	18%
Anne Arundel County Public Schools, MD	17%
Manchester School District, NH	17%
Fairfax County Public Schools, VA	16%
Madison City Schools, AL	15%
Poudre School District, CO*	14%
Aurora Public Schools, CO	13%

*Goal achiever

School districts use energy efficiency to enhance the learning environment for students and staff, improving occupant comfort while also reducing utility and associated maintenance costs. By improving energy efficiency, K-12 schools can save an estimated \$2 billion, equivalent to the cost of nearly 40 million new textbooks.²² Districts are renovating facilities and designing new buildings that incorporate clean energy sources, including zero energy features that reduce overall consumption and operating costs despite the challenges of growing student populations and limited budgets. In the past year, the K-12 sector helped address the following priorities:

- ▶ Lighting systems can positively impact student productivity and reduce absenteeism in the classroom. As more districts upgrade to new lighting technologies, the K-12 Lighting Toolkit offers comprehensive guidance and strategies for classroom optimization and proficiency.

Leadership in Action

- ▶ **Arlington County Public Schools, VA**, and **Horry County Schools, SC**, are demonstrating what’s possible in the K-12 sector by constructing multiple zero energy schools and sharing best practices and project cost analyses for comparison against regional construction averages.
- ▶ **Bullitt County Public Schools, KY**, reduced energy use by more than 30%, saving \$28,000 at Mt. Washington Elementary School by upgrading the lighting and HVAC systems, and improving the indoor air quality and learning environment for its students.
- ▶ **Los Angeles Unified School District, CA**, integrated zero energy education across their curriculum and is generating more than 20 MW of on-site solar energy, earning a Zero Net Energy School Leadership Award from the New Buildings Institute.
- ▶ **Aurora Public Schools, CO**, designed an incentive-based energy conservation program to build support for the district’s energy efficiency goals and recognize student engagement efforts, investing \$100,000 to date to help achieve a 13% energy savings across their building portfolio.
- ▶ Through a month-long student competition with ReNew Our Schools to demonstrate reductions in school energy use, students at **Poudre School District, CO**, contributed thousands of dollars in savings for the district.
- ▶ Many energy efficiency resources address the needs of urban and suburban school districts. Now, rural schools can explore ways to reduce energy consumption by leveraging Energy Efficiency and Renewable Energy Best Practices for Rural K-12 School Energy Managers and Educators.



30

UNIQUE
SECTOR
PARTNERS

8

CHALLENGE
PARTNERS

27

ACCELERATOR
PARTNERS

465 MILLION SQUARE FEET

\$258 MILLION SAVED SINCE 2011

Challenge Partners with Greatest Energy Savings

Savings Toward Initial Goal Since Baseline Year

State of Maryland*	27%
State of North Carolina*	16%
Commonwealth of Massachusetts	13%
State of Minnesota	10%

*Goal achiever

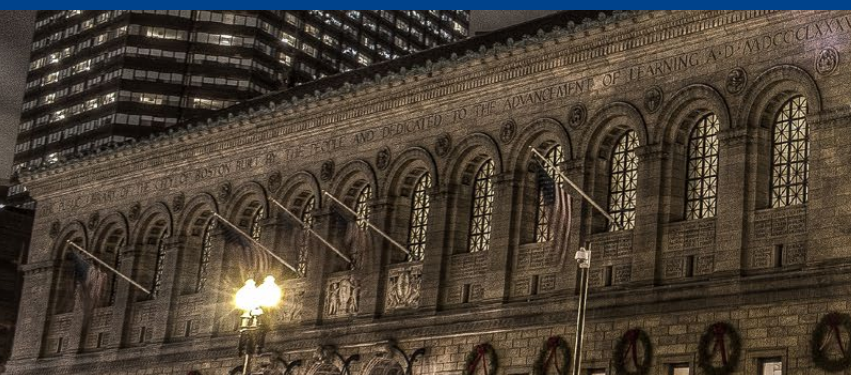
State governments continue their commitment to energy efficiency, with energy costs totaling \$11 billion annually, approximately 10% of their individual annual operating budgets.²³ By investing in energy savings performance contracting (ESPC), clean energy for low-income housing, and wastewater facilities, state governments can improve the reliability of their infrastructure and expand the impact of public funding. In the past year, state governments have engaged in the following areas:

- ▶ State governments can leverage ESPC to increase energy efficiency and upgrade infrastructure. The ESPC Guide for Small Projects helps states, municipalities, universities, schools, and hospitals (the MUSH market) address small projects in a cost-effective way. The ESPC MUSH Market Working Group promotes the importance of demonstrating verified savings in public buildings. The ESPC Online Community for state practitioners and MUSH market practitioners facilitate the sharing of proven practices and lessons learned.
- ▶ Many states are committed to the expansion of clean energy across all sectors, including low-income housing. The CELICA Toolkit provides an overview of key program development and design strategies explored by partners in the Accelerator, focusing on residential energy efficiency or renewable energy for low-income households, and improving energy affordability for those with high energy burdens.
- ▶ Responding to state interest in supporting efficiency in wastewater operations, the SWIFt Accelerator

Leadership in Action

- ▶ **The Michigan Agency for Energy** collaborated with a rural electric cooperative and community action agency to provide 50 low-income households with weatherization and community solar shares, which will contribute to a \$350 savings in annual energy costs per household.
- ▶ **Massachusetts** ranked number one on the American Council for an Energy Efficient Economy (ACEEE) State Energy Efficiency Scorecard for the eighth consecutive year, and continues to advance energy efficiency in new areas: The state committed \$220 million toward grid-side modernization technologies to improve utility efficiency and reliability, and prepare for smart meter deployment.
- ▶ **Illinois** is launching a solar workforce development program with a goal of creating jobs for 2,000 people from disadvantaged and low-income communities.
- ▶ **Colorado, Connecticut, and New York** are deploying nearly 45 MW of solar capacity to serve low- to moderate-income homes, as part of a broader commitment to help 155,000 low-income households access renewable energy benefits.
- ▶ **The California Energy Commission** is working to administer more than \$60 million for electric technology demonstration and deployment projects in disadvantaged communities throughout the state.
- ▶ **New Mexico** recently joined the Better Buildings Challenge, and is launching a \$32 million ESPC project in 2019.

continues to reduce the energy consumption of facilities across the country, with partners saving 12.3 million kWh to date, and reducing the amount of energy needed to treat one million gallons of water by 5.4%.



90

UNIQUE
SECTOR
PARTNERS

45

CHALLENGE
PARTNERS

44

COMMUNITIES
ALLIANCE PARTNERS

29

ACCELERATOR
PARTNERS

420 MILLION SQUARE FEET

\$348 MILLION SAVED SINCE 2011

Challenge Partners with Greatest Energy Savings

Savings Toward Initial Goal Since Baseline Year

Chattanooga, TN*	30%
Roanoke, VA*	23%
Atlanta, GA*	20%
Fort Lauderdale, FL	19%
Houston, TX	18%
Boston, MA	17%
Margate, FL	17%
Rochester, NY	16%
Knoxville, TN	14%
Columbia, MO	12%

*Goal achiever

Local governments are setting ambitious goals and taking action to modernize their own facilities and enhance community-wide sustainability and competitiveness. Local government buildings alone consume 2 quadrillion Btus each year, and have the potential to save \$3.7 billion annually through a 20% improvement.²⁴ In the past year, the local government sector helped address the following priorities:

- ▶ To increase data availability, local government partners launched 21 of the 28 local benchmarking and transparency programs nationwide in recent years, covering nearly 8 billion square feet. In 2019, DOE published a [resource guide](#) for developing and implementing a high-impact benchmarking and transparency program.
- ▶ To expand access to energy efficiency financing, 14 local governments joined with DOE in 2018 to launch a [Commercial Property Assessed Clean Energy \(C-PACE\) Working Group](#) that will stimulate an estimated \$60 million in C-PACE investments by 2022.

Leadership in Action

- ▶ **Hillsboro, OR**, and **West Palm Beach, FL**, have set new energy savings goals after achieving their initial Better Buildings Challenge goals.
- ▶ **Chicago, IL**, launched the Chicago Renewable Energy Challenge Program. Participants commit to developing or supporting renewable energy generation for 100% of building electricity needs by 2035.
- ▶ **Fort Lauderdale, FL**, developed a replicable [heat map tool](#) to visualize hourly energy usage data to determine efficiency opportunities and impacts.
- ▶ **Gary, IN**, partnered with a faith-based organization, a local utility, a community action agency, and several weatherization service providers to implement more than 3,000 energy efficiency retrofits to low-income homes in the city.
- ▶ **King County, WA**, retrofitted a complex of maintenance buildings to achieve net zero energy use as part of a broader commitment to launch 10 net zero projects by 2020.
- ▶ **Reno, NV**, passed a benchmarking and transparency ordinance in 2019, building on their local Better Buildings Initiative, ReEnergize Reno, which was launched in 2017.
- ▶ **Salt Lake City, UT**, achieved net zero energy use in its Public Safety Building after reducing energy use more than 30%—by optimizing efficient air handlers and radiant heating and cooling scheduling—and integrating on- and off-site solar power.
- ▶ **Will County, IL's**, new Sheriff's Department and Public Safety Complex is expected to save more than 1,000 MMBtus and \$16,000 annually. Its high-performance building envelope and design to maximize daylighting go beyond the Illinois energy code.



131

UNIQUE
SECTOR
PARTNERS

106

CHALLENGE
PARTNERS

29

ACCELERATOR
PARTNERS

620 MILLION SQUARE FEET (750,000 HOUSING UNITS)

\$49 MILLION SAVED SINCE 2009

8 OUT OF 10 TOP PUBLIC HOUSING AUTHORITIES

The U.S. Department of Housing and Urban Development (HUD) works with DOE to support multifamily partners. HUD provides technical and benchmarking assistance, and offers incentives for partners that participate in the Better Buildings Challenge.

Challenge Partners with Greatest Energy Savings

Savings Toward Initial Goal Since Baseline Year

Cambridge, MA, Housing Authority*	23%
Jersey City, NJ, Housing Authority*	23%
Tenderloin Neighborhood Development Corporation, San Francisco, CA*	21%
Caritas Communities, Inc., Braintree, MA	15%
Trinity Housing Corporation of Greeley, CO	15%
San Buenaventura, CA, Housing Authority	13%
Denver Housing Authority, CO	12%
Foundation Communities, Austin, TX	12%

*Goal achiever

Serving about a third of all households in the United States, the multifamily housing sector could save nearly \$3.4 billion in energy costs annually through energy efficiency improvements.²⁵ However, the sector faces challenges due to complex ownership structures, split utility bill payment responsibilities, and lack of capital for upfront costs. In response, governments and private sector stakeholders are developing innovative policies and tools to help jumpstart progress. Multifamily partners are working to address the following sector priorities:

- Multifamily Challenge partners have benefited from building performance data that are more broadly available nationwide, as 21 cities and counties and the State of California have adopted mandatory energy benchmarking policies for larger multifamily buildings. Nearly 70% of multifamily partners, representing more than 200,000 units are now benchmarking successfully, up from 14% in 2016.

Leadership in Action

- **Cambridge Housing Authority** and the **Tenderloin Neighborhood Development Corporation (TNDC)** achieved portfolio-wide energy savings of 23% and 21%, respectively, becoming Challenge goal achievers. TNDC also became a water goal achiever, having reached 21% water savings.
- **Eden Housing** transformed Camphora Apartments in Soledad, CA, from farm worker housing to a net zero, LEED® Platinum certified affordable housing property and community center for farm workers and families, investing more than \$20 million into a solar PV system, high-efficiency heating and hot water systems, ENERGY STAR® appliances, efficient water fixtures, and attic insulation.
- **The Community Builders** achieved Passive House certification of its new \$15 million Hillcrest Residences senior housing development in Pittsburgh, PA, with high-efficiency heat pumps, ERV units, airtight construction, heavy insulation, and triple-glazed windows.
- Graduates of Green City Force, an AmeriCorps program connecting **New York City Housing Authority (NYCHA)** youth with green-collar training and work experience, are helping to implement more than \$100 million in energy and water efficiency upgrades as part of NYCHA's Energy Performance Contract program.

- Resident health and well-being are important factors to consider when making energy efficiency upgrades. The Challenge is amplifying the activities of partners such as Codman Square and the East Bay Asian Local Development Corporation, which are joining forces with national healthcare leaders to implement low-cost, high-impact energy efficiency strategies to keep homes affordable and improve resident health.



120,000+ HOME ENERGY SCORES CONDUCTED SINCE 2012

80,000+ HOMES UPGRADED IN 2018 BY HOME PERFORMANCE WITH ENERGY STAR® SPONSORS

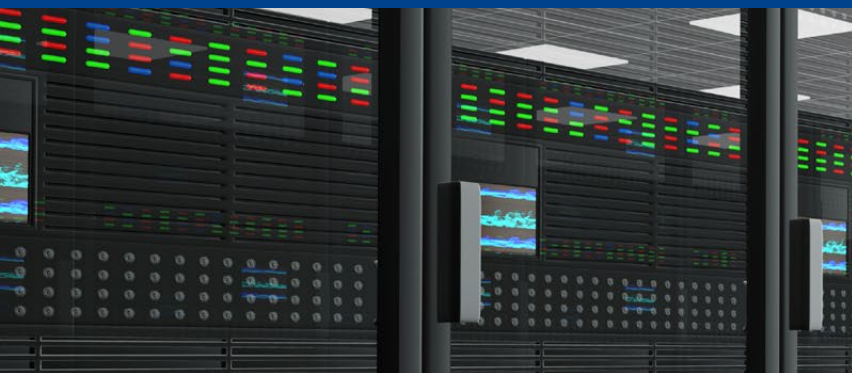
Residential buildings account for approximately 21% of total U.S. energy consumption,²⁶ and annual household energy bills amount to approximately \$1,850, on average.²⁷ Better Buildings partners are leaders in improving home energy efficiency with a variety of building upgrades and emerging technologies that also benefit occupant comfort and health. A key strategy that partners have embraced is increasing the availability of reliable information on a home's expected energy use at the time of sale. Through in-home assessments, Home Energy Score Assessors provide nationally standardized "miles per gallon" home scores that are useful to homeowners, homebuyers, and renters.

Partners in DOE's Zero Energy Ready Home program and the Solar Decathlon® continue to "push the envelope" on emerging technology and innovation. Twenty-seven homes from builders across the country were recognized this past year for driving technological advances and delivering American homebuyers a superior homeowner experience. The Solar Decathlon continues to motivate and equip the next generation workforce through a collegiate challenge to design and build highly efficient and innovative buildings powered by renewable energy. In 2020, Better Buildings partners will have the opportunity to work with a Solar Decathlon design team to develop a zero energy design.

More than 370 Better Buildings Residential Network members, including partners in DOE's Home Performance with ENERGY STAR® (HPwES) program, continue to make energy efficiency investments easier and improve the overall effectiveness of home energy upgrade programs. Many Network members, such as HPwES Sponsors, support consumers by connecting homeowners with qualified contractors who fix comfort problems and reduce energy bills. They also support the local workforce by providing training to contractors.

Leadership in Action

- ▶ The **Home Performance Coalition** and the **HPXML Working Group** worked with DOE to introduce new online tools for software developers, and an HPXML implementation guide to simplify data aggregation and analysis to lower contractor costs in home performance programs.
- ▶ Build It Green and Pacific Gas & Electric participated in the **Home Upgrade Program Accelerator** and were highlighted in a case study about streamlined process improvements to California's Home Energy Program that resulted in fewer errors and more reliable predicted energy savings.
- ▶ **Home Energy Information Accelerator** partners developed numerous home energy labeling resources, such as the Home Energy Labeling Guidebook via the Energy Metrics to Promote Residential Energy Scorecards in States (EMPRESS) initiative, and a home energy labeling program white paper to reach renters and other underserved housing markets.
- ▶ HPwES partners **Austin Energy** and **Energize Connecticut** expanded their program to include low- and moderate-income and multifamily residential programs
- ▶ The **Better Buildings Residential Network** raised the prominence of the health benefits of residential energy efficiency by running sessions at two groundbreaking conferences—the National Institutes of Health's first multi-agency Health in Buildings Conference and the inaugural ACEEE Health, Energy, and Environment Conference—and held multiple national webinars on the subject.



32
UNIQUE
SECTOR
PARTNERS

9
CHALLENGE
PARTNERS

23
ACCELERATOR
PARTNERS

570 MEGAWATTS OF ELECTRICITY DEMAND

\$23 MILLION SAVED SINCE 2011

Challenge Partners with Greatest Energy Savings
Savings Toward Initial Goal Since Baseline Year

Sabey Data Center Properties*	42%
Iron Mountain*	25%

*Goal achiever

With rising demand for cloud connectivity and data processing, energy consumption in data centers is expected to increase significantly. In 2020, it is forecasted that data centers will consume more than 73 billion kWh, representing about 1.8% of total U.S. electricity consumption.²⁸ However existing data center infrastructure has significant potential for energy efficiency savings—as high as 40%.²⁸ Particularly, smaller data centers remain an area of opportunity for energy efficiency reductions, consuming about 40 billion kWh per year.²⁸ Data center colocations, which lease server space, are a growing trend to help consolidate data center infrastructure, thus reducing costs and energy consumption. Better Buildings Data Center Challenge and Accelerator partners continue to demonstrate leadership by exploring emerging technologies, installing on-site renewable energy, and implementing green lease policies. Throughout the past year, the Data Center sector has helped advance the following priorities:

- ▶ Collaborating on best practices across the Federal, public, and private sectors through a series of meetings on air management, data center profiling tools, optimized environmental conditions, strategic consolidation, and ENERGY STAR® certification.
- ▶ Exploring emerging technologies and applications. Partners are working on efforts such as specifications for liquid cooling, installing a thermosiphon cooler hybrid system for water and energy savings, and powering a data center with a hydrogen fuel cell.

Leadership in Action

Six of nine Challenge partners are energy goal achievers, and have improved their infrastructure energy intensity by 34%, on average.

- ▶ **Sabey** continues to surpass its goal of 20% improvement by 2024, with realized energy savings of 42%. Sabey has achieved this through innovative leasing that required customers of its colocation data centers to implement hot aisle containment.
- ▶ **Michigan State University** has opened a new 25,000-square-foot data center in an effort to consolidate multiple data centers and server rooms across campus. This effort will save \$600,000 annually by utilizing indirect air-side economization cooling technology.
- ▶ **Digital Realty's** comprehensive sustainability program has helped them earn recognition as a Green Lease Leader; they are the first global data center real estate investment trust to adopt green lease standards for use in data centers.
- ▶ **Iron Mountain** implemented an underground geothermal cooling system at its Boyers, PA, data center. This project included the installation of geothermal pumps and heat exchangers to replace a conventional air-cooled chiller plant, allowing for both direct energy and cost savings, as well as indirect cost savings as a result of reduced operations and maintenance costs.
- ▶ Facilitating workforce development through the Data Center Energy Practitioner Training Program. The program helps partners better evaluate their energy status and identify low- and no-cost energy efficiency improvement opportunities in their data centers.

47

UNIQUE
SECTOR
ALLIES

\$3.38 BILLION FINANCED IN THE PAST YEAR

\$19 BILLION FINANCED SINCE 2012

Financial Allies with Most Capital Invested in 2018

Savings Toward Initial Goal Since Baseline Year

Hannon Armstrong*	\$1.16B
Citi*	\$472M
Bank of America Merrill Lynch*	\$431M
Ygrene Energy Fund*	\$365M
Bostonia	\$285M
Renew Financial*	\$188M
Connecticut Green Bank*	\$99M

*Goal achiever

Organizations are increasingly turning to third-party financing to support energy efficiency, renewable energy, and resiliency projects. According to the American Council for an Energy-Efficient Economy, hesitations about the upfront costs of energy upgrades may outweigh the positive perception of utility cost reductions, even when the financial returns are high.²⁹ By providing a range of financing options to cover these upfront costs, Better Buildings Financial Allies are helping to drive record amounts of capital into energy improvements while freeing up organizations to focus on their core missions. In the past year, the Financial Allies helped address the following barriers:

- Understanding the range of energy financing options remains a core challenge for organizations. Better Buildings Financing Navigator Version 2.0 was released to provide more sophisticated tools that help building owners explore the financing landscape, select a financing option, and connect directly with financing providers. New features include renewable energy financing options and more advanced tools to search, filter, and connect with specific Financial Allies.

Leadership in Action

- **Abundant Power Group** supported the financing of energy and water efficiency improvements for the Merchants National Bank Building redevelopment project, which will save nearly \$200,000 in annual utility costs.
- **Redaptive** partnered with AT&T to deploy energy efficiency upgrades at 650 facilities using an efficiency-as-a-service model, saving nearly \$20 million in energy costs.
- **Centrica Business Solutions** and **Connecticut Green Bank** joined forces to finance and install a microgrid system to reduce energy intensity and increase resilience for the City of Bridgeport, CT.
- Backed by \$115 million in commercial PACE assessments on 82 properties, **CleanFund** closed the largest securitization to date of commercial PACE assets by issuing a note for \$103 million in connection with the transaction.
- Each sector faces unique challenges and opportunities when seeking financing for energy projects. A suite of sector-specific financing primers was released, focusing on how public and private sector organizations can take advantage of both internal and external financing options.
- With many innovative financing options on the market, it can be challenging for organizations to stay on top of the latest trends. A toolkit focused on "efficiency as a service" was developed, with the goal of demystifying this fast-growing financing option and providing case studies from across the sectors.

The Federal Government is the single largest U.S. energy consumer, with more than 350,000 buildings and 600,000 vehicles. As such, the Federal Government has a significant opportunity and a responsibility to take the lead in cutting energy costs and advancing America’s progress toward energy independence, resilience, and security. In 2017, the Federal Government used 1.3 quadrillion Btus of primary energy at a cost of \$15.6 billion.³⁰ Energy used in buildings and facilities represents about 57% of the total energy use of the Federal Government, with vehicles and equipment energy use accounting for 43%.³⁰ Substantial opportunities exist for further energy cost reduction and conservation.

FEMP supports the Administration’s goal of energy dominance and implementation of Executive Order 13834, Efficient Federal Operations, by providing opportunities for more efficient, cost-effective, and secure energy usage and management in government facilities. FEMP’s efforts to assist agencies in facility management reduce costs, increase energy and water security, maintain and modernize infrastructure, and improve the health and safety of Federal employees.

New Tools and Resources

- ▶ FEMP enhanced the **eProject Builder Measuring and Verification (M&V) Module** to allow users to enter, review, and approve annual M&V data and create annual and cumulative reports as a new feature to the secure, web-based data management system for energy contracts.
- ▶ As a strategic approach to resilience planning, FEMP developed the **Technical Resilience Navigator** to provide an actionable, multifaceted approach for baselining conditions, assessing risks, prioritizing resources, executing plans, and validating performance.
- ▶ FEMP created the **How to Determine and Verify Operating and Maintenance Savings in Energy Savings Performance Contracts** document to provide guidance to Federal entities, municipalities, universities, schools, and hospitals on incorporating, documenting, and verifying energy-related operations and maintenance savings in energy savings performance contracts.

FEMP leverages Federal investment in support of mission readiness while collaborating across DOE Office of Energy Efficiency and Renewable Energy programs to enhance Federal investments to include resilience, system cybersecurity for facility-related control systems, reliability, and facility optimization.

FEMP by the Numbers

\$1.5 billion	Total Federal Investment in Facilities Infrastructure Energy Efficiency Government-Wide in FY2017
9,000 billion Btus (site-delivered)	Estimated Annual Energy Savings from FY2017 Investment
\$220 million	Estimated Annual Energy Cost Savings from FY2017 Investment
\$710 million	Efficiency Investment Awarded in FY2017 Under FEMP-Managed Performance Contracts (DOE indefinite-delivery, indefinite-quantity (IDIQ))

Leadership in Action

- ▶ FEMP supported the implementation of a 12 MW combined heat and power plant at **NASA’s Johnson Space Center (JSC)**, which generates 70% of the center’s electricity and reduces outage time at the site from 8.76 hours to 53 minutes per year, achieving JSC’s energy reduction goals through 2020.
- ▶ **Fort Carson** received technical assistance from FEMP for the installation of an 8.5 MW per hour battery storage system, the largest stand-alone battery on an Army post, which offsets the high-energy demands placed on Fort Carson’s power grid during the day and increases power grid resilience.
- ▶ FEMP partnered with the **U.S. Department of Homeland Security** to develop an Agency plan for Resilience Portfolio Planning to ensure mission readiness and facilitate the ability to plan for, adapt to, respond to, and recover from disruptions in power supply at the site level.
- ▶ Under the DOE IDIQ, **ESCO partners** invested a record \$809 million for FY2018 in ESPC projects to save 2 trillion Btus of energy annually.

Over the coming years, DOE will continue to work with leading organizations to respond to new challenges, needs, and opportunities in the market. Several of the key areas of focus over the coming years include:

Waste Reduction Pilot

Each year, the United States generates 2.7 billion tons of industrial solid waste and over 260 million tons of municipal solid waste.³¹ Manufacturers, companies, schools, and governments across the country are strengthening their competitiveness and sustainability by setting and realizing ambitious waste reduction goals. By reducing waste, these organizations also save energy. For example, in manufacturing plants, reducing manufacturing process wastes reduces the material and energy intensity of products which improves overall plant efficiency. More efficient use of materials and higher recycling rates in homes and buildings also reduce the amount of energy needed to transport and treat waste.

DOE recently launched the Waste Reduction Pilot to help partners reduce waste and improve energy performance. In the coming year, DOE will work with an initial group of partners to collectively set, track, and meet waste reduction goals. Lessons learned will inform how the pilot might be expanded to all partners in the future.

Developing a Skilled 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 with partners and a variety of national and regional stakeholders to address the need for more skilled workers. In addition to profiling the innovative solutions and strategies that partners are using to find and retain the best talent, DOE will be working to profile the opportunities available and the important nature of this work.

Planning for Resilience

The efficiency-resilience page was recently created on the Better Buildings Solution Center to help organizations across different sectors take steps to build resilience and increase their ability to bounce back from natural disasters and other stressors. DOE will continue to add new resources to those already available, which can be used to minimize vulnerabilities to climate-related impacts through resilience planning, implementing new energy technologies, and decreasing energy demand in facilities. There will also be opportunities for partners to engage with their peers to address related barriers at the annual Better Buildings Summit, and through the activities of the various Better Buildings sector teams.



COMMERCIAL

Abbott Northwestern Hospital
AKSAN United Fortune, Inc.*

Anthem, Inc.*

Arby's Restaurant Group, Inc.*

Army & Air Force Exchange Service

Ascension*

AtSite

Baptist Memorial Hospital Desoto

Beaumont Health System

Belk, Inc.

Berkshire Residential Investment

Best Buy*

BJ's Wholesale Club, Inc.

Bon Secours St. Francis
Health System

Boston Market

Briad Wenco*

Brixmor Property Group

Broward Health North

Calhoun Management*

Carlisle Corporation*

Catholic Health Initiatives

CBRE

CC Frost Properties, Ltd.

CEFCO Stores

CentraCare Health

Chipotle Mexican Grill

CKE Restaurants Holdings, Inc.*

Clarion Partners

Cleveland Clinic*

Coffee & Bagel Brands

Colliers International

Columbia Association*

CommonWealth Partners*

Community Services Agency

& Development Corporation

Costco Wholesale Corporation

Cox Enterprises

Crate & Barrel

Cushman and Wakefield

Dacra Development

DaVita

Delight Restaurant Group*

Denver West

Dunkin' Brands

DWS*

Equity One Inc.

First Potomac Realty Trust

Food Lion

Forest City Realty Trust

Gables Residential

Glenborough

Guam Memorial Hospital Authority

Gundersen Health System

H&M

Hackensack Meridian Health*

Hamra Enterprises*

Hannaford

Harris Teeter

The Hartford Financial Services Group, Inc.*

Havertys*

HAZA Foods

HealthSouth

HEI Hotels & Resorts

Hilton*

Hines

The Home Depot

Hoover Foods*

Hospital Corporation of America

Hyatt Hotels Corporation

IBM

IHG (InterContinental
Hotels Group)

Inova Health System

JAE Restaurant Group*

Jamestown*

JBG Smith*

JC Penney

Jones Lang LaSalle

Kaiser Permanente

Kelco Management & Development

Kessinger/Hunter & Co.

The Kessler Collection

Kilroy Realty

Kimco Realty Corporation

Kohl's Department Stores*

Lamey-Wellehan Shoes

LaSalle Investment Management

Las Vegas Sands Corporation*

LBA Realty*

Legacy Health

Lendlease*

Liberty Property Trust

Life Time Fitness*

Lincoln Harris

Living City Block

Loews Hotels & Co.*

Lowe's

Luxottica North America

Macy's*

The Malcolm Bryant Corp.

Marriott International

Mayo Clinic

McDonald's Corp.

MC Realty

Mesa Lane Partners, LLC

*MetLife Investment Advisors**

MGM Resorts International*

Montefiore Medical Center*

Mountain West Wendy's*

Neema Hospitality

Newmark Grubb Knight Frank

NewYork-Presbyterian Hospital*

Nike*

North Shore-Long Island

Jewish Health System

Nuveen Real Estate

(formerly TH Real Estate)

Oregon Health & Science University

Panda Restaurant Group, Inc.

Parkway Properties*

Parmenter Realty Partners*

Petco

PetSmart

PNC Financial Services Group*

Primary Aim, LLC*

Principal Real Estate Investors

Prologis*

Promar Corporation

Providence Health & Services

Prudential Financial, Inc.

Publix

Red Robin Gourmet Burgers

Regency Centers

Regions Bank

REI

Related Companies

Retail Properties of America

Ryan Companies US, Inc.

Safeway

Saunders Hotel Group*

Sears

Shari's Cafe & Pies*

Sharpe Properties Group, LLC

Shorenstein Properties LLC*

Siemens

Southwestern Vermont Health Care

Sprint***Staples***

Starbucks Coffee Company*

Stream Realty Partners, L.P.

Studley

Summa Health System

Suncoast Credit Union*

SUPERVALU

Tar Heel Capital*

Target

TH Real Estate (TIAA)*

Tishman Speyer

The Tower Companies*

Transwestern

Ultra Beauty

U.S. Navy CNIC Facilities
and Acquisitions

U.S. Space and Rocket Center

USAA Real Estate Company*

University of Maryland
Medical Center*University of Nebraska
Medical Center*University of Pittsburgh Medical Center
(UPMC)*University of South Alabama
Medical Center

University of Utah Health Care

UW Health*

Vornado

Walgreens Co.*

Walmart*

The Walt Disney Co.

Washington REIT*

Wawa

Weis Markets

Welltower

Wen-GAP, LLC

Wend-Rockies Inc.*

Wendco Group*

Wendium of Florida, Inc.*

The Wendy's Company*

WenMarr Management
Company, LLC.

Westchester Medical Center

The Westfield Group

Whole Foods Market*

Wyndham Destinations*

Yum! Brands

DATA CENTERS

CenturyLink, Inc.*

Digital Realty Trust***eBay Inc.***

Intel*

Intuit***Iron Mountain Data Centers*****Sabey Data Center Properties***

Virtustream

Waste Management**EDUCATION**

Adams 12 - Five Star Schools, CO

Alachua County Public Schools, FL*

Albuquerque Public Schools, NM*

Alexandria City Public Schools, VA*

Allegheny College*

Amity School District, CT

Anne Arundel County
Public Schools, MD*

Arizona State University

Arlington County School District, VA

Aurora Public Schools, CO*

Bard College*

Boulder Valley School District, CO

Bullitt County Public Schools, KY***Camas School District, WA*****Chesapeake College***

Clark Atlanta University

Colorado School of Mines

Community College of
Allegheny County*

Cornell University

Delaware State University*

Douglas County School District, CO

Douglas County School District, NV*

Duke University

Dysart Unified School
District 89, AZ*

Emory University

Evergreen Public Schools, WA*

Fairfax County Public Schools, VA*

Florida A&M*

Fort Atkinson School District, WI*

Garnet Valley School District, PA*

Georgia Institute of Technology

Grand Valley State University

Hackensack University
Medical Center*Hermosa Beach City School
District, CA

Hillsboro School District, OR*

Horry County Schools, SC

Houston Independent
School District, TX*

Huntsville City Schools, AL*

Indiana University

Indianapolis Public Schools, IN*

Kansas City Public Schools, MO*

Los Angeles Unified School
District, CA*

Loyola University

Madison City Schools, AL*

Manchester School District, NH*

Massachusetts Institute of Technology

Mesa County Valley School
District, CO*

Michigan State University*

Northwestern University*

Parkway School District, MO*

Penn State University*

Portland Public School District, OR*

Portland State University

Poudre School District, CO*

Ramapo College

River Trails School District 26, IL**San Francisco Unified School District**San Mateo Community
College District

School District of Philadelphia, PA

Sewanee: The University
of the South*

Stanford University

Stevens Institute of Technology*

Towson University*

Tulane University

Tulsa Public Schools, OK*

University of California, Berkeley*

University of California, Davis

University of California, Irvine*

University of California, Merced

KEY

- ▶ Partners with names in **bold** are energy, water, or Accelerator goal achievers
- ▶ Partners with a * have taken the Better Buildings Challenge
- ▶ Partners with names in *italics* are new to Better Buildings

University of Colorado Boulder
 University of Hawaii at Manoa*
 University of Illinois, Chicago
 University of Iowa
 University of Maryland
 University of Massachusetts
 Medical School
 University of Miami
 University of Minnesota
 University of New Hampshire
 University of South Carolina
 University of Utah*
 University of Virginia*
 University of Wisconsin
 Washington College*
 Washington University in St. Louis*
 Washtenaw Community College
 Wesleyan University
 Xenia Community Schools, OH*

FEDERAL

Argonne National Laboratory
 Defense Health Agency
 Environmental Molecular
 Sciences Laboratory
 Lawrence Berkeley
 National Laboratory
 Lawrence Livermore
 National Laboratory
 Los Alamos National Laboratory
 National Energy Research
 Scientific Computing Center
 National Renewable
 Energy Laboratory
 Oak Ridge National Laboratory
 Pacific Northwest National Laboratory
 U.S. Department of Agriculture -
 Edward T. Schafer Agricultural
 Research Center
 U.S. Department of Defense - Defense
 Information Systems Agency
 U.S. Department of Justice -
 Drug Enforcement Agency
 U.S. Department of Veterans Affairs
 U.S. Environmental
 Protection Agency
 U.S. General Services Administration -
 Federal Drug Administration Bothell
 Laboratory
 U.S. National Aeronautics
 and Space Administration -
 Armstrong Flight Research Center

U.S. National Aeronautics
 and Space Administration -
 Jet Propulsion Laboratory
 U.S. Social Security Administration
 Veterans Health Administration

FINANCIAL ALLIES

Abundant Power Group*
 Advantage Energy Capital
 Partners, LLC*
**AFL-CIO Housing
 Investment Trust***
 All American Investment Group*
 Allumia*
Bank of America Merrill Lynch*
BioStar Renewables*
 Blue Hill Partners LLC*
 BlueFlame Energy Finance*
 Bostonia Partners LLC*
 Byline Financial Group*
 California Housing Partnership*
 CBJ Energy*
 Centrica Business Solutions*
Citi*
CleanFund LLC*
 Commercial Power Partners, LLC*
Community Investment Corporation*
Connecticut Green Bank*
EDF Renewable Energy*
Energi*
Enterprise Community Partners*
 Flywheel*
 Greenworks Lending*
Hannon Armstrong*
*The Hartford Steam Boiler Inspection
 and Insurance Co.**
*Hawaii Green Infrastructure Authority**
*Lever Energy Capital**
LISC*
 Low Income Investment Fund*
Metrus Energy*
**New York City Energy
 Efficiency Corporation***
 Onsite Utility Services Capital*
PACE Equity*
 Petros PACE Finance LLC*
Redaptive*
*Renew Energy Partners**
Renew Financial*
 Samas Capital*

*Skyview Ventures**
Sol Systems*
 Southeast Capital & Finance*
Sparkfund*
 Structured Finance Associates, LLC*
 Triple Bottom Line (TBL) Foundation*
 Urban Ingenuity*
Ygrene Energy Fund*

INDUSTRIAL

3M*
 AbbVie Inc.
 Agropur
 Alcoa*
 Alexandria Renew Enterprises
 Amcor
 American Mitsuba
 ArcelorMittal USA
 Armstrong Flooring, Inc.
 Asama Coldwater Manufacturing
 AstraZeneca
AT&T
Avon Lake Regional Water
 Ball Corporation
 BD*
Bentley Mills*
 Bosch Rexroth
**BPM, Inc. (Badger Paper
 Mills, Inc.)**
Bradken
 Bridgestone Americas, Inc.
 Briggs & Stratton*
 Bristol-Myers Squibb
 Buck Company
**Bucks County Water
 & Sewer Authority***
 California Portland Cement Company
 (d.b.a. CalPortland)
 Campbell Soup
Cardington Yutaka Technologies*
 Carlton Forge Works
 Cascade Engineering
 Technologies, Inc.
Celanese International Corporation*
**C. F. Martin & Co., Inc.
 (Martin Guitar)***
 Chapco Inc.
 Charter Steel
 Chippewa Valley Ethanol Company

Citrus World, Inc. (formerly Florida's Natural Growers)
 City of Charleston, SC, Water System
 City of Grand Rapids Water Resource Reclamation Facility*
 City of Phoenix Water Services Department
 City of Roseville, Environmental Utilities Department
 Clearwater Engineering
 Coilplus Inc.
Comau Inc.
 Commercial Metals Company
 Co-Operative Industries Aerospace & Defense
 Cooper Standard
Cummins, Inc.*
Daikin Applied Americas, Inc.
 Darigold*
 Delta Diablo
 Denison Industries
 Des Moines Water Works*
Deschutes Brewery
 Didion Milling
 Dixline Corporation
 Donsco Inc.
 Dow Chemical
 DSM North America
Durable Products
 Durex Inc.
 Earth2O (d.b.a. The Sweetwater Company Inc.)
 Eastman Chemical Company*
Eaton Electric
 Eck Industries
 Electrolux*
Encina Wastewater Authority*
Estée Lauder
Expera Specialty Solutions (Thilmany Mill)
Fiat Chrysler Automobiles
 Flambeau River Papers
Flowers Foods
 FMC Corporation
 Ford Motor Company*
GB Manufacturing
 General Aluminum Manufacturing Company
General Dynamics Ordnance and Tactical Systems

General Electric*
General Mills*
General Motors*
 General Stamping & Metalworks
 GKN Aerospace Services Structures
 Golden Renewable Energy, LLC
 Goodyear Tire & Rubber Company
Graham Packaging
Graphic Packaging International, Inc.
HARBEC*
 Harley-Davidson Motor Company
 Harrison Steel Castings Co.
 Harva Company
 Haynes International
 HNI Corporation / Allsteel
 Honda
 Huntsman Corporation
Imerys Carbonates North America
Ingersoll Rand*
Ingevity
 Intel
 International Paper Company
 Intertape Polymer Group
Intralox LLC
 Ithaca Area Water Wastewater Treatment Agency*
 JBT Corporation
 Jedco, Inc.
Johnson Controls*
Johnson & Johnson
Johnson Matthey
 J.R. Simplot*
 Kent County Levy Court
 Kenworth Truck Company
Kingspan Insulated Panels, Inc.
Krage Manufacturing
 KYB Americas Corporation
Lafarge-Holcim*
 Land O'Lakes
Leggett & Platt, Incorporated
Legrand*
Lennox International*
 Lineage Logistics
Lockheed Martin
 L'Oréal*
Los Angeles Bureau of Sanitation
 Los Angeles Department of Water and Power*
 Lynam Industries Inc.

Magnetic Metals Corp.
 MAHLE Engine Components USA
 Manitowoc Grey Iron Foundry
 Mannington Mills
 Marquis Energy
 Marquis Energy Wisconsin
 Massachusetts Water Resources Authority
 MB Aerospace East Granby
 McCain Foods USA, Inc.
Metal Industries, Inc.
Michels Corporation
Mitsubishi Electric Automotive America
 Mohawk Industries
 Mulgrew Aircraft Components, Inc.
 Narragansett Bay Commission
 Navistar International Corporation
 Neenah Foundry
 NEW Water (Green Bay Metropolitan Sewerage District)*
 Newman Technology
Nissan North America*
 Novati Technologies
 Novelis
 NSK Americas
 NYC DEP - Bureau of Wastewater Treatment
 O'Fallon Casting
 OFD Foods
 OMNOVA Solutions Inc.
 Orange Water and Sewer Authority*
 Oshkosh Corporation
Osram Sylvania
Owens Corning
Ozinga Bros.
 Pactiv
 Paperworks Industries
 Parker Hannifin
Patrick Cudahy
Patriot Foundry & Castings
 PepsiCo

KEY

- ▶ Partners with names in **bold** are energy, water, or Accelerator goal achievers
- ▶ Partners with a ***** have taken the Better Buildings Challenge
- ▶ Partners with names in *italics* are new to Better Buildings

Pharmavite*
 Philadelphia Water Department
 Pima County Regional Wastewater
 Reclamation Department
 Plastics Engineering
 Company (Plenco)
 PPC Broadband
 PPG
Procter & Gamble
 Quad/Graphics, Inc.
 Raytheon
 Research Electro-Optics
 Richmond Industries Inc.
Roche Diagnostics Operations
 Rowley Spring and Stamping
 Saint-Gobain Corporation*
 Savage Precision Fabrication
Schneider Electric*
 Selmet, Inc.
 Shape Corporation
Shaw Industries
 Sheboygan Regional Wastewater
 Treatment Facility
Sherwin Williams
 Solberg Manufacturing Inc.*
 Sony DADC
 Spirax Sarco, Inc.
 Stanley Spring and Stamping
 Steelcase, Inc.
 St. Petersburg Water
 Resources Department
 SunOpta, Inc.
TE Connectivity*
 Tenaris
Texas Instruments
 Texas Nameplate Co.
 Textron, Inc.
ThyssenKrupp Elevators
 TitanX Engine Cooling, Inc.
**Toyota Motor Engineering
 & Manufacturing North
 America, Inc.***
 TPC Group LLC
 Tri-State Plastics, Inc.
 Tyson Foods
 United Mechanical and Metal
 Fabricators (U-MEC)
United Technologies Corporation*
 Vanguard Space Technologies
 Vermeer

Verso Corporation
**Victor Valley Wastewater
 Reclamation Authority***
Volvo Group North America*
 W. L. Gore and Associates
 Waupaca Foundry
 Weber Metals Inc.
 Western Lake Superior
 Sanitary District
 Westrock
Weyerhaeuser
 Whirlpool Corporation
 Xerox*
 Zimmer Biomet

MULTIFAMILY

2LifeCommunities*
 ACTION-Housing Inc.*
 Aeon*
 AHEAD, Inc.*
 Angola Housing Authority*
 Atlanta Housing Authority*
 Avon Park Housing Authority*
 Balfour Beatty Communities*
 Beacon Communities*
 Boston Housing Authority*
 The Boston Land Company*
 Bozzuto Management Company*
 BRIDGE Housing Corporation*
Cambridge, MA, Housing Authority*
 Capitol Hill Housing*
 Caritas Communities, Inc.*
 Cascap, Inc.*
 Century Housing*
 Christian Church Homes*
 Cion Housing Services*
 The City of Hickory Public
 Housing Authority*
 Cleveland Housing Authority*
 Codman Square Neighborhood
 Development Corporation*
 CommonBond Communities*
 The Community Builders, Inc.*
 Community Housing Partners*
 Consecra Housing Network*
 Corcoran Management*
 Cuyahoga Metropolitan
 Housing Authority*
 Danville Development*
 EAH Housing, Inc.*

East Bay Asian Local
 Development Corporation*
 The Economic Development Authority
 of the City of Mankato, MN*
 Eden Housing*
 Elderly Housing Development and
 Operations Corporation*
 Essex Management Company, LLC*
 The Evangelical Lutheran
 Good Samaritan Society*
 Fort Wayne Housing Authority*
 Foundation Communities*
 FS Energy*
 Gary Housing Authority*
 Gateway Management
 Services, LLC*
 Green Coast Enterprises*
 H.J. Russell & Company*
 Highland Commercial Properties*
 Homes for America*
 Housing Authority of Baltimore City*
 Housing Authority of the City of
 Bristol, CT*
 The Housing Authority of the City and
 County of Denver*
 Housing Authority of the City of
 Freeport, IL*
 Housing Authority of the City of
 Helena, MT*
 Housing Authority of the City of
 Palatka, FL*
 Housing Authority of the City of
 Philadelphia, PA*
 Housing Authority of the City of
 San Buenaventura, CA*
 Housing Authority of
 Knox County, IN*
 Housing Trust of Rutland County, VT*
 Houston Housing Authority*
 Jamaica Plain Neighborhood
 Development Corporation*
**Jersey City, NJ,
 Housing Authority***
**Jewish Community Housing
 for the Elderly***
 Jonathan Rose Companies*
Keene Housing*
 Kier Property Management*
 King County Housing Authority*
 Korman Residential Properties, Inc.*
 LINC Housing Corporation*

Lucas Metropolitan
Housing Authority*

Manhattan Housing Authority*

McCormack Baron Salazar*

Mercy Housing, Inc.*

Michigan City Housing Authority*

Minneapolis Public
Housing Authority*

Multi-Family Mission Ministries*

National Church Residences*

New Bedford Housing Authority*

New York City Housing Authority*

Newark Housing Authority*

NewLife Homes*

NHP Foundation*

NHT/Enterprise Preservation
Corporation*

Peabody Properties, Inc.*

Presby's Inspired Life*

Preservation of Affordable Housing*

Puerto Rico Public Housing
Administration*

REACH CDC*

The Renaissance Collaborative*

Retirement Housing Foundation*

Rockford Housing Authority*

Rural Ulster Preservation Company*

San Antonio Housing Authority*

Satellite Affordable Housing
Associates*

Schochet Companies*

The Silver Street Group
and Housing Management
Resources, Inc.*

Stark Metropolitan
Housing Authority*

Stewards of Affordable Housing
for the Future

Tampa Housing Authority*

**Tenderloin Neighborhood
Development Corporation***

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*

Volunteers of America

Washington, DC,
Housing Authority*

Wesley Housing Corporation*

Windsor Locks Housing Authority*

WinnCompanies*

Wishrock Investment Group*

Yolo County, CA, Housing Authority*

STATE & LOCAL

Alabama

Albany, NY

Anchorage, AK

Arlington County, VA*

Arvada, CO*

Atlanta, GA*

Austin, TX

Beaverton, OR*

Boston, MA*

Boulder, CO

Boulder County, CO

Broward County, FL

California

Cambridge, MA

Chattanooga, TN*

Chicago, IL*

Chula Vista, CA*

Cincinnati, OH

Clark County, NV*

Cleveland, OH*

Columbia, MO*

Columbus, OH

Commonwealth of Pennsylvania

Colorado

Connecticut

Cook County, IL*

Dearborn, MI

Deerfield Beach, FL

Delaware*

Delaware Valley Regional Planning Commission

Denver, CO*

Des Moines, IA

Detroit, MI

District of Columbia*

Dubuque, IA

El Paso, TX*

Evanston, IL

Flint, MI

Florida

Fort Lauderdale, FL*

Fort Worth, TX*

The Fresno Energy
Performance District

Gary, IN

Gillette, WY*

Greater Lawrence Sanitary District

Hall County, GA*

Hawaii

Hawkeye Area Community
Action Agency

Hillsboro, OR*

Hoboken, NJ

Holland, MI

Houston, TX*

Huntington, NY*

Huntington Beach, CA

Illinois

Indiana

Iowa

Kansas

Kansas City, MO

Kauai County, HI*

King County, WA*

Knoxville, TN*

Knoxville Utilities Board

Little Rock, AR

Local Government Commission

Los Angeles, CA*

Los Angeles County, CA

Margate, FL*

Maryland*

Massachusetts*

Medford, MA*

Miami-Dade County, FL

Michigan

Milwaukee, WI*

Minneapolis, MN

Minnesota*

Missouri

Montana

Montgomery County, MD

KEY

- ▶ Partners with names in **bold** are energy, water, or Accelerator goal achievers
- ▶ Partners with a * have taken the Better Buildings Challenge
- ▶ Partners with names in *italics* are new to Better Buildings

Montpelier, VT
 Nevada
 New Hampshire
*New Mexico, GSD Capital Region**
 New Orleans, LA
 New York*

New York, NY

Newark, NJ

North Carolina*

North Dakota
 Northeast Ohio Regional
 Sewer District
 Oakland, CA
 Oklahoma
 Oregon
 Orlando, FL*

Perry, IA
 Philadelphia, PA*

Phoenix, AZ
 Pittsburgh, PA*

Placer County, CA*

Portland, ME

Portland, OR
 Racine, WI
 Reno, NV*

Rhode Island*

Richmond, VA
 Rhode Island Infrastructure Bank

Roanoke, VA*

Rochester, NY*

Saint Paul, MN
 Salt Lake City, UT*

San Diego, CA*

San Francisco, CA
 Santa Fe, NM*

Santa Monica, CA
 Seattle, WA*

Sonoma County, CA

South Carolina

Southeast Michigan
 Regional Energy Office
 Southern California
 Regional Energy Network
 St. Petersburg, FL

Takoma Park, MD

Tallahassee, FL
 Tennessee
 Texas
 Thurston County, WA*

Toledo, OH*

Utah
 Virgin Islands Energy Office

Virginia

Washington

Washington State Transportation
 Improvement Board

West Palm Beach, FL*

West Virginia
 West Virginia Rural Water Association
 Will County, IL*

Wisconsin
 Worcester, MA*

UTILITY

AEP Ohio
 Arizona Public Service
 Atlanta Gas Light
 Austin Energy
 Baltimore Gas & Electric

Bonneville Power Administration

California Energy Commission
 Commonwealth Edison
Consolidated Edison

Efficiency Vermont

Eversource
 Focus on Energy
 Kansas City Power & Light
 Long Island Power Authority
 NSTAR/Northeastern
 National Grid
 Nicor Gas
 One Gas
 Orlando Utilities Commission
 Pacific Gas and Electric Company
 PECO
 Pennsylvania PUC
Peoples Natural Gas
 Pepco
Philadelphia Gas Works
 PSEG Long Island
 Puget Sound Energy
 Questar Gas
 Reliant/NRG
 Rocky Mountain Power
 San Diego Gas & Electric
 Southern California Edison
 Southern California Gas
 TECO
 Xcel Energy

PROGRAM AFFILIATES

2G Energy Inc.
Aegis Energy Services
 Alliance to Save Energy
 American Council for an
 Energy-Efficient Economy
 American Hotel & Lodging Association
 American Institute of Architects
 American Planning Association
 American Society for
 Healthcare Engineering
 American Society for Heating,
 Refrigerating, and Air-Conditioning
 Engineers
 APPA - Leadership in
 Educational Facilities
 Appraisal Institute
 Arup
 Asian American Hotel
 Owners Association
 Association for Learning Environments
 Association for the Advancement of
 Sustainability in Higher Education
 Association of Energy Affordability
 Biomass Thermal Energy Council
 BlocPower
 Build It Green
 Building Owners and Managers
 Association International
 Building Performance Institute
 The Bullitt Foundation
 C40
 California Regional Multiple
 Listing Service
 California Street Light Association
Capstone Turbine Corporation
Caterpillar Inc.
 Center for REALTOR® Technology
 City Zenith
 Clean Energy States Alliance
 Commercial Real Estate Data Alliance
 Community Action Partnership
 of Oregon
 Community Action Program
 of Evansville and
 Vanderburgh Counties
 Connex
 Consortium for Building
 Energy Innovation
 CoreLogic
 Couleecap Inc.

Council of Multiple Listing Services
 Denver National Western Center
 Earth Advantage
 EcoDistricts
 Ecolibrium3
 Edison Electric Institute
 EEtility
 Elevate Energy
 Emerald Cities Collaborative
 Energize Connecticut
 The Energy Coalition
 Energy Efficiency for All/NRDC
 Energy Foundation
 Energy Outreach Colorado
 Enhabit
 Environmental Defense Fund
 Ford Twin Cities Assembly Plant
 Redevelopment Project
 Garfield Clean Energy Collaborative
GE Distributed Power
GEM Energy LLC
 Global Cool Cities Alliance
 Google
 Governing Institute
 Green Building Alliance
 Green Button Alliance
 Green Parking Council
 Green Sports Alliance
 GRID Alternatives
 Groundswell
 Hatch
 Health Care Without Harm
 Home Innovation Research Labs
 Home Performance Coalition
 Homes.com
 ICLEI
 Illuminating Engineering Society
 of North America
 Institute for Market Transformation
 Institute for Sustainable Communities
 International City/County Management
 Association
 International District
 Energy Association
 International Facility
 Management Association
 IRES MLS
Kraft Power Corporation
 Kresge Foundation
MacAllister Power Systems

Martin Energy Group
 Metropolitan Regional
 Information Systems
 Mid-America Regional Council
 Midwest Energy Efficiency Alliance
 Midwest Real Estate Data
 NACUBO
 NAIOP (Commercial Real Estate
 Development Association)
 National Apartment Association
 National Association of Convenience
 Stores
 National Association of Counties
 National Association of Real Estate
 Investment Trusts
 National Association of
 REALTORS®
 National Association of
 Regional Councils
 National Association of
 State Energy Officials
 National Co-op Grocers
 National Energy Education
 Development Project
 National League of Cities
 National Multifamily
 Housing Council
 NeighborWorks of Western Vermont
 New Buildings Institute
New Jersey Clean Energy Program
(TRC Solutions)
North American Sustainable
Refrigeration Council
 Northeast Energy Efficiency
 Partnerships
Northeast-Western Energy Systems
 NYSERDA
 Opportunity Council
 Pearl National Certification
Pension Real Estate Association
 Philips Lighting
 PicketFence.com
 Posigen
 Practice Greenhealth
 Public Technology Institute
 The Real Estate Round Table
 Real Estate Standards Organization
 Realtors Property Resource, LLC
 Regional MLS
 Renewable Energy
 Transition Initiative
 Retail Industry Leaders Association

Rocky Mountain Institute
 Roof Coatings
 Manufacturers Association
 Second Nature
 Slipstream
 Smart Cities Council
 Smart Energy Decisions
 The Solar Foundation
 Spire Inc.
 STAR Communities
Sterling & Wilson Cogen Solutions, LLC
Stewart and Stevenson Power Product
LLC, Atlantic Division
 Sun Valley EcoDistrict
 Surdna Foundation
 Sustainability Roundtable Inc.
 Sustainable Endowments Institute
 Telecommunication Industry
 Association
 Tennessee Valley Authority
 Thermal Energy Corporation
 U.S. Green Building Council
 Unified Foodservice
 Purchasing Co-op, LLC
Unison Energy, LLC
 United Illuminating
Urban Land Institute
 Urban Sustainability
 Directors Network
 Vermont Energy Investment
 Corporation
 Vizient Vote Solar
 Water Environment Federation
 Western New York
 Manufacturing ZNE District

KEY

- ▶ Partners with names in **bold** are energy, water, or Accelerator goal achievers
- ▶ Partners with a * have taken the Better Buildings Challenge
- ▶ Partners with names in *italics* are new to Better Buildings

1. U.S. Energy Information Administration (EIA). 2011. Annual Energy Outlook 2011. [https://www.eia.gov/outlooks/aeo/pdf/0383\(2011\).pdf](https://www.eia.gov/outlooks/aeo/pdf/0383(2011).pdf) Calculations based on total energy use and utility rates for commercial and industrial properties.
2. Nadel, et al. 2015. Energy Efficiency in the United States: 35 Years and Counting. <https://aceee.org/sites/default/files/publications/researchreports/e1502.pdf>
3. U.S. Department of Energy (DOE). 2016. Building Technologies Office Multi-Year Program Plan. https://www.energy.gov/sites/prod/files/2016/02/f29/BTO_MYPP_2016.pdf
4. Spencer, et al. 2019. *Floating PV: Assessing the Technical Potential of Photovoltaic Systems on Man-Made Water Bodies in the Continental U.S.* Environmental Science & Technology, 53, 3, 1680-1689.
5. Certified HVAC Installers achieve a 10% efficiency over non-certified installers (Strategic Plan to Reduce the Energy Impact of Air Conditioners (California Energy Commission Staff Report); Worker Certification Ensures High-Quality Maintenance Work (Energy Market Innovations, Inc.); Certified Electrician can reduce efficiency of space by as much as 25% (California Advanced Lighting Controls Trend Analysis Report).
6. U.S. Environmental Protection Agency (EPA). 2018. Sustainable Water Infrastructure. <https://www.epa.gov/sustainable-water-infrastructure/energy-efficiency-water-utilities>
7. U.S. Environmental Protection Agency (EPA). 2018. Sustainable Water Infrastructure. <https://www.epa.gov/sustainable-water-infrastructure/energy-efficiency-water-utilities>
8. Facility Executive. 2018. Energy Improvements Across the Board. <https://facilityexecutive.com/2018/06/energy-improvements-across-the-board/>
9. Retrofit. 2019. Historic Airport Terminal Realizes Massive Savings from Deep Energy Retrofit. <https://www.retrofitmagazine.com/historic-airport-terminal-realizes-massive-savings-from-deep-energy-retrofit/>
10. Healthcare Facilities Today. 2018. Training, efficiency and cost savings: Fostering the next generation of facilities professionals. <https://www.healthcarefacilitiestoday.com/posts/Training-efficiency-and-cost-savings-Fostering-the-next-generation-of-facilities-professionals--19160>
11. Go Green Radio. 2019. L.A. Unified School District Recognized by U.S. Dept. of Energy. <https://www.voiceamerica.com/show/episode/114166>
12. Bureau of Labor Statistics. 2019. Industries at a Glance: Manufacturing. <https://www.bls.gov/iag/tgs/iag31-33.htm#workforce>
13. National Association of Manufacturers (NAM). nd. Manufacturing's Commitment to Sustainability. http://documents.nam.org/ERP/ERP_Sustainability_Snapshot_10-2018.pdf
14. U.S. Energy Information Administration (EIA). 2016. 2012 Commercial Buildings Energy Consumption Survey: Energy Usage Summary. <https://www.eia.gov/consumption/commercial/reports/2012/energyusage/>
15. U.S. Environmental Protection Agency (EPA). nd. Healthcare: An Overview of Energy Use and Energy Efficiency Opportunities. ENERGY STAR. <https://www.energystar.gov/ia/partners/publications/pubdocs/Healthcare.pdf>
16. Booking.com. 2017. Sustainable Travel Report. <https://news.booking.com/bookingcoms-2017-sustainable-travel-report/>
17. Cone Communications LLC. 2017. 2017 Cone Communications CSR Study. <http://www.conecomm.com/research-blog/2017-csr-study>
18. National Restaurant Association. 2018. The State of Restaurant Sustainability. <https://restaurant.org/research/reports/state-of-restaurant-sustainability>
19. Cone Communications LLC. 2013. Green Gap Trend Tracker. <http://www.conecomm.com/2013-cone-communications-green-gap-trend-tracker>
20. O'Reilly, K. 2018. *The Top 20 Coolest Schools 2018.* Sierra Club. <https://www.sierraclub.org/sierra/cool-schools-2018/top-20-coolest-schools-2018>
21. Sightlines. 2018. 2018 State of Facilities in Higher Education. http://18ux851sis0c8g7t8vm4d0dd-wpengine.netdna-ssl.com/wp-content/uploads/2019/01/2018-State-of-Facilities-in-Higher-Education_updated-1.3.19.pdf
22. U.S. Environmental Protection Agency (EPA). 2011. Energy Efficiency Program in K-12 Schools. A Guide to Developing and Implementing Greenhouse Gas Reduction Programs. https://www.epa.gov/sites/production/files/2015-08/documents/k-12_guide.pdf
23. American Council for an Energy Efficient Economy (ACEEE). 2018. The State Current: States Lead by Example. <https://aceee.org/blog/2009/07/state-current-states-lead-example>
24. U.S. Energy Information Administration (EIA). 2016. 2012 Commercial Buildings Energy Consumption Survey, Table C1. <https://www.eia.gov/consumption/commercial/data/2012/c&e/cfm/c1.php>
25. American Council for an Energy Efficient Economy (ACEEE). 2016. The Multifamily Energy Savings Project. <https://aceee.org/multifamily-project>
26. U.S. Energy Information Administration (EIA). 2015. Residential Energy Consumption Survey, Table CE1.1. <https://www.eia.gov/consumption/residential/data/2015/c&e/pdf/ce1.1.pdf>
27. U.S. Energy Information Administration, 2015. Residential Energy Consumption Survey, Table CE1.1 Summary annual household site consumption and expenditures in the U.S.—totals and intensities, 2015. <https://www.eia.gov/consumption/residential/data/2015/c&e/pdf/ce1.1.pdf>
28. Shehabi, et al. 2016. *United States Data Center Energy Usage Report.* Lawrence Berkeley National Laboratory. http://eta-publications.lbl.gov/sites/default/files/lbnl-1005775_v2.pdf
29. Nadel, S. 2017. *Who Invests in Energy Efficiency and Why?* American Council for an Energy-Efficient Economy. <https://aceee.org/blog/2017/07/who-invests-energy-efficiency-and-why>
30. U.S. Department of Energy (DOE). nd. About the Federal Energy Management Program. <https://www.energy.gov/eere/femp/about-federal-energy-management-program>
31. U.S. Environmental Protection Agency (EPA). 2018. National Overview: Facts and Figures on Materials, Wastes and Recycling. <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials>

