



Stepping Up to the Challenge Together

PROGRESS REPORT 2022

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Partners in the Better Buildings Initiative are making strategic decisions that prioritize energy efficiency and greenhouse gas emissions reductions. By working together to share proven solutions and innovative ideas, we are accelerating our progress to a zero carbon future and strengthening the U.S. economy.”

Jennifer M. Granholm

Secretary, U.S. Department of Energy

The U.S. Department of Energy’s (DOE) Better Buildings Initiative is a market transformation program through which partners collaboratively pursue ambitious energy, waste, water, and greenhouse gas (GHG) reduction goals. They share their real-world pathways for achieving significant savings in their buildings, industrial facilities, and multifamily homes. In doing so, they inspire others, demonstrate strategies to overcome common barriers, and catalyze significant progress in energy efficiency and decarbonization. The leadership of Better Buildings Initiative partners strengthens our economy, advances energy independence, and propels us forward to a clean energy future.

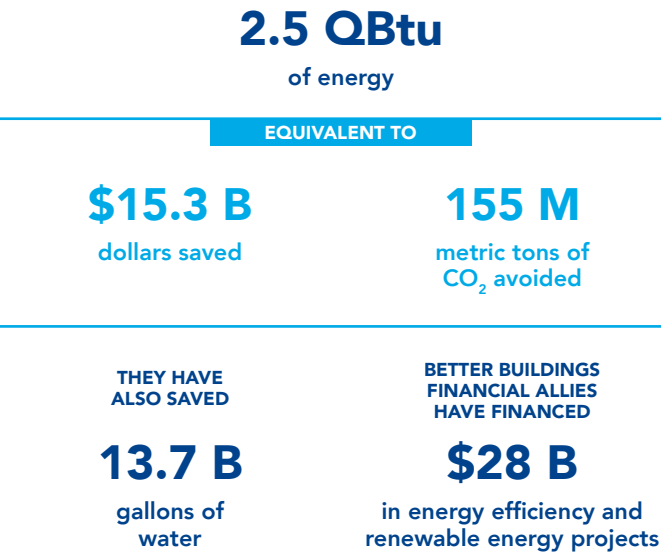
The more than 900 program partners represent more than 35 of the country’s Fortune 100 companies, more than 10 of the top 25 U.S. employers, 14% of the U.S. manufacturing energy footprint, and 13% of total commercial building space, as well as more than 100 state and local governments spanning the nation.

In the past year, Better Buildings Initiative partners:

- **Advanced Decarbonization.** More than 130 unique organizations have joined DOE’s Better Climate Challenge and Low Carbon Pilot programs. They are paving the way for others by accelerating energy efficiency, investing in low carbon technologies and retrofits, and reporting on their progress. DOE is providing technical assistance, facilitating peer-to-peer learning opportunities, and highlighting real-world, replicable solutions.
- **Collaborated to Drive Technological Innovation.** Through Better Buildings, partners joined working groups with peers and experts from DOE’s National Laboratories and elsewhere to discuss barriers, exchange best practices, and identify technical, organizational, and financial approaches that work across different building and plant types. This collaboration fosters a diverse network and advances the adoption of new technologies and strategies.
- **Contributed Solutions to Benefit Others.** Partners shared their approaches for achieving significant energy, water, and waste reductions across their portfolios of buildings and plants. They also began increasingly to share their pathways for decarbonizing their operations.

Making an Impact

Since the start of the Better Buildings Initiative, partners have collectively saved:



Highlighting Solutions

DOE’s Better Buildings Solution Center is the place to find proven and cost-effective decarbonization, energy, water, and waste efficiency solutions. There are more than 3,000 solutions categorized by barrier, building type, sector, technology, and more. Many of the latest Solution Center resources are highlighted throughout the pages of this report. These include:

- Low Carbon Technology Strategies Toolkit11
- Decarbonization Download video blogs.....12
- Technology Research Team resources.....14
- Design and construction resources.....14
- Waste-to-energy calculator15
- Water-efficiency resources.....16
- Carbon financing resources.....38

Announcing the Better Climate Challenge

100+ organizations have joined the Better Climate Challenge.

This national public-private partnership calls on organizations across the country to set bold, portfolio-wide greenhouse gas emissions reduction targets and share their innovative solutions across industries. DOE will drive progress towards these commitments by providing technical assistance and convening peer exchanges that support pathways to decarbonization, while elevating energy efficiency and prioritizing clean energy solutions.

Partnership programs like the Better Climate Challenge are key to reaching President Biden’s goal of a net zero emissions economy by 2050 through an equitable clean energy transition. If all organizations in the commercial, public, multifamily, and industrial sectors reduced their U.S. greenhouse gas emissions by 50%, it would save nearly **1.5 billion metric tons of CO₂e annually**,¹ more than the annual emissions from every home in the country.



Jennifer M. Granholm
Secretary
U.S. Department of Energy

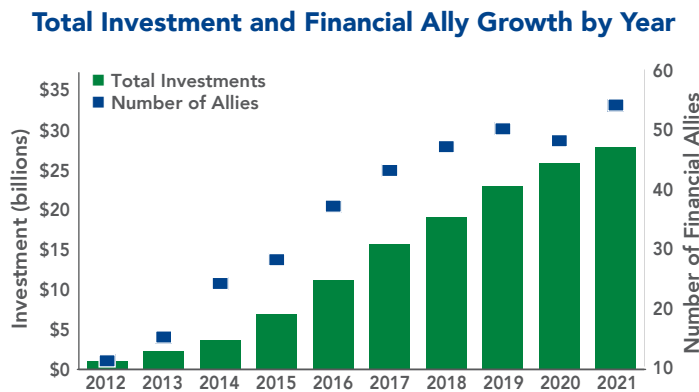
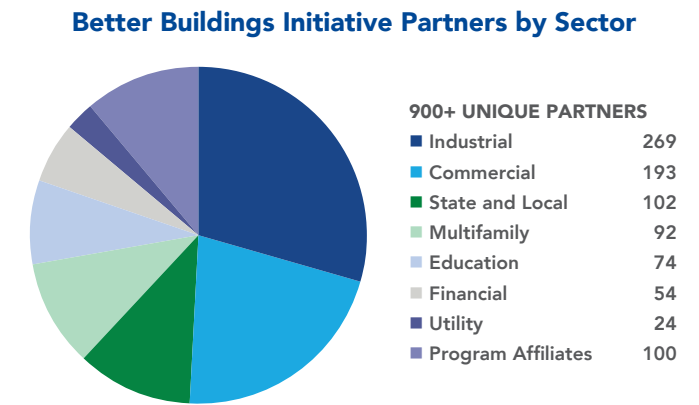
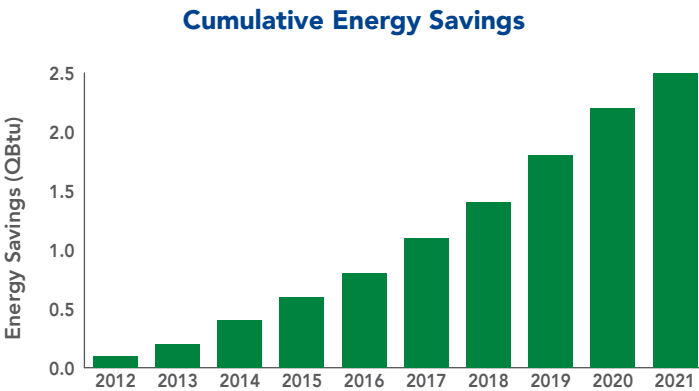


Marcia L. Fudge
Secretary
U.S. Department of Housing and Urban Development



Gina McCarthy
White House National Climate Advisor

More than 900 organizations participate in the **Better Buildings Initiative**, representing market leaders in nearly every sector. These organizations include state and local governments that provide critical services, school districts that educate the nation's students, and more than one-third of the Fortune 100 companies that provide millions of jobs and fuel economic growth.

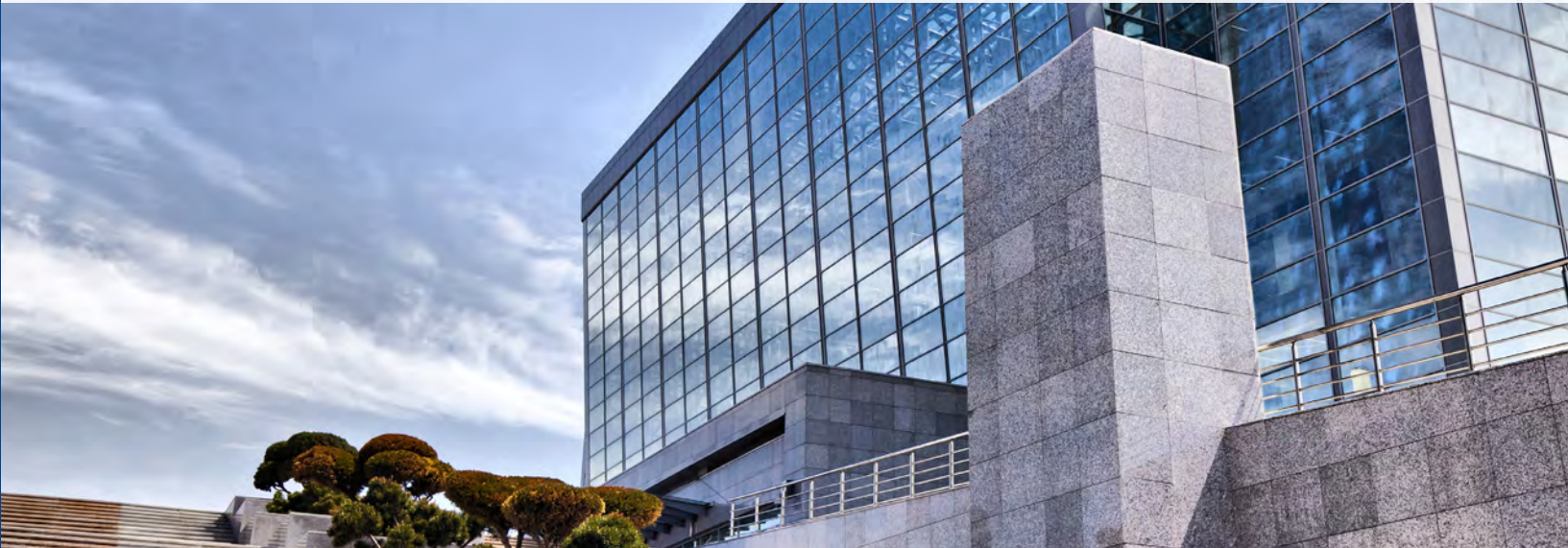


Overall Results to Date

- ENERGY SAVED**
2.5 Quadrillion Btu
- DOLLARS SAVED**
\$15.3 Billion
- SQUARE FEET**
13.2 Billion
- INDUSTRIAL FACILITIES**
3,500
- AVOIDED CO₂ EMISSIONS**
155 Million Metric Tons
- WATER SAVED (GALLONS)**
13.7 Billion
- FUNDING EXTENDED BY FINANCIAL ALLIES**
\$28 Billion
- PARTNER SOLUTIONS AVAILABLE ONLINE**
3,000+
- ENERGY PERFORMANCE DATA TRACKED**
40,000+ Properties
- HOME ENERGY SCORES™**
180,000+

Setting Goals and Achieving Results

- ▶ More than 345 organizations have set portfolio-wide energy reduction goals through the **Better Buildings Challenge**, and more than 90 partners have met one or more of those goals.
- ▶ More than 270 **Better Plants industrial partners** located in all 50 states have reported 1.9 QBtu in energy savings and more than \$9 billion in cost savings to date.
- ▶ **Better Buildings Financial Allies** extended more than \$28 billion for energy efficiency and renewable energy projects since the start of the program.
- ▶ More than 100 partners joined the new **Better Climate Challenge**, setting ambitious GHG emissions reduction goals and committing to share replicable pathways to decarbonization.



900+
UNIQUE
PARTNERS

Partners by Program:

- 345+**
WITH AN ENERGY GOAL
- 100+**
WITH A CLIMATE GOAL
- 50+**
WITH A FINANCING GOAL

270+
BETTER PLANTS PARTNERS

110+
BETTER BUILDINGS
ACCELERATOR PARTNERS (active)

190+
BETTER BUILDINGS ALLIANCE
PARTNERS AND AFFILIATES

Market Leadership

- ▶ More than **90 Challenge** partners have met an energy goal since the start of the program, **13** have met a water goal, and **27** Financial Allies have met a financing goal.
- ▶ In the past year, program partners have contributed to **more than 100** resources on the Better Buildings Solution Center and helped to deliver **more than 85 webinars**.
- ▶ Better Climate Challenge commercial, public, and multifamily partners represent **more than 1.1 billion square feet** of building space, and industrial partners represent **more than 1,750** industrial facilities.



Better Information

- ▶ **250,000 unique visitors** explored resources on the Better Buildings Solution Center in 2021 and spent **nearly 20% more time on the site** on average than the year before.
- ▶ More than **5,000 attendees** joined the Better Buildings Webinar Series in the past year and another **4,000 attended** the 2021 virtual Better Buildings, Better Plants Summit.
- ▶ The Better Plants Online Learning Series provided guidance on a range of new topics including energy intensity baselining and tracking, as well as understanding electric, natural gas, and water bills.

DOE's Challenge partners lead the way by setting ambitious, portfolio-wide goals and sharing their proven approaches with the marketplace:

NEW

BETTER CLIMATE CHALLENGE

GOAL:
At least 50% GHG emissions reduction over 10 years

BETTER BUILDINGS CHALLENGE

GOAL:
At least 20% energy intensity reduction within 10 years

BETTER PLANTS CHALLENGE

GOAL:
At least 25% energy intensity reduction within 10 years



Additional Better Buildings Initiative partnership opportunities include the following:

- ▶ Better Plants Program
- ▶ Better Buildings Accelerators
- ▶ Low Carbon Pilot
- ▶ Better Buildings Alliance
- ▶ Better Climate Challenge Allies
- ▶ Better Buildings Residential Network
- ▶ Industrial Energy Management Workforce
- ▶ High-Impact Technology Field Validations
- ▶ Technology Teams and Campaigns
- ▶ Home Energy Score™

Innovation and Emerging Technologies

- ▶ Integrated Lighting Campaign participants reported saving approximately **4 million kWh** through the implementation of **advanced lighting systems**.
- ▶ Building Envelope Campaign participants reported saving approximately **9 million kBtu** based on **envelope technologies** alone.
- ▶ The Industrial Technology Validation (ITV) Pilot entered Phase 2 to test innovative and emerging decarbonization technologies in real-world industrial environments and catalyze widespread adoption across the market.



Workforce Development

- ▶ More than **500 attendees** joined Better Plants Virtual In-Plant Trainings in the past year, identifying over **\$4 million** in potential energy savings.
- ▶ The Better Buildings Workforce Accelerator provided nearly **100 trainings** attended by more than **38,000 participants** in its first year.
- ▶ The **Workforce Development Portal** on the Better Buildings Solution Center provides job seekers with practical resources to help them pursue an impactful career in energy efficiency.

ENERGY GOAL ACHIEVERS



LIFE TIME, INC.

38%

Chanhasen, MN
16.2 M sq. ft. committed
2014 baseline



WHOLE FOODS MARKET

21%

Austin, TX
12.3 M sq. ft. committed
2010 baseline



BULLITT COUNTY PUBLIC SCHOOLS, KY

35%

Shepherdsville, KY
2 M sq. ft. committed
2013 baseline



FORT WORTH INDEPENDENT SCHOOL DISTRICT

20%

Fort Worth, TX
13.5 M sq. ft. committed
2016 baseline



KNOXVILLE, TN

26%

3.2 M sq. ft. committed
2010 baseline



MINNEAPOLIS PUBLIC HOUSING AUTHORITY

20%

Minneapolis, MN
3.4 M sq. ft. committed
2013 baseline



WILL COUNTY, IL

23%

1.1 M sq. ft. committed
2009 baseline



LEGRAND NORTH AND CENTRAL AMERICA

14%

West Hartford, CT
19 facilities
2016 baseline



JAMAICA PLAINS NEIGHBORHOOD DEVELOPMENT

22%

Boston, MA
380,000 sq. ft. committed
2014 baseline



DISTRICT OF COLUMBIA HOUSING AUTHORITY

21%

Washington, D.C.
5.7 M sq. ft. committed
2011 baseline



THE WENDY'S COMPANY

25%

Dublin, OH
1.25 M sq. ft. committed
2018 baseline

DOE recognizes Better Buildings, Better Plants partners through site visits, social media, and news stories. Celebrating partner achievements accelerates the adoption of their solutions.

In the past year:

500+ PARTNER MENTIONS ON SOCIAL MEDIA

100+ NEWS ARTICLES FEATURING PARTNERS



Better Buildings
@BetterBldgsDOE



#ICYMI! Last month @SecGranholm & @SecFudge visited #BetterBuildingsChallenge multifamily partner @NHTCommunities' Vintage Gardens, one of the first grant recipients of @HUDgov's Green Retrofit Program. Catch up on the visit: <http://ow.ly/rg9550HuZBY>











Better Buildings
@BetterBldgsDOE



Your plant may require compressed air, but it doesn't have to be inefficient! Check out @BetterPlantsDOE partner @GM's Showcase Project to see how they improved compressed air system performance to help them move towards decarbonization goals: <http://ow.ly/zqrQ50HmhRT>











Better Buildings
@BetterBldgsDOE



Want #efficiency upgrades specific to your property's stage in the real estate lifecycle? Check out this Case Study from @CBRE to learn how it used an Integrated Systems Package (ISP) tailored to tenant-fit-out to achieve 25% annual #energy & GHG savings: <http://ow.ly/cz6W50H0A7t>









Seeing Progress in Person

In March 2022, DOE Principal Deputy Assistant Secretary of Energy Efficiency and Renewable Energy Kelly Speakes-Backman and **Jamestown** staff toured Levi's Plaza in San Francisco, CA to recognize electrification projects as part of Jamestown's commitment to decarbonize building energy use across its national portfolio. In April 2021, Jamestown announced plans to achieve net zero energy by 2025 at Levi's Plaza through energy efficiency, electrification retrofits, and renewable energy.



Partners in the Headlines

WJZ-TV 13 – CBS BALTIMORE
Maryland Joins Federal Program Pledging to Reduce State Government's Greenhouse Gases by 50%

" 'Maryland has joined the U.S. Department of Energy's Better Climate Challenge, pledging to reduce greenhouse gas emissions from state government operations by at least 50% within 10 years,' Gov. Larry Hogan said."

AP NEWS
Cleveland-Cliffs Partners with U.S. Department of Energy through Better Climate Challenge Initiative

" Cleveland-Cliffs Inc. has entered into a partnership with the U.S. Department of Energy (DOE) as part of the Better Climate Challenge initiative, a new government-sponsored effort challenging organizations to set ambitious, portfolio-wide GHG emission reduction goals."

Through Better Buildings, DOE has increased its support for organizations pursuing decarbonization at the building and portfolio levels by providing technical assistance to Low Carbon Pilot participants and launching the Better Climate Challenge.



Low Carbon Pilot

DOE is working with 65 partners through the Low Carbon Pilot to explore facility-level pathways for reducing emissions from building and manufacturing operations and share these approaches with the market. Partners connect with DOE National Laboratory staff to identify and overcome barriers to decarbonization.

HIGHLIGHTS:

- ▶ Pilot participants are developing facility-level decarbonization action templates to demonstrate how they are achieving real-world emissions reductions.
- ▶ More than 10 peer exchange sessions were held connecting partners with industry experts on heat pumps, green bonds, renewable energy and natural gas, resilience, hydrogen, and electrification.

Better Climate Challenge

DOE launched the Better Climate Challenge to encourage organizations to set ambitious, portfolio-wide GHG emissions reduction goals. Partners pledge to reduce scope 1 and 2 GHG emissions across their U.S. building or plant portfolio by at least 50% over 10 years without the use of offsets, while also pursuing a bold energy efficiency target. Better Climate Challenge Allies help recruit and support partners and share solutions.

If all organizations in the commercial, public, and industrial sectors reduced their U.S. greenhouse gas emissions by 50%, it would save nearly **1.5 billion metric tons of CO₂e annually**,¹ more than the annual emissions from every home in the U.S.



PARTNERS:

- 3M
- Albany County, NY
- Anthem, Inc.
- Arizona Housing, Inc.
- AVANGRID
- Bard College
- Bendix Commercial Vehicle Systems
- BorgWarner Inc.
- Brewery Vivant
- BXP
- California State University, Sacramento
- The Chemours Company
- Chula Vista, CA
- Cleveland-Cliffs Inc.
- Cleveland Clinic Foundation
- Colorado State University
- Columbia Association
- Community Housing Partners
- Cummins Inc.
- Dallas, TX
- DaVita
- Deschutes Brewery
- DSM North America
- Eastman Chemical Company
- Electrolux Home Products – North America
- Empire State Realty Trust
- Exelon Corporation
- Fairfax County, VA
- Ford Motor Company
- Foundation Communities
- General Electric (GE)
- General Motors
- Glens Falls, NY

- Grand Rapids Water Resource Recovery Facility
- Harley-Davidson Motor Company
- Hewlett Packard Enterprise
- Hillsboro, OR
- Hilton
- HNI Corporation
- Homeowner's Rehab Inc.
- Honeywell
- IKEA Retail U.S.
- Ingersoll Rand
- International Paper
- Jamestown
- Johnson Controls
- King County Housing Authority
- Kingspan Insulated Panels, Inc.
- Knoxville, TN
- Kohl's, Inc.
- KYB Americas Corporation
- La Crosse, WI
- LaSalle Investment Management
- Lear Corporation
- Legacy Vacation Resorts
- Legrand North and Central America
- Lendlease
- Link Logistics
- Lopez-Dorada Foods
- Los Angeles Department of Water and Power
- Los Angeles Unified School District
- Louisville, KY
- Lundberg Family Farms
- Madison, WI
- State of Maryland

- MetLife Investment Management
- MGM Resorts International
- Miami-Dade Water and Sewer Department
- Mitsubishi Electric Automotive America
- Montour Falls, NY
- Nestlé
- Nissan North America
- Orlando, FL
- Pace University
- Paramount Pictures
- Philadelphia, PA
- QTS Data Centers
- River Trails School District 26, IL
- Roanoke, VA
- Sabey Data Centers
- Saint-Gobain Corporation
- San Diego, CA
- Schneider Electric
- Schochet Companies
- Seattle Housing Authority
- Siemens
- Southampton, NY
- Standard Communities
- Stanley Black & Decker
- Steelcase Inc.
- Stryker
- Synthomer
- Tarkett USA Inc.
- Tenderloin Neighborhood Development Corporation
- The Tower Companies
- Toyota Motor North America, Inc.
- Trane Technologies
- United Mechanical and Metal Fabricators Inc.

- University of Chicago
- University of Michigan
- University of Virginia
- UW Health
- Volvo Group North America
- Waupaca Foundry, Inc.
- Whirlpool Corporation
- Worcester, MA
- Xerox Corporation
- Zebra Technologies Corporation

ALLIES:

- American Hotel & Lodging Association
- American Society for Healthcare Engineering
- APPA – Leadership in Educational Facilities
- Association for the Advancement of Sustainability in Higher Education
- Association of Energy Engineers
- Building Owners & Managers Association International
- ConnexFM
- Elevate Energy
- ICLEI: Local Governments for Sustainability
- International Facility Management Association
- North American Sustainable Refrigeration Council
- The Real Estate Roundtable
- Rewiring America
- Second Nature
- Stewards of Affordable Housing for the Future
- Urban Land Institute
- U.S. Green Building Council

The Better Buildings Solution Center is home to more than 3,000 proven and cost-effective decarbonization, energy, water, and waste efficiency solutions, many of which have been contributed by program partners. Nearly 250,000 people visited the Solution Center in 2021 with over 720,000 page views.

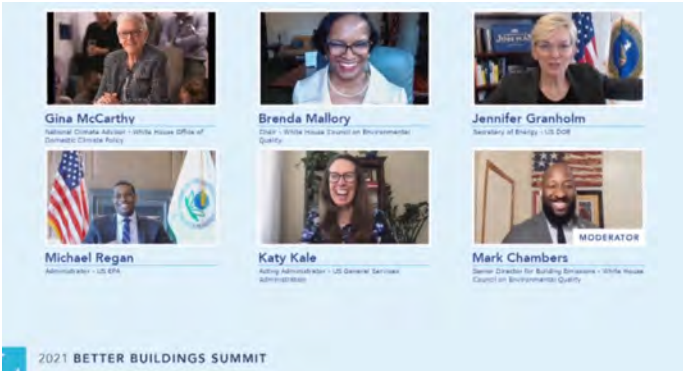
Visit the [Solution Center](#) to:

- ▶ Access technical tools and toolkits to advance decarbonization and increase energy, water, and waste reductions.
- ▶ Identify and secure financing for decarbonization and efficiency projects.
- ▶ Attend and explore webinars on challenges facing energy professionals, with experts leading the conversations on best practices, cost-effective strategies, and innovative approaches.
- ▶ Learn about peer exchange opportunities like the Water Savings and Waste Reduction networks, and how to become a Better Buildings partner.

Connecting Virtually

ACCELERATING BUILDING DECARBONIZATION:
A WHITE HOUSE ROUNDTABLE WITH
GOVERNMENT AND INDUSTRY

At the 2021 Better Buildings, Better Plants Summit, White House and Cabinet representatives from three agencies came together to announce new initiatives and talk with industry stakeholders about decarbonization, jobs, and new technologies.



3,000+
UNIQUE SOLUTIONS

IN THE PAST YEAR

NEW SOLUTIONS
100+

NEW WEBINARS
85+

New on the Solution Center

LOW CARBON TECHNOLOGY STRATEGIES TOOLKIT

This toolkit provides guidance for planning retrofit and operational strategies to achieve deep carbon reductions. Strategies are currently available for 10 building types, grouped by technology and complexity.

DECARBONIZATION RESOURCE HUB

Explore the new Decarbonization Resource Hub to find resources on decarbonization basics, prioritizing energy efficiency, setting goals and tracking progress, leveraging renewables, utilizing emerging technologies, engaging stakeholders, and finding carbon financing.

Decarbonization Download

This video blog series highlights the important work of DOE's partners who share takeaways, best practices, and actionable steps to reduce carbon emissions in buildings and plants.



5-minute conversations between partners and DOE leadership exploring:

- ▶ Why is decarbonization important to your organization?
- ▶ Who are your stakeholders, and do they care about decarbonization?
- ▶ What projects are you excited about?
- ▶ What challenges do you see in reducing carbon emissions?
- ▶ What would you say to other organizations considering this work?

5 QUESTIONS WITH...

PRESERVATION OF AFFORDABLE HOUSING (POAH)

Julie Klump of POAH, a multifamily housing partner, outlines how to harness passive housing design to cut carbon and increase resilience in multifamily buildings.

GUNDENSEN HEALTH SYSTEM

Tim Wilson of Gundersen Health System discusses a model for achieving increased resilience and energy independence through on-site generation. Hear about these strategies and others to cut costs in healthcare facilities.

STEELCASE

Steelcase's Mary Ellen Mika demonstrates the outsized impact on carbon reduction that simple upgrades can have. Learn how tackling low-hanging fruit in energy efficiency can cut costs while reducing carbon emissions from operations and supply chains.

CITY OF ORLANDO

Ian Lahiff of the City of Orlando lays out strategies for the partnerships and collaboration that will help to maximize energy savings and cut carbon emissions with minimal roadblocks.

ZEBRA TECHNOLOGIES

Mani Balakrishnan of Zebra Technologies shares three tips to maximize carbon reduction and outlines how science-based targets can help your organization cut carbon emissions now.

BARD COLLEGE

Bard College's Taun Toay shows how to harness new technologies to decarbonize historic infrastructure and shares why he remains hopeful in the face of the climate crisis.

Collaboration is a core component of the Better Buildings program. Partners join working groups with their peers and technical experts to discuss barriers and exchange best practices. This focus on collaboration fosters a diverse network that benefits all participants.

Accelerators

Better Buildings Accelerators are targeted, short-term, partner-focused efforts to address persistent barriers to efficiency and other improvements. The goal of each Accelerator is to speed up investment in energy efficiency by demonstrating what’s possible and how through the development of toolkits, case studies, and market research. Nearly 20 Accelerators have been launched to date; visit the Accelerator landing page on the Solution Center to learn more.

The active Accelerators are:

Packaged Combined Heat and Power (CHP) Accelerator

DOE’s CHP Deployment Program works with partners to validate a 20% or more reduction in installation times and total project costs for recognized, pre-engineered packaged CHP systems. In the past year, roadmaps to incorporate packaged CHP were updated for more than 15 partners. Partners have also participated in the DOE Packaged CHP eCatalog to provide performance specifications for their systems, with more than 40 CHP Packagers and 25 Solution Providers joining the eCatalog over the past two years.

Sustainable Corrections Infrastructure Partnership (SCIP) Accelerator

SCIP partners are working through the building blocks of energy management and planning to achieve portfolio-wide energy savings of 20% and create replicable solutions that reinforce energy resilience in the corrections sector. DOE is working with 17 partners, including 16 states and one county, representing almost 30% of state correctional facilities. Partners are evaluating energy and water conservation measures, renewable energy and storage technologies, and financing models to plan infrastructure improvements across their facilities. SCIP created a ‘50001 Ready’ cohort to help correctional facilities implement strategic energy management systems on their campuses.

Sustainable Wastewater Infrastructure (SWIFt) Accelerator 2.0

SWIFt engages wastewater treatment facilities (WWTFs) in a voluntary partnership to achieve 5% short-term and 25% long-term facility-wide energy savings, learn about financing opportunities for infrastructure upgrades, and implement advanced energy upgrades (e.g., energy efficiency, renewable energy, resource recovery, and advanced data management). SWIFt has more than 60 signatory partners that represent more than 155 wastewater facilities across 34 states. SWIFt also launched the first-ever ‘50001 Ready’ cohort tailored to help WWTFs implement strategic energy management systems on their campuses.

Workforce Accelerator

Accelerator partners are working to increase interest in building energy efficiency careers, improve curricula, and streamline career pathways. During the first year of the Accelerator, partners hosted nearly 100 trainings to more than 38,000 participants and reached over 400,000 people with information about green building careers. The Accelerator team hosted workshops on reaching K-12 students and increasing workforce diversity, equity, and inclusion. It also matched eight partners to technical assistance providers who helped map curricula, determined skills gaps in existing programs, and aligned skills training to certifications.

Advancing Together through Peer Networking

Better Buildings peer networking occurs through:

- ▶ Accelerator peer exchanges
- ▶ Technology Team meetings and Technology Campaign activities
- ▶ Low Carbon Pilot working groups
- ▶ Waste Reduction Network peer exchanges
- ▶ Water Savings Network peer exchanges
- ▶ Sector peer exchanges

Technology Campaigns

Technology Campaigns aim to accelerate the adoption of efficient building technologies by providing technical assistance, resources, and guidance on implementation best practices.

- ▶ Building Envelope Campaign: Launched in 2020 to help improve the performance of building envelopes in both new and existing buildings, the campaign introduced a new envelope assessment tool and Building Envelope Performance (BEP) metric. In 2021, 14 participants were recognized for high performing building envelopes.
- ▶ Integrated Lighting Campaign: Launched in 2020 to help facility owners and managers integrate advanced lighting controls and lighting systems with other building or business systems in their facilities. In 2021, 13 participants were recognized for exemplary projects in lighting.

Visit the Technology Campaigns page on the Solution Center to learn more about these and other campaigns.

Design and Construction Allies

The Better Buildings Design and Construction Allies group includes architecture, engineering, and construction firms that are creating strategies to routinely deliver energy-efficient, low carbon buildings. Launched in October 2020, participants are publicly announcing measurable goals for high-performance design and delivery and informing the development of resources, including the following:

- ▶ Building Owners’ and Designers’ Guide to Federal Incentives for High Performance Buildings
- ▶ Embodied Carbon Resource Navigator

Technology Research Teams

Led by experts from DOE’s National Laboratories, Technology Research Teams analyze the latest research and development on a range of building technologies with the goal of providing market-ready solutions to partners. Technical focus areas include plug and process loads, renewables integration, space conditioning, energy management information systems, lighting, and building envelope.

New tools and resources:

- ▶ Utilizing Emerging & Existing Technologies to Reduce Carbon
- ▶ Integrated systems packages resources
- ▶ Updated primer on organizational use of EMIS
- ▶ HVAC Resource Map – updated annually

Better Buildings Webinars

Better Buildings Webinars provide an opportunity for energy professionals to come together with experts and peers to learn about proven best practices, cost-effective strategies, and innovative new ways to approach decarbonization, energy performance, and more. The 2021-2022 Webinar Series was the most well-attended to date.



The United States generates 2.7 billion tons of industrial solid waste and more than 290 million tons of municipal solid waste per year. Access [resources related to waste diversion and circularity at the Better Buildings Solution Center](#).



Leadership in Action

Waste Reduction Pilot

The Waste Reduction Pilot brought nearly 50 partners together in peer exchanges, webinars, and working groups to address common barriers with the help of National Laboratory experts. Partners expressed interest in various topics related to waste, including:

- ▶ Data management
- ▶ Outreach/engagement
- ▶ Emerging technologies
- ▶ Circular economy
- ▶ Embodied energy/energy recovery

Notable outcomes of the pilot include:

- ▶ 45 industrial and commercial partners set ambitious goals, many with a goal of 50% diversion or more.
- ▶ Development of a waste-to-energy calculator to evaluate the energy generation potential from waste streams, along with GHG impact, by considering multiple energy conversion scenarios.
- ▶ Facilitated working groups and webinars on data and measurement, employee outreach and engagement, plastics, e-waste, and making the business case.

Waste Reduction Network

The Waste Reduction Network was launched in 2021 to build on the pilot. Partners are publishing case studies, tracking and reporting waste data, sharing lessons learned, and setting ambitious goals using one of the following types of metrics:

- ▶ Diversion
- ▶ Absolute
- ▶ Zero waste
- ▶ Intensity
- ▶ Waste-to-energy
- ▶ Circularity

Non-industrial pilot partners reported diverting more than 40% of their waste in the past year, including **Parkway Properties** which has achieved a 43% waste diversion rate. Parkway Properties is working towards a 75% diversion rate goal using state of the art imaging technology to track waste streams and create monthly diversion reports. It is also leveraging waste audits, building walkthrough inspections and biannual E-Waste Drives, while developing educational materials and working closely with its janitorial teams to streamline processes and procedures.

Bendix Commercial Vehicle Systems developed a “Zero Waste to Landfill” Certification Process for its manufacturing facilities, promoting zero waste to landfill across all plants in 2021. This effort led to the complete elimination of landfilling as a disposal method from company operations in the U.S. and North America, and the policies developed are now ingrained in the standard operating procedures at the company. The company was also one of the first to join the Better Climate Challenge.

JBG SMITH set a goal to increase its waste diversion rate to 60% by 2030 across its portfolio and created a [composting pilot program](#) to make headway on this effort. The program works to divert organic waste from landfills at a property in Washington, D.C., adding additional composting bins to the loading dock and posting signage to encourage participation. Since the start of its program, more than 10,000 pounds of waste have been diverted from landfill.

Demand for water is increasing while resource availability is decreasing due to climate impacts. Deliberate conservation is crucial to improving resilience while saving energy and lowering operational costs. Access [resources to increase water efficiency at the Better Buildings Solution Center](#).

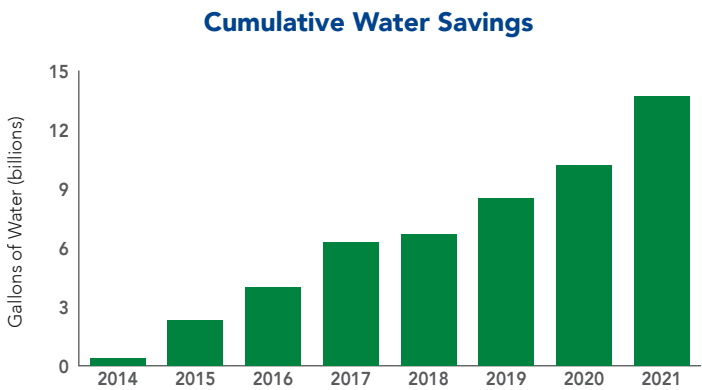


Leadership in Action

Water efficiency lowers operating costs, reduces risk, improves water quality, and saves the energy required to transport and treat it. Efficiency can also help alleviate growing water security concerns, particularly in water-stressed regions of the country. To achieve water efficiency, organizations should:

- ▶ Make a plan to manage water in their buildings and plants.
- ▶ Monitor water usage and track data to detect leaks and enable timely and dynamic water management.
- ▶ Make use of new technologies to optimize systems and enhance performance.

The [Water Savings Network](#), launched in 2021, evolved from the Water Savings Initiative so that any facility owner or manager could engage with their peers and technical experts on water reduction topics.



Erie VA Medical Center (VAMC) replaced water-cooled condensing units with air-cooled units, achieving monthly water savings of more than 55% and over 8 million gallons over the first year of operation.

Flowers Foods implemented both water and energy efficiency measures at a 40-year-old bakery to keep up with demand while unlocking significant savings. The company achieved water savings of nearly 65% and energy savings of more than 20% after installing a heat recovery system, and an air-cooled chiller system that uses significantly less water for cooling.

Emory University created WaterHub, an on-campus system designed to treat and reuse up to 400,000 gallons of water per day, decreasing potable water demand by over one-third. In addition to saving money, the WaterHub is creating scientific and educational opportunities on campus.

Loews Hotels modernized the hot water system at its iconic Miami Beach hotel, replacing three over sized boilers that constantly ran with smart, tankless water heaters. The new equipment learns typical usage patterns and adapts to heat only the amount of water needed, conserving up to 40% of the energy previously wasted.

General Services Administration (GSA) Region 6 reduced water usage by nearly 90% from a 2007 baseline at the Charles F. Prevedel Building by installing low-flow fixtures and a storm water retention system to avoid consumer overuse and encourage water capture.

The partners in DOE’s Better Buildings Initiative represent virtually every sector of the American economy. Collectively, they employ millions of Americans, while saving businesses and municipalities billions of dollars. They are also driving the critical innovations needed to address our climate crisis.

PROGRAM PARTNERS AND ALLIES ARE:



35+
of the Fortune
100 Companies



10
of the Top 25
U.S. Employers



13%
of all U.S. Commercial
Building Space



14%
of the U.S. Manufacturing
Energy Consumption Footprint



100+
State and
Local Governments



100+
Non-Profits and
Industry Associations

Coming Together Across Sectors to Address Common Challenges

In the past year, partners met in a variety of peer exchanges to address common barriers and share solutions that work across multiple building types. Examples include:

- ▶ **Monthly industrial sector decarbonization peer exchanges:** Industrial partners met with experts and shared their experiences on topics including greenhouse gas accounting, green bonds, off-site renewable energy, renewable natural gas, green hydrogen, electrification, energy efficiency, and heat pump technology.
- ▶ **Commercial/public sector Low Carbon Pilot peer exchanges:** Pilot partners met to discuss heat pumps and their applications within buildings, plug and process load integration to increase energy efficiency, and HVAC retrofits, including technologies that can be implemented today to decarbonize these systems.
- ▶ **Commercial sector peer exchanges on various topics, including:**
 - ▶ Commercial real estate, hospitality, and healthcare partners engaged on common water challenges such as submetering, tracking annual water use intensity, and water quality issues like legionella growth.
 - ▶ Hospitality partners and retail, food service, and grocery partners discussed shared challenges related to renewables and energy storage.
 - ▶ Healthcare and commercial real estate partners discussed challenges and solutions related to renewables integration, decarbonization strategies, and financing for Real Estate Investment Trusts (REITs).
 - ▶ Healthcare and higher education partners met to discuss energy efficiency and renewable energy procurement in campus settings, as well as increasing campus resilience in the face of climate change.

Achieving Decarbonization: Strategies that Work Across Sectors

There are many ways for organizations to make progress towards achieving their decarbonization goals. A sampling of the leading opportunities partners in different sectors are pursuing includes the following:

- ▶ Identifying financing opportunities and making the business case for low carbon projects.
- ▶ Exploring cost-effective electrification options and fuel alternatives that meet operational needs and ensure reliability.
- ▶ Partnering with utilities and municipalities to overcome grid capacity restraints with increased electrification
- ▶ Identifying the best on-site and off-site renewable energy options.
- ▶ Increasing staff capacity and fostering internal culture to improve energy efficiency practices.
- ▶ Collaborating with tenants on energy efficiency and decarbonization.
- ▶ Expanding expertise of HVAC equipment vendors and contractors around existing and emerging technologies.

The Sector Spotlights that follow illustrate the many ways partners are driving efficiency and prioritizing decarbonization:

▶ Industrial partners.....	19
▶ Commercial real estate partners.....	21
▶ Healthcare partners.....	23
▶ Retail, food service, and grocery partners.....	25
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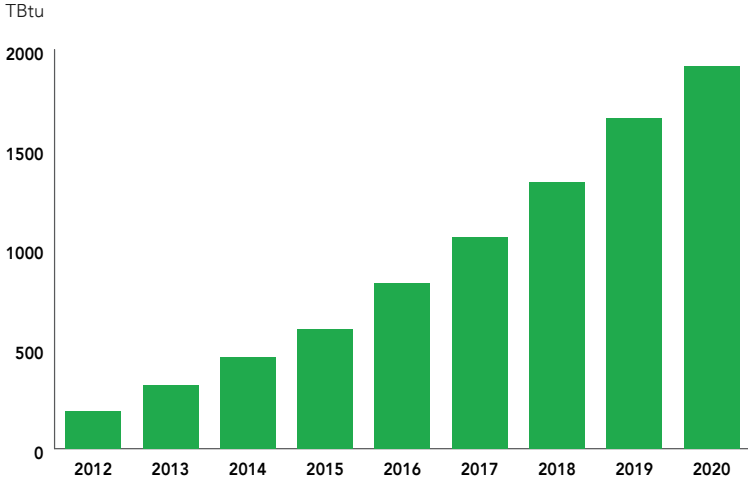
The U.S. industrial sector accounts for roughly one-third of both the nation's total energy consumption² and GHG emissions.³ Despite the challenge of a global pandemic, partners continued to improve the energy intensity of their facilities while reducing water consumption, waste, and greenhouse gas emissions in new and creative ways.

In the past year, Better Plants supported sector partners in a variety of ways, including through:

- ▶ The Industrial Technology Validation Pilot, through which participants evaluate innovative energy and water treatment technologies. Phase 1 completed successfully in the past year, and Phase 2 launched to test innovative and emerging decarbonization technologies in real-world industrial environments and accelerate the adoption of these technologies across the market.
- ▶ The Virtual In-Plant Training (VINPLT) workforce development series, which added new topics such as 50001 Ready and motor systems. VINPLTs have collectively trained almost 1,000 participants through substantive and interactive multi-day workshops.

Better Plants Cumulative Energy Savings

ENERGY SAVINGS (TBtu) - Fall Reporting



271
UNIQUE
SECTOR
PARTNERS

55
BETTER
PLANTS
CHALLENGE

48
BETTER
CLIMATE
CHALLENGE

3,500+ FACILITIES

\$9.3 BILLION SAVED SINCE 2009

If all organizations in the sector reduced their energy-related U.S. emissions by 50% over the next 10 years, it would result in the reduction of more than **970 million** metric tons of CO₂e.¹

Leadership in Action

Better Practice and Better Project Award Winners:

- Bendix Commercial Vehicle Systems** installed a solar photovoltaic system of more than 2,600 ground-mounted panels.
- Charter Steel** installed a sustainable scrap preheat system that recovers waste heat from the electric arc furnace.
- Eastman Chemical Company** implemented a real-time optimization model for utility systems that provides facility operators with recommendations for powerhouse equipment operations.
- Electrolux** created the Green Bond Framework and the Long-term Incentive Program to finance more energy savings projects and link employee compensation with sustainability and climate-related actions.
- Stellantis** implemented the Excellent Plant Shutdown approach, an 8-step systematic approach to improve equipment level energy shutdowns.
- Lineage Logistics** deployed an advanced refrigeration controls platform to maximize operational efficiency.
- SugarCreek Packing Co.** utilized reverse osmosis technology to improve a facility steam system.
- 3M** developed a new energy manual 81 to outline minimum design requirements for new spaces, processes, and utility systems.

- Waupaca Foundry** optimized a facility's compressed air system, increasing energy efficiency by 13.5%.
- Valmont Industries** replaced all of a site's 102 gasoline vehicles with an all-electric fleet of 84 vehicles.
- Los Angeles Department of Water and Power** successfully incorporated demand response into its water operations and reduced pumping load during peak periods.
- PepsiCo** reduced incoming water usage by 25% by improving efficiency of one plant's water filtration system.
- Flowers Foods** used tiered incentive rates from utility programs to expand an operational upgrade project at a bakery into a pipeline of 13 energy efficiency projects.
- Schneider Electric** standardized compressed air leak detection and repair using state-of-art acoustical imaging technology.
- OxyChem** incorporated DOE Better Plants In-Plant on steam systems into corporate training programs and capital project approval processes.
- Ingersoll Rand** addressed fugitive emissions from the facility's use of refrigerants by installing more efficient large capacity heat exchanger units.
- Saint-Gobain Corporation** installed a new recycling technology that grinds and then captures waste gypsum and paper for reuse.

Additional Highlights

Tools and Resources for Industrial Organizations

There are a wide range of tools and resources available to help industrial organizations reach their sustainability goals. Some recent additions include:

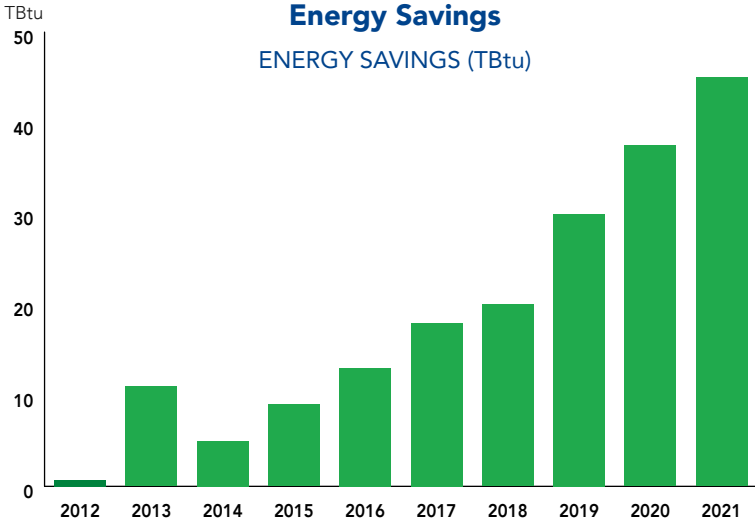
- ▶ A detailed report describing how Better Plants Goal Achievers were able to meet their energy goals.
- ▶ A demand response guidance document for reducing or shifting electricity usage during peak periods.
- ▶ A renewable energy guidance document to navigate the renewable energy market, providing a primer on relevant technologies along with a wide range of renewable power purchasing options.
- ▶ Three "Understanding Your Utility Bills" guidance documents for organizations to learn about and analyze their electric, natural gas, and water and sewer bills.
- ▶ An Implementation Guidance Toolkit with resources for planning projects, tracking progress, and communicating accomplishments.

The commercial real estate (CRE) sector continues to evolve to overcome challenges and capitalize on energy and carbon reduction opportunities. With increased flexibility, the sector has seen a decrease in the space per employee and an increase in the use of co-working space, with more than 80% of occupiers viewing co-working space as a desirable attribute in the buildings that they lease.⁴

CRE partners are demonstrating leadership by overcoming barriers to decarbonization, pursuing financing options, electrifying buildings, enhancing renewable energy procurement, and implementing emerging technologies. With support from DOE, partners are focusing on the following priorities:

- ▶ Highlighting decarbonization pathways focused on electrification, showcasing embodied carbon reduction efforts, and connecting partners with technical research.
- ▶ Developing technology and finance solutions related to renewable energy and storage, including on-site installations and off-site procurement such as power purchase agreements and virtual power purchase agreements.
- ▶ Assisting partners facing challenges in pursuing energy efficiency with an increased focus on healthy buildings and indoor air quality.

Commercial Real Estate Cumulative Energy Savings



77
UNIQUE
SECTOR
PARTNERS

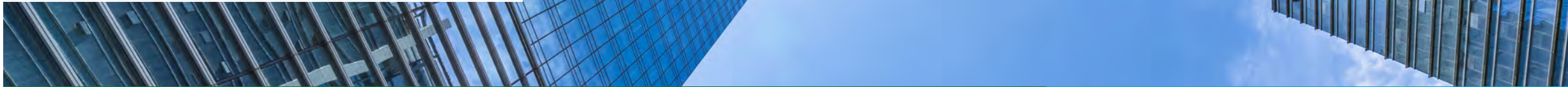
22
BETTER
BUILDINGS
CHALLENGE

13
BETTER
CLIMATE
CHALLENGE

49
BETTER
BUILDINGS
ALLIANCE

7.2 BILLION SQUARE FEET

\$430 MILLION SAVED SINCE 2011



Leadership in Action

Columbia Association, a Low Carbon Pilot partner, will avoid the use of nearly 4,000 therms of natural gas each year by replacing a large propane water heater with two smaller heat pump water heaters to eliminate a source of on-site fossil fuel combustion. It also utilized a high-efficiency heat pump technology at one of its community pool facilities.

Kilroy Realty Corporation participated in a Green Janitor Education Program to help janitorial staff understand the science behind green cleaning, how to identify energy and water waste in a building, and how they can play a part in improving building sustainability. More than 40% of Kilroy's janitorial staff are involved in the program.

Link Logistics partnered with a community solar program to install a large-capacity solar photovoltaic system to mitigate challenges from net-metering limits in its jurisdiction. This project provides \$1 per square foot of revenue from the leasing of the roof space, and became the foundation of a scalable solar implementation program across Link's portfolio.

The Tower Companies achieved a 90% return on investment in the first year of an office building solar project by leveraging a direct ownership model paired with solar renewable energy credits (SREC) revenue and state/federal grants.

WashREIT installed solar equipment on two multifamily properties in Washington, D.C. to lower operating expenses and help achieve its 20% carbon emissions reduction target. The company will own the system with plans to monetize the SRECs.

The **Hawaiian Airlines** energy team rolled out employee engagement activities that included an energy treasure hunt and the production of a video detailing office energy-savings tips.

Highwoods Properties is helping to create a pipeline of college graduates trained to control and reduce energy consumption in the built environment. The co-op program it participates in has identified projects and provided ENERGY STAR® support, which has helped save over \$800,000 for projects since 2017.

LBA Realty developed a Sustainability-as-a-Service (SaaS) offering for its tenants to help lower its operating costs and improve building health, all while providing building performance data to LBA.

Empire State Realty Trust completed energy audits in 4 million square feet of tenant space, leading to improvements that found up to 50% energy reductions for tenants; the company received Gold recognition for Green Lease Leaders in 2021.

If all organizations in the sector reduced their energy-related U.S. emissions by 50% over the next 10 years, it would result in the reduction of more than **100 million** metric tons of CO₂.⁵

Additional Highlights

Green Lease Leaders

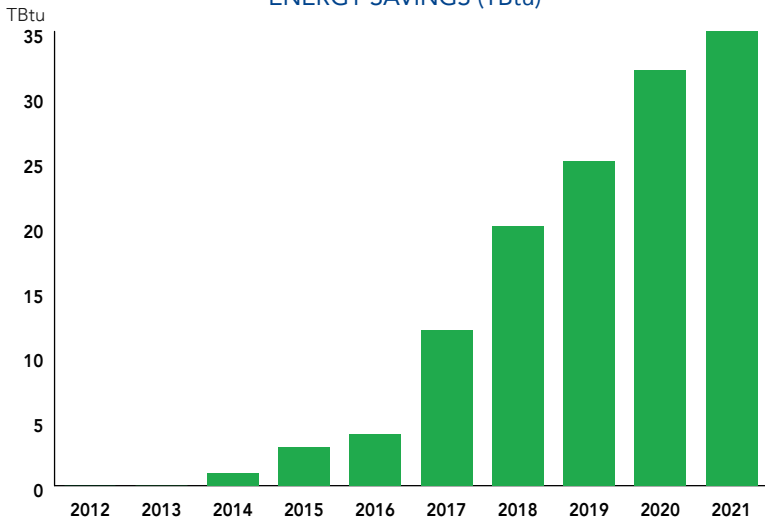
Green Lease Leaders is a national recognition program honoring landlords, tenants, and partnering real estate practitioners that incorporate green leasing to drive high-performance and healthy buildings. A new Platinum recognition level seeks to specifically address the greater ESG impact of leasing practices in Green Lease Leaders' footprint, which covers over 4 billion square feet in commercial real estate, multifamily, healthcare, data centers, retail space, and more. In 2021, more than 40 organizations were recognized through Green Lease Leaders, representing a diverse range of buildings, from large and small commercial offices to industrial buildings to data centers. The program is a partnership with the Institute for Market Transformation.



The U.S. healthcare system contributes 10% of the nation’s carbon emissions and 9% of harmful non-greenhouse air pollutants.⁶ Deeply affected by the COVID-19 pandemic, leading organizations in the sector continue to look for balance between energy efficiency and their top priority: patient care. Recognizing the connections between climate change, energy efficiency, and human health, partners in the healthcare sector are focusing on the following priorities:

- ▶ Creating solutions that demonstrate actionable decarbonization pathways in healthcare through electrification, resiliency planning, and ultra-high building efficiency.
- ▶ Curating and showcasing successful telehealth and space utilization strategies in healthcare, engaging partners to identify the energy implications of such strategies, and highlighting how the expansion of telehealth services can enable greater equitable access to quality healthcare.
- ▶ Engaging partners to identify the diversity of issues around water in healthcare, including conservation, regional drought risk, and health concerns from bacterial growth.

Healthcare Cumulative Energy Savings
ENERGY SAVINGS (TBtu)



44
UNIQUE
SECTOR
PARTNERS

11
BETTER
BUILDINGS
CHALLENGE

3
BETTER
CLIMATE
CHALLENGE

32
BETTER
BUILDINGS
ALLIANCE

700 MILLION SQUARE FEET

\$340 MILLION SAVED SINCE 2011



Leadership in Action

Gundersen Health System completed a 3-phase warehouse and office renovation of the Consolidated Services Center in West Salem, WI. Adding solar, geothermal, and battery storage, the goal is to achieve a microgrid configuration to make the facility more energy independent and resilient.

UW Health broke ground on a state-of-the-art ambulatory clinic that will host an approximately 1 MW solar carport on top of the parking garage. Funded by a green bond, this project is expected to achieve a 20% annual carbon reduction, as well as reduced snow removal costs, lowered environmental impacts from salt, and vehicle protection from the elements.

Physicians Realty Trust is collaborating with DOE and the National Renewable Energy Laboratory to understand the impact of plug and process loads on healthcare energy use, especially from imaging equipment, and exploring solutions that could lower their impact by up to 50%.

UW Health, University of Nebraska Medical Center, University of Maryland Medical Center, and Physicians Realty Trust hosted a peer exchange for sector partners on pandemic preparedness and response, and reengaging stakeholders around sustainability.

Atlantic Health System turned on a co-generation plant in late 2021 at its Morristown Medical Center campus. The plant provides more reliability and electric redundancy while significantly lowering utility costs. It also uses a natural gas-powered turbine to generate electricity and utilizes the hot exhaust gas to generate steam.

University of Utah Health saved nearly \$190,000 by reducing annual chilled water consumption after installing a building energy management information system and optimizing air handling units. Positive results provided a business case for future projects.

American Society for Health Care Engineering (ASHE), a Better Buildings Affiliate, published the ASHE Sustainability Guide, providing step-by-step directions for developing and executing a sustainability program in healthcare facilities, with an expanded view into sustainability and decarbonization.

Health Care Without Harm, a Better Buildings Affiliate, released *Climate Resilience for Health Care and Communities: Strategies and Case Studies*, a white paper which provides a framework for healthcare systems to improve climate resilience of its facilities and communities, as well as explore how to leverage investments and capital to support equitable decarbonization.

If all organizations in the sector reduced their energy-related U.S. emissions by 50% over the next 10 years, it would result in the reduction of more than **48 million** metric tons of CO₂.⁵

Case Study

Healthcare Realty's Medical Office Solar

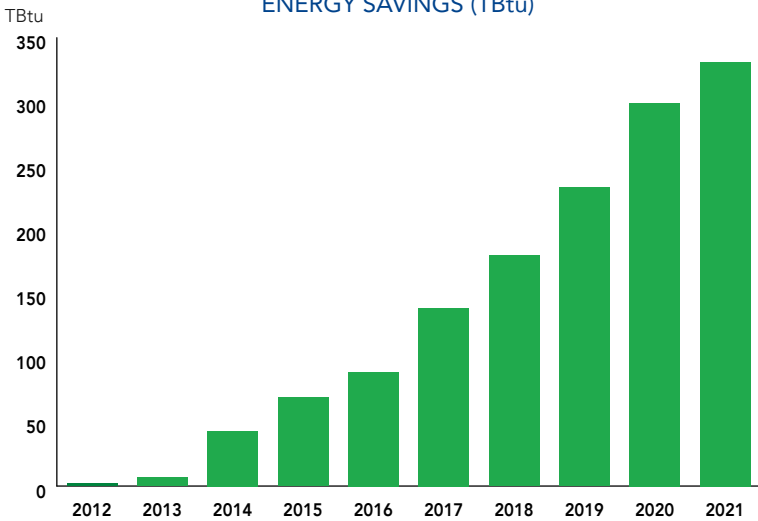
Healthcare Realty partnered with a renewable energy advisor to establish its solar program by evaluating renewable energy opportunities across its portfolio and identifying ideal properties for solar installation. Healthcare Realty is leveraging renewable energy as an important strategy to achieve its energy and GHG emissions reductions goals by 2026. All of the projects in the pipeline will be financed through third-party ownership, via power purchase agreements or through a feed-in tariff program.



Recognizing the risks posed by climate change, retail, food service, and grocery (RFSG) companies are demonstrating leadership by setting ambitious carbon reduction goals and voluntarily reporting greenhouse gas emissions. According to the National Retail Federation, 75% of the largest retailers provide sustainability information on their company websites and 60% publish reports for investors.⁷ Better Buildings partners are also sharing their strategies for making buildings and fleets more energy efficient and decarbonizing their operations.

- To help sector partners address barriers to decarbonization, the program:
- ▶ Published Evaluating New Energy Efficiency Products, a resource with steps for assessing the suitability of new energy reducing technologies or products in facilities.
 - ▶ Provided a forum for partners to learn from each other on issues related to renewables and energy storage.
 - ▶ Shared information on commercial kitchen decarbonization strategies.

Retail, Food Service, and Grocery Cumulative Energy Savings
ENERGY SAVINGS (TBtu)



56
UNIQUE
SECTOR
PARTNERS

35
BETTER
BUILDINGS
CHALLENGE

2
BETTER
CLIMATE
CHALLENGE

20
BETTER
BUILDINGS
ALLIANCE

1.8 BILLION SQUARE FEET

\$3.1 BILLION SAVED SINCE 2011



Leadership in Action

Walgreens leveraged advanced lighting system capabilities during two pilot projects: the first equipping shopping baskets with Bluetooth asset tags to learn about traffic patterns, and the second testing a new life safety program to automate identification and reporting of failed components. These projects provided valuable insights to its operations, helped reduce maintenance efforts, and enhanced the customer experience. Walgreens earned recognition for these projects from the Integrated Lighting Campaign.

Wendium of Florida, Inc., a franchisee of The Wendy’s Company, installed warewashing systems at its restaurants to reduce water consumption and improved its preventative maintenance and leak monitoring processes, which helped the company achieve more than 30% water savings across its building portfolio to surpass its water reduction goal eight years ahead of schedule.

The **Retail Industry Leaders Association (RILA)** developed a series of renewable energy primers on the topics of owned on-site systems, on-site power purchase agreements, renewable energy credits, and global procurement to help retailers understand the pathways for integrating renewable energy into their portfolios.

Life Time, Inc. has reduced energy use by 35% and water use by nearly 60% at its 110,000-square-foot club in Chanhassen, MN through a series of building improvements over the past decade, including LED lighting retrofits, upgrading rooftop HVAC units with variable-frequency drives, and undergoing a full building commissioning.

The Wendy’s Company joined the Low Carbon Pilot aiming to reach low carbon status at two restaurants by 2023 by implementing deep energy efficiency projects and exploring on-site renewable energy and power purchase agreement options for off-site utility offerings.

Life Time, Inc. and **Walgreens** were featured in the Association of Energy Services Professionals Energy Intel magazine, sharing their strategies for maintaining a focus on energy efficiency while adapting their operations to the challenges of the COVID-19 pandemic.

Sheetz, Inc. completed a building management system retrofit program, upgrading systems at approximately 600 new and existing stores to achieve a 10% reduction in energy usage while better maintaining temperature control for comfort and streamlining its maintenance process.

If all organizations in the sector reduced their energy-related U.S. emissions by 50% over the next 10 years, it would result in the reduction of more than **89 million** metric tons of CO₂.⁵

Additional Highlights

Kohl’s, Inc. and **IKEA Retail U.S.** joined the Better Climate Challenge, becoming the first two retailers to partner with DOE as they pursue a 50% reduction in scope 1 and 2 greenhouse gas emissions across their operations.

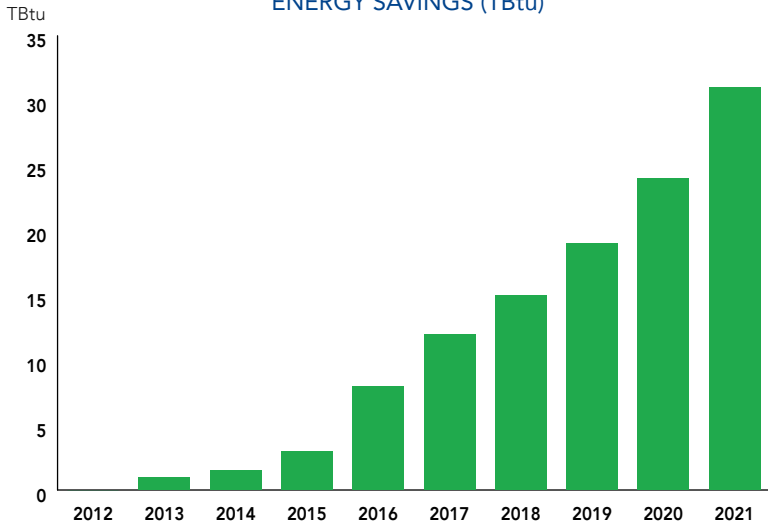
- ▶ **Kohl’s, Inc.** has pledged to cut scope 1 and 2 greenhouse gas emissions in half across more than 80 million square feet of stores, distribution centers, and office space by 2025. The company will meet this goal by focusing on lighting and HVAC upgrades, pursuing ENERGY STAR and LEED® certified buildings, and expanding renewable energy. Kohl’s announced plans to install rooftop solar arrays on 15 additional stores during 2022, increasing its installed solar capacity to nearly 57 megawatts.
- ▶ **IKEA Retail U.S.** aims to be climate positive in its own operations by 2030 and has committed to being powered by 100% renewable energy. IKEA Retail U.S. has installed solar at more than 90% of its locations across the U.S. and continues to invest in solar energy. In early 2021, the company announced the completion of its first solar parking lot at IKEA Baltimore and planned to install seven similar solar projects at stores in Maryland and California. Collectively, the eight solar projects provide approximately 10.7 GWh of yearly production.

The hospitality sector has continued to battle through impacts posed by the COVID-19 pandemic. Through a survey of more than 500 hotels, more than 85% noted that operations have been moderately or significantly impacted through supply chain disruptions.⁸

Regardless of these challenges, Better Buildings hospitality partners have continued to pledge their commitment to climate action and invest in energy and water saving technologies, all while continuing to prioritize the guest experience. Examples of these efforts include:

- ▶ Incorporating smart building technology (IoT) in guestrooms to streamline operations and reduce overall energy consumption.
- ▶ Focusing on waste reduction efforts, including waste accrual from new construction and development, as well as single-use waste used in hotel operations.
- ▶ Prioritizing ISO 50001 Ready certifications through the implementation of energy efficiency measures.

Hospitality Cumulative Energy Savings
ENERGY SAVINGS (TBtu)



14

UNIQUE
SECTOR
PARTNERS

6

BETTER
BUILDINGS
CHALLENGE

3

BETTER
CLIMATE
CHALLENGE

7

BETTER
BUILDINGS
ALLIANCE



1 BILLION SQUARE FEET



\$290 MILLION SAVED SINCE 2011

Leadership in Action

IHG Hotels & Resorts, a Low Carbon Pilot partner, is testing different networked thermostat models in short and extended stay hotels. IHG will monitor several factors while testing the thermostats, including HVAC runtime, usability, and guest experience. Once the testing concludes, IHG will review the data to determine optimal specifications and operational guidelines for new and existing hotels. This technology can improve building performance by reducing energy consumption by setting back the thermostat when rooms are unoccupied and providing hotel staff with better tools for energy monitoring and management.

Marriott International is establishing a Science Based Target and aims to reduce its carbon intensity by 30% from a 2016 base year. Marriott's decarbonization pathway prioritizes the installation of energy efficiency technologies such as LEDs and low-flow water fixtures, while also including renewable energy projects. In addition to these efforts, Marriott has also launched the Marriott Infrastructure Resilience Adaptability (MIRA) project to ensure that assets managed by Marriott are resilient against climate-related risks.

Travel + Leisure Co. is adding renewable energy capacity as a complement to its energy efficiency strategy. At the Wyndham Limetree Resort in St. Thomas, the company installed more than 400 solar panels to generate nearly 200 KW of electricity. At its WorldMark Clear Lake Resort, Travel + Leisure Co. is developing a nearly 220 KW on-site project featuring tilt ports, bifacial panels, and a 500 KW battery to enhance resort resiliency. This project includes more than 550 solar panels with the capability to produce 65% of the resort's electric needs.

Loews Hotels continued to prioritize energy efficiency after achieving its Better Buildings Challenge energy reduction goal, achieving ISO 50001 Ready certification for all its sites. The ISO 50001 certification provides a framework to implement energy management systems at the building level, track the progress of those measures, and understand opportunities for additional savings.

If all organizations in the sector reduced their energy-related U.S. emissions by 50% over the next 10 years, it would result in the reduction of more than **39 million** metric tons of CO₂.⁵

Case Study

Hilton's Decarbonization Leadership

Hilton was the first hospitality organization to join the Better Climate Challenge and was also the first major hotel brand to set a Science Based Target initiative. These initiatives directly align with Hilton's ESG strategy, "Travel with Purpose," to address and cut their hotels' environmental footprints in half by 2030. Hilton's pathway to achieving its energy efficiency and greenhouse gas emissions goals includes:

- ▶ Installing LEDs and ENERGY STAR certified kitchen equipment
- ▶ Installing low-flow/water efficiency fixtures
- ▶ Replacing outdated chillers and boilers with more efficient models
- ▶ Identifying on-site renewable energy projects

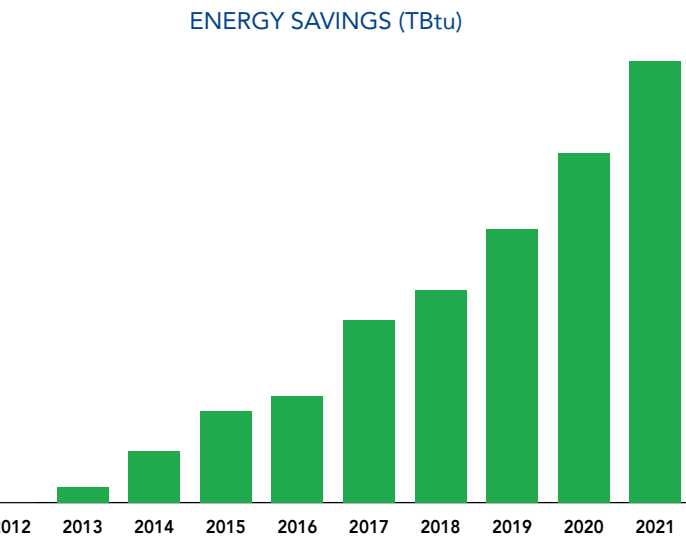


As many campuses returned to in-person operations during the past year, the COVID-19 pandemic continues to impact campus budgets and staff capacity. Historic turnover has also created implications for energy efficiency and sustainability work on campuses among others. To meet their energy and emissions reduction goals, sector partners are identifying technology opportunities to decarbonize energy intensive spaces (i.e., labs, dining, medical), connecting with financing opportunities for large infrastructure improvements, and increasing staff expertise in plant maintenance and software building.

In the past year, the program connected partners with the following decarbonization resources relevant for sector partners:

- ▶ [Low Carbon Technology Strategies Toolkit](#) with resources to support owners and operators of existing buildings in planning retrofit and operational strategies to achieve deep carbon reductions.
- ▶ [Decarbonizing HVAC and Water Heating](#) to help conduct the technical, economic, and feasibility assessment needed to convert to all-electric heating solutions, including heat pumps.

Higher Education Cumulative Energy Savings



51
UNIQUE
SECTOR
PARTNERS

21
BETTER
BUILDINGS
CHALLENGE

7
BETTER
CLIMATE
CHALLENGE

28
BETTER
BUILDINGS
ALLIANCE

420 MILLION SQUARE FEET

\$276 MILLION SAVED SINCE 2011

If all organizations in the sector reduced their energy-related U.S. emissions by 50% over the next 10 years, it would result in the reduction of more than **10 million** metric tons of CO₂.⁵

Leadership in Action

Pace University set a new goal of 50% reduction in energy intensity by 2031 after achieving its initial program goal. Improvements in energy efficiency will be a large part of the university's decarbonization journey as a partner in the Better Climate Challenge.

The University of Virginia (UVA) completed a climate action plan that focuses on addressing scope 1 & 2 emissions at the district scale to become carbon neutral by 2030. UVA further demonstrated its leadership by pledging to become fossil fuel free by 2050 and joining the Low Carbon Pilot.

Colorado State University (CSU) completed one of the largest geo-exchange projects in the western U.S. and has 6.7 MW of solar PV on campus in both ground- and roof-mount systems. CSU has a goal to utilize 100% renewable electricity by 2030 and joined the Better Climate Challenge.

Bard College adopted geothermal technology for heating and cooling in roughly 40% of total building square footage with plans to add over 1 MW of solar PV on campus to the existing 300 kW in on-site PV. Bard College also joined the Better Climate Challenge program.

The University of Chicago reduced scope 1 and 2 emissions by 13% between 2018 and 2020, and will continue its decarbonization efforts by setting a 50% emissions reduction goal through the Better Climate Challenge while planning to reduce its energy use intensity by at least 20%.

Stevens Institute of Technology issued the New Jersey Education Facilities Authority's first-ever green bond to complete construction of a three building, \$175 million expansion for housing and campus activities, all designed to meet LEED® Silver standards.

Northwestern University is pursuing net zero emissions by 2050 in its built environment, in part through an [energy-as-a-service agreement](#) that is providing engineering support for projects and training for students.

Community College of Allegheny County (CCAC) completed a 543 kW solar installation to provide 30% to 40% of its North Campus electricity needs. CCAC will save about \$750,000 in energy costs over the next 28 years. The project was financed using a power purchase agreement and did not require a capital expenditure from the college.

Case Study

Allegheny College Historic Building Retrofit

Allegheny College completed renovations to Bentley Hall, the historic cornerstone of the college's campus and listed in the National Register of Historic Places. It expects to achieve nearly 40% in energy cost savings and more than 25% in water savings after replacing the roofs, windows, and deteriorated exterior wood, and updating mechanical, electrical, and plumbing systems. Adding a geothermal system and creating occupant sensors and controls further reduced energy use. The college modernized the building's amenities while preserving the historic aesthetics of the structure.

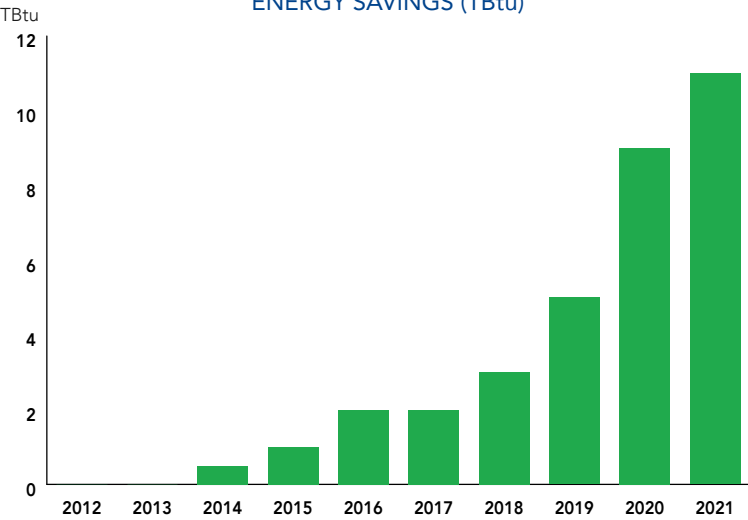


K-12 schools represent the nation’s second largest sector of public infrastructure spending, after roads and highways. Increasing energy efficiency in the nation’s K-12 schools by 20% would yield at least \$1.5 billion in annual cost savings.⁹ An additional opportunity in K-12 schools is to address emissions from 480,000 school buses, which are mostly diesel and represent the country’s largest fleet of public transportation.¹⁰ As K-12 schools continue operations through COVID-19-related challenges while prioritizing environmental goals, the sector is increasingly focusing on the following:

- ▶ Updating HVAC systems to better filter and circulate air while reducing energy consumption.
- ▶ Electrifying school facilities and school buses and, in increasing instances, utilizing electric buses as a source of battery power during outages.
- ▶ Training the next generation’s workforce for careers in energy management that support efficiency goals.
- ▶ Reducing emissions through the installation of on-site solar, frequently made possible by utility and state incentives.

K-12 Schools Cumulative Energy Savings

ENERGY SAVINGS (TBtu)



23
UNIQUE
SECTOR
PARTNERS

23
BETTER
BUILDINGS
CHALLENGE

2
BETTER
CLIMATE
CHALLENGE

245 MILLION SQUARE FEET

\$110 MILLION SAVED SINCE 2011



Leadership in Action

Sector partners are prioritizing energy efficiency and setting climate goals while striving to operate K-12 schools for optimal health and safety.

Fairfax County Public Schools set a new 25% energy reduction goal by 2030 and committed to both carbon neutrality by 2040 and a 50% emissions reduction by 2030. The district uses software to monitor over 10,000 utility bills per year at nearly 240 locations to identify anomalies in energy usage and has been named an ENERGY STAR Partner of the Year for five consecutive years. All new buildings and major renovation projects that begin planning and design in 2021 must achieve zero net energy performance.

Fort Worth Independent School District achieved its 20% portfolio-wide energy reduction goal in 2021, five years ahead of schedule. The district has installed over 800 WiFi thermostats and hired dedicated energy specialists to conduct energy audits and oversee maintenance of project technologies. The school district uses an app to alert for real-time energy consumption spikes at meters, allowing for quick resolutions. The district has earned ENERGY STAR certification for more buildings than any other in Texas.

Albuquerque Public Schools, NM installed a solar plus storage system at Atrisco Heritage Academy High School, consisting of an 850 kW solar array combined with a 721 kW Tesla Megapack 2 battery storage system which will reduce energy costs by \$3.5 million over the system’s 25-year lifetime.

Los Angeles Unified School District, CA set a GHG reductions goal of 50% over 10 years as an inaugural partner in the Better Climate Challenge. Towards this goal, LAUSD purchased 10 zero-emissions school buses, each of which saves \$10,000 annually in lower maintenance costs and reduces emissions by 54,000 pounds of CO₂ per year.

River Trails School District 26, IL set a GHG reduction goal of 50% over 10 years as an inaugural partner in the Better Climate Challenge. At Prairie Trails School, the district installed rooftop solar and a new dedicated outdoor air system (DOAS), combined with a new highly-efficient heat recovery electric variable refrigerant flow (VRF) heating and cooling system as part of its participation in the Low Carbon Pilot.

If all organizations in the sector reduced their energy-related U.S. emissions by 50% over the next 10 years, it would result in the reduction of more than **24 million** metric tons of CO₂.⁵

Case Study

Parkway School District, MO

Parkway School District is complementing its successful energy efficiency strategy with renewable energy projects to achieve greater savings. The district installed a central geothermal plant and a 75 kW solar array at South High School, its largest energy consumer. The geothermal chiller plant upgrade is a borefield system with 120 vertical wells 500 feet deep, replacing aging chillers and eliminating existing heat boilers. The new array adds to an existing 25 kW array, bringing total on-site capacity to 100 kW of rooftop solar PV. The two systems achieved savings of at least 1.4 million kWh and increased the school’s ENERGY STAR score by 65% from 43 to 71.

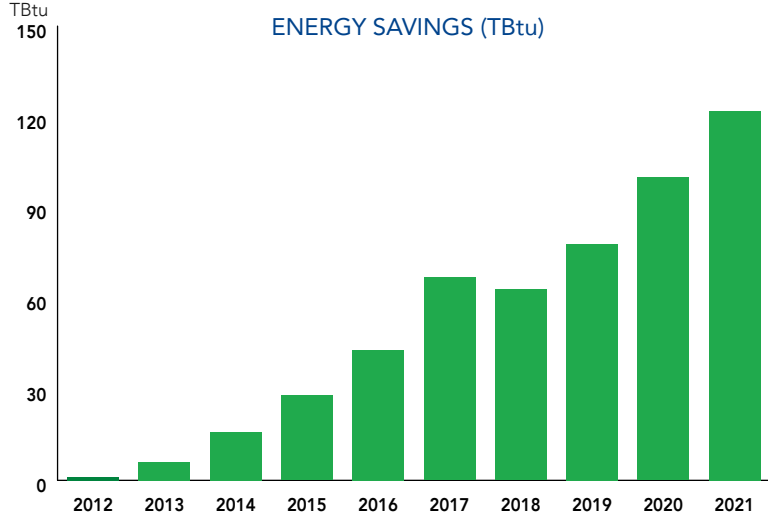


State and local government buildings consume 1.1 and 2 QBTu each year,⁹ respectively, and have the potential to save \$2.1 billion and \$3.7 billion annually through a 20% improvement. Leading partners are pursuing significant energy savings while prioritizing health and safety protocols that optimize building operations for fluctuating occupancy levels.

During the past year, Better Buildings has provided high-impact resources and tools for public sector partners. Examples include:

- ▶ Promoting the State and Local Planning for Energy (SLOPE) Platform and its new Scenario Planner tool through webinars.
- ▶ Leveraging the Energy Data Management Guide and recent partner success strategies through instructional webinars.
- ▶ Participating in accelerators focused on public-sector facilities, including the Sustainable Corrections Infrastructure Partnership (SCIP) and Sustainable Wastewater Infrastructure of the Future (SWIFt) Initiative.

State and Local Government Cumulative Energy Savings



103

UNIQUE
SECTOR
PARTNERS

52

BETTER
BUILDINGS
CHALLENGE

18

BETTER
CLIMATE
CHALLENGE

54

BETTER
BUILDINGS
ACCELERATOR



750 MILLION SQUARE FEET



\$1.2 BILLION SAVED SINCE 2011

Leadership in Action

Chattanooga, TN, enhanced operational resilience during extreme weather events and maximized future energy and water savings through upgrades to the Moccasin Bend Wastewater Treatment Plant. Project highlights include the installation of a 10-acre solar array that is expected to offset enough energy needs to save approximately \$400,000 per year, LED lighting retrofits expected to save over \$60,000 a year, and water system improvements saving over 85 million gallons a year.

The **State of Maryland's** 2021 annual report by its Commission on Climate Change detailed more than 50 recommendations on how to meet the state's goal to reduce emissions 50% by 2030, as well as a plan that identifies low-cost pathways for decarbonizing the residential and commercial buildings sectors. Maryland is the first state to join DOE's Better Climate Challenge.

The **Commonwealth of Massachusetts** funded comprehensive decarbonization studies among state universities to provide high-level roadmaps and technological solutions for electrification of almost all campus heating and cooling needs. Measures analyzed and recommended include converting from steam to low temperature hot water, installing ground- and air-source heat pumps, and deploying thermal storage.

Houston, TX, is turning a former landfill into the largest urban solar farm in the U.S. by installing 70 MW of solar panels on 224 acres and generating enough electricity to power 12,000 homes.

The **State of Rhode Island's** Department of Education launched an initiative to install LED lighting in the public schools of the state's five communities of greatest economic need, and is providing upgrades while covering 100% of the project funding.

Santa Fe, NM, utilized energy savings performance contract to finance facility improvement measures that will reduce energy and water consumption, estimated to save nearly \$750,000 per year in utility costs. The project includes a city-wide solar project that is estimated to add 2.75 MW of renewable energy to the city's portfolio, which will offset nearly 80% of the city's electricity usage.

Will County, IL, reduced electricity use at the county's health center by 50% and saved \$16,000 over a six-month period. Through the collaborative effort of county energy specialists and maintenance teams, and a partnership with local utility representatives, the county also uncovered and corrected billing inaccuracies.

If all organizations in the sectors reduced their energy-related U.S. emissions by 50% over the next 10 years, it would result in the reduction of more than **101 million** metric tons of CO₂.⁵

Additional Highlights

Highlights from the Low Carbon Pilot

Local government partners completed year one of their Low Carbon Pilot commitment and demonstrated different pathways for achieving low carbon emissions in specific buildings.

Boston, MA, focused on upgrading building controls, installing rooftop solar, and fuel switching at a historic performing arts theater from 1918.

Columbia, MO, implemented a strategy to install solar and an on-site storage system to replace a propane generator.

Knoxville, TN, focused on replacing existing HVAC units with high efficiency, all-electric upgrades and lighting improvements.

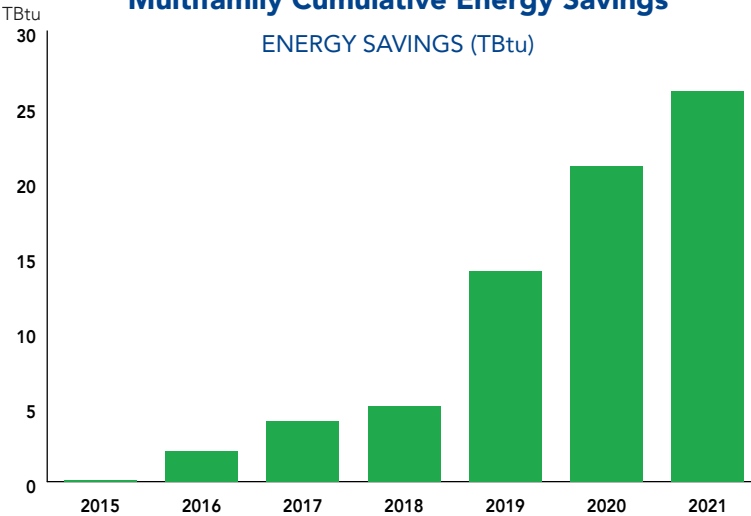
Orlando, FL, concentrated on lighting retrofit projects, solar installation, and an HVAC system replacement. The city is also developing Resilience Hubs that will serve low-income communities during grid outages.



Adopting energy efficiency and climate resilience strategies can help address two of multifamily rental housing’s top challenges—the growing affordability gap and increased vulnerability to climate change. The COVID-19 pandemic has exacerbated what was already a severe shortage of affordable rental homes for low-income Americans, with national median year-over-year rents increasing an unprecedented 18% in 2021.¹¹ Sector partners are leading the way to a safer, more resilient, lower carbon future by setting ambitious, portfolio-wide carbon reduction goals and implementing decarbonization strategies of remarkable scope and ambition. Examples include:

- ▶ Adopting state-of-the-art Passive House approaches for new developments, including implementing two of the largest Passive House projects in the U.S. in New York City.
- ▶ Demonstrating that affordable housing projects meeting Passive House energy efficiency standards can be built at a low or no-cost premium.
- ▶ Achieving high performance retrofits targeting 60% to 80% energy savings through prefabricated insulative facades, heat pumps, and energy recovery ventilation systems.

Multifamily Cumulative Energy Savings
ENERGY SAVINGS (TBtu)



92
UNIQUE
SECTOR
PARTNERS

87
BETTER
BUILDINGS
CHALLENGE

9
BETTER
CLIMATE
CHALLENGE

620 MILLION SQUARE FEET
(712,000 HOUSING UNITS)

\$247 MILLION SAVED SINCE 2014

7 OUT OF THE 10 LARGEST
PUBLIC HOUSING AUTHORITIES

If all organizations in the multifamily sector reduced their energy-related U.S. emissions by 50% over the next 10 years, it would result in the reduction of more than 55 million metric tons of CO₂.⁵

Leadership in Action

Standard Communities completed a LEED and Enterprise Green Communities certified rehabilitation of Fort Chaplin Park Apartments, a 549-unit campus in Washington, D.C. The site has a 1.2 MW community solar system that generates approximately \$500 of utility savings per participating household per year. Measures included high efficiency HVAC and gas-fired water heaters, ENERGY STAR appliances, high efficiency insulated vinyl windows, and a green roof.

The Housing Authority of the City of San Buenaventura completed a \$28 million development of Willett Ranch, a 50-unit property for low-income seniors. The GreenPoint Rated project includes insulation with post-consumer and -industrial recycled content, a high-efficiency irrigation system, and solar PV.

BRIDGE Housing installed 8.04 MW of community solar energy across 40 affordable housing communities, with approximately 70% of the energy provided to low-income residents for free. Made possible through California’s Solar on Multifamily Affordable Housing program, the program has saved BRIDGE Housing residents nearly \$1.3 million in its first year and is expected to achieve \$34 million in cost savings over the 20-year contract period.

Cambridge Housing Authority completed a \$114 million rehabilitation of Millers River, a 304-unit high-rise for low-income seniors. The Enterprise Green Communities certified project has a “tri-gen” CHP system, supplying the building with thermal energy for space heating in the winter, air conditioning through an absorption chiller in the summer, and water heating.

Trinity Management completed construction of 425 Grand Concourse, one of the largest Passive House projects in the U.S. The 26-story high rise in the Bronx, New York, will consume up to 70% less energy than a conventional housing project and will provide 277 units of affordable housing. The structure incorporates a high-performance envelope and will feature energy-efficient lighting systems, building mechanicals, and facilities.

WinnCompanies completed a \$32 million historic adaptive reuse of the 100-year-old East Haven High School in East Haven, Connecticut. Now called The Tyler, the 70-unit building was designed and built to Passive House standard, using a VRF HVAC system, energy recovery ventilation, comprehensive exterior insulation, ENERGY STAR appliances, and a 90 kW solar array.

Case Study

New York City Housing Authority (NYCHA)
NYCHA has partnered with New York State agencies to launch a competition for manufacturers to develop a new heat pump that can better serve the needs of existing multifamily buildings and accelerate the transition to a carbon-free economy. Through an RFP, heating and cooling manufacturers have been challenged to develop a unitary, packaged cold climate air source heat pump intended to be easily installed through an existing window. NYCHA has connected with Better Buildings Challenge partners to gain broader market support and spur clean energy innovation in affordable housing.

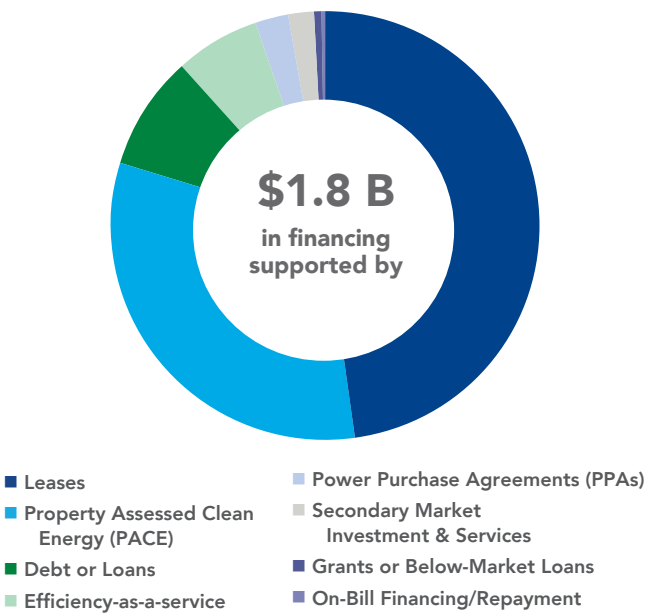


The accelerating adoption of carbon reduction targets has spurred an increase in carbon-focused financing activities and innovative financing approaches. Examples of these approaches include:

- ▶ Increasing use of contracting vehicles that track carbon impacts, such as green bonds, and emphasizing the tracking of carbon impact in financing mechanisms, such as efficiency-as-a-service and energy savings performance contracts.
- ▶ Including carbon-related decision metrics, such as abatement efficacy, in investment decisions.
- ▶ For some equity investors and even debt investors, including explicit emissions reduction requirements from organizations that accept capital beyond simple carbon tracking.

The number of Financial Allies grew with commitments from BlocPower, Budderfly, Counterpointe Sustainable Real Estate, Kyotherm, Skyven Technologies, and Minimise.

Financial Ally Service Offerings



54
SECTOR
ALLIES



\$28 BILLION FINANCED SINCE 2012



\$1.8 BILLION FINANCED IN THE PAST YEAR



Leadership in Action

Hannon Armstrong established a \$100 million “CarbonCount Green Commercial Paper Note” program. This note will allow Hannon Armstrong to allocate proceeds to acquire or refinance eligible green projects to accelerate behind-the-meter, grid-connected, and sustainable infrastructure projects.

BlocPower was selected by the city of Ithaca, NY to provide city-wide electrification as part of Ithaca’s carbon reduction goals. This project can reduce Ithaca’s footprint by 40% upon completion, with an estimated savings of 400,000 metric tons CO₂ per year. It is also estimated to yield an equivalent of 400 jobs in green construction.

Petros PACE Financing financed an \$89 million C-PACE project at 111 Wall Street, the first program completed as part of NYC’s recently reactivated program. This is the single largest C-PACE transaction closed in the U.S. to date.

Metrus Energy increased its funding commitment to \$200 million to support businesses, schools, hospitals, and local governments in accelerating progress on sustainability goals, increasing resiliency, and mitigating climate change. Metrus Energy’s commitment is part of its pledge and participation in *America is All In*.

Redaptive partnered with Iron Mountain Data Centers to roll out efficiency measures through the “as-a-service” model. This project unlocked \$750,000 in operating savings in 2021 and will result in increased savings across 174 North American sites. This program incorporated a multi-technology approach with savings from lighting, plug load management, HVAC measures, and envelope improvements.

Connecticut Green Bank released a “Green Liberty” crowdfunding campaign, allowing retail investors to invest directly in the Green Bank mission to confront climate change and carbon emissions. Proceeds will support Eversource’s Small Business Energy Advantage (SBEA) program by allowing SBEA participants to borrow up to \$100,000 at 0% interest to improve its carbon impact.

Citi announced a \$1 billion “Social Finance Bond” that supports social-focused developments in emerging markets around the world. Proceeds from the bond will finance a range of projects, including those that expand access to financial services, affordable housing, basic infrastructure, healthcare, and education in underserved and unbanked communities in emerging markets.

Additional Highlights

Financing Decarbonization

Better Buildings Financial Allies are working with partners in different sectors to address the following carbon-centric financing barriers:

- ▶ Financing contracts do not always explicitly require tracking of energy savings, obscuring the carbon impact of financed energy improvements.
- ▶ Lack of visibility into the environmental impact of financed projects.
- ▶ Lack of recognition for organizations financing large-scale decarbonization incentivizes projects that prioritize financial returns rather than maximize environmental impact.
- ▶ Complex ownership structures can create misaligned incentives like the “principal-agent problem” that increase the effort needed to act on carbon reduction opportunities.

New resource:

The [Carbon Financing](#) page on the Better Buildings Solution Center contains guidance materials for organizations at any stage of the carbon planning cycle, along with a decision-making tree to select the most appropriate financing approach.

With more people now working from home, the need for increased residential energy efficiency is greater than ever. Unprecedented investment is needed to save money, make homes more comfortable, and improve the health of residents. A renewed focus on residential energy efficiency is demonstrated through the engagement of state and local governments, businesses, utilities, nonprofits, and other stakeholders through the Better Buildings Residential Network. In the past year, the network organized more than 20 Peer Exchange calls with over 1,575 participants that shared innovative strategies and best practices for energy-efficient homes.



Leadership in Action

Program Highlights

570,000+

Energy efficiency upgrades completed by 440+ Better Buildings Residential Network members

Highlights from Better Buildings Residential Network members:

Following record high temperatures in 2021 that reached 116 degrees, the **City of Portland, OR** launched an initiative to develop climate and health standards for existing multi-family buildings that focuses on reducing carbon emissions while improving rental housing to be healthier, more affordable, and resilient to future climate disasters. The city's stakeholder engagement has focused on social inclusion as Black, Indigenous, and people of color are often the communities least responsible for contributing to climate change—yet they are disproportionately affected by its impacts.

CLEAResult achieved more than 393,000 home energy upgrades of single-family home, multifamily, and low-income customers during FY 2021 in 26 states.

The American Council for an Energy-Efficient Economy (ACEEE) released six case studies and an important report concerning Fostering Equity Through Community-Led Clean Energy Strategies. The information presented equitable clean energy policies, programs, and investments in local communities, and discussed the importance of collaboration between local governments and community-based organizations.

1,000,000+

Homes upgraded by Home Performance with ENERGY STAR® Sponsors since 2001

Secretary of Energy Jennifer M. Granholm traveled to Delaware to celebrate the one millionth home upgrade by the DOE Home Performance with ENERGY STAR® program. This national home improvement program administered by DOE in collaboration with the U.S. Environmental Protection Agency (EPA) has saved homeowners more than \$7.7 billion in energy costs, cut carbon emissions equivalent to a year's worth of 11 coal-fired power plants, and generated homegrown green-collar jobs.

- ▶ The DOE Home Energy Score™ (Score) won a 2022 Federal Laboratory Consortium for Technology Transfer Award. The award recognizes a team from DOE's National Laboratories for their work to bolster the Score from a research and development model to a commercially viable software solution. Launched in 2012, the Score provides a reliable, easy-to-understand rating system for home energy usage and makes recommendations for cost-effective improvements.
- ▶ The E3 Initiative addresses better energy, emissions, and equity by the Building Technologies Office that focuses on efficient and clean heating and cooling systems in residential and commercial buildings with the following initiatives:
 - ▶ DOE is working to transform the water heating market and significantly increase the number of high-efficiency, grid-connected heat pump water heaters that use a third of the energy of conventional water heaters.
 - ▶ The Smart Tools for Efficient HVAC Performance (STEP) Campaign works to increase the efficiency of new HVAC system installations and identify malfunctions in existing systems through use of smart diagnostic tools. Space heating and cooling systems account for nearly 45% of energy consumption in U.S. residences, and improper installation and maintenance of HVAC systems leads to increased energy use, unnecessary repairs, and occupant comfort issues.
 - ▶ The Cold Climate Heat Pump Challenge is a collaborative effort with heat pump manufacturers to develop a new technology specification for a high-performance cold climate heat pump, followed by field validation and pilot programs with utilities to address installation challenges and expand market demand.

180,000+

Home Energy Scores™ Completed since 2012

As the nation’s single largest energy consumer, with more than 360,000 buildings and 600,000 vehicles, there is a significant opportunity and responsibility for the Federal Government to cut its energy and water costs. Buildings and facilities represent about 58% of the government’s total energy use, with vehicles and equipment accounting for the remaining 42%. In the most recent period of typical energy use prior to COVID, fiscal year 2019, the Federal Government used 1.3 quads of primary energy at a cost of \$18.4 billion.¹²

The Federal Energy Management Program (FEMP) facilitates savings opportunities and supports agency efforts to be more efficient, resilient, sustainable, and secure by providing access to carbon-free solution sets, tools, training, guidance, and resources that optimize energy and water infrastructure.

FEMP works with its stakeholders to enable Federal agencies to meet energy requirements and provide energy leadership to the country. Executive Order 14057 on catalyzing American clean energy industries and jobs through federal sustainability sets out a range of ambitious goals to deliver an emissions reduction pathway consistent with President Biden's goals, which include:

- ▶ Reducing U.S. greenhouse gas emissions by 50% to 52% from 2005 levels by 2030.
- ▶ Transitioning to 100% zero-emission vehicle acquisitions by 2035 (including 100% light-duty acquisitions by 2027).
- ▶ Achieving net zero emissions buildings by 2045 (including a 50% reduction by 2032), net zero emissions procurement by 2050, and net zero emissions operations by 2050 (including a 65% reduction by 2030).



Leadership in Action

In the past year, FEMP:

Developed the Healthy Buildings Toolkit, with guidance and tools—including the new Healthy Buildings and Energy Support Tool (H-BEST)—to help baseline a federal building’s Indoor Environmental Quality (IEQ) and develop a customized IEQ and energy efficiency cost-benefit analysis to improve building performance.

Delivered foundational Technical Resilience Navigator module training and outreach, to help organizations manage risks to critical missions from disruptions in energy and water services.

Released the online Federal Fleet Requirements Resource Center and the Federal Best Practices: Core Principles of Sustainable Fleet Management report, to help agency fleet managers meet petroleum reduction requirements.

Developed the Energy and Water Audits for Federal Buildings website and Facility Audit Decision Tree, a selection framework to determine the best audit approaches to evaluate federal facilities for energy and water saving opportunities.

Published the PV System Owner's Guide to Identifying, Assessing, and Addressing Weather Vulnerabilities, Risks, and Impacts report, for agencies to identify and correct vulnerabilities of existing PV systems that can result in failures if left unaddressed.

Updated the REopt® web tool—used to optimize distributed energy resources—to evaluate combined heat and power, thermal energy storage, and geothermal heat pumps, along with emissions accounting, campus and electric vehicle load modeling, and off-grid microgrids.

Launched DER-CF, a cybersecurity self-assessment tool for distributed energy resources (DERs), which provides metrics and action items to help agencies identify gaps in their cybersecurity posture.

Promoted the Smart Labs Toolkit to more than 2,000 webinar, conference, and working group participants; the Smart Labs Toolkit was named among the Top 10 toolkits for the Better Buildings Top Solutions of 2020.

Program Highlights

- ▶ Delivered more than **45,000 hours of accredited training** through FEMP’s Training Catalog, webinars, and the annual Energy Exchange technical training workshop, enabling energy and water management professionals to earn **2,500 continuing education units (CEUs)**. New on-demand trainings included Leveraging Utility Partnerships for Fleet Electrification, Monitoring-Based Commissioning in Performance Contracting, an Introduction to Battery Energy Storage, and an innovative Cybersecurity Training Game series.
- ▶ Announced **\$13 million for 17 federal agency projects** under the Assisting Federal Facilities with Energy Conservation Technologies (AFFECT) grant program. The AFFECT grants will leverage more than **\$737 million in performance contracting related investment** with no additional cost to the government to install traditional energy efficiency and innovative resilient energy conservation measures, such as solar PV plus battery energy storage systems with microgrid controls, and electric vehicle supply equipment.

COMMERCIAL

Abbott Northwestern Hospital
adidas
AKSAN United Fortune, Inc.*
Allina Health
American Family Insurance
Anthem, Inc.**
Ascension*
Atlantic Health System
AtSite
Baptist Memorial Hospital Desoto
Beaumont Health System
Berkshire Residential Investments
*Berlin Packaging**
Best Buy*
Bon Secours St. Francis Health System
Briad Wenco*
Brixmor Property Group
Broward Health North
BXP+
Calhoun Management*
Carlisle, LLC*
Catholic Health Initiatives
CBRE
CC Frost Properties, Ltd.
CentraCare Health
Chipotle Mexican Grill
CKE Restaurants Holdings, LLC*
Clarion Partners
Cleveland Clinic**
Coffee & Bagel Brands
Colliers
Columbia Association**
CommonWealth Partners*
Community Services Agency & Development Corporation
Costco Wholesale Corporation
Cotti Foods Corporation*
Cox Enterprises
Cushman and Wakefield
Dacra Development
DaVita+
Defense Health Agency

Delight Restaurant Group*
Denver West
DWS*
Empire State Realty Trust**
Equity One Inc.
First Potomac Realty Trust
Food Lion
Gables Residential
General Services Administration (GSA)
Giant Eagle, Inc.
Glenborough
Guam Memorial Hospital Authority
Gundersen Health System
H&M
Hackensack Meridian Health*
Hamra Enterprises*
Hannaford
Havertys*
Hawaiian Airlines*
Healthcare Realty
HealthSouth
Highwoods Properties*
Hilton Worldwide**
Hines
Hoover Foods*
Hospital Corporation of America
Howard Hughes Corporation
Hudson Pacific Properties
Hyatt Hotels Corporation
IBM
IHG Hotels & Resorts
IKEA Retail U.S.+
Inova Health System
JAE Restaurant Group*
Jamestown**
JBG Smith*
JCPenney
Jones Lang LaSalle
Kaiser Permanente
Kessinger/Hunter & Co.
Kilroy Realty*
Kimco Realty Corporation
Kohl's, Inc.**

Las Vegas Sands Corporation*
LaSalle Investment Management+
LBA Realty*
Legacy Health
Legacy Vacation Resorts+
Lendlease**
Liberty Property Trust
Life Time, Inc.*
Lincoln Harris
Link Logistics+
Living City Block
Loews Hotels & Co.*
Lowe's
Lush Cosmetics
Luxottica North America
Macy's*
Marriott International
Mayo Clinic
MC Realty
McDonald's Corp.
Mesa Lane Partners, LLC
MetLife Investment Management**
MGM Resorts International**
Montefiore Medical Center*
Mountain West Wendy's*
Neema Hospitality
Newmark
NewYork-Presbyterian Hospital*
Nike*
North Shore-Long Island Jewish Health System
Nuveen*
Oregon Health & Science University
*Paramount Pictures**
Parkland Health & Hospital System
Parkway Properties*
Parmenter Realty Partners
PGIM (formerly Prudential Financial)
Physicians Realty Trust*
PNC Financial Services Group*
Primary Aim, LLC*
Principal Real Estate Investors
Prologis
Promar Corporation*

Providence Health & Services
Publix
Qurate Retail Group*
Regency Centers
Regions Bank
REI
Related Companies
Retail Properties of America
Ryan Companies US, Inc.
Saunders Hotel Group*
Shari's Cafe & Pies*
Sharpe Properties Group, LLC
Sheetz, Inc.*
Shorenstein Properties, LLC*
Southwestern Vermont Health Care
Staples*
Starbucks Coffee Company*
Stream Realty Partners, L.P.
Studley
Summa Health System
Tar Heel Capital*
Target Corporation
The Hartford Financial Services Group, Inc.*
The Home Depot
The Kessler Collection
The Malcolm Bryant Corp.
The Paradigm Group*
The Tower Companies**
The Walt Disney Co.
The Wendy's Company*
The Westfield Group
Tishman Speyer
T-Mobile*
Transwestern
Travel + Leisure Co.*
Twin Coast Enterprises*
U.S. Department of Veterans Affairs (VA)
U.S. Navy CNIC Facilities and Acquisitions
U.S. Space and Rocket Center
Ulta Beauty, Inc.
University of Maryland Medical Center (UMMC)*

University of Nebraska Medical Center (UNMC)*
University of Pittsburgh Medical Center (UPMC)*
University of South Alabama Medical Center
University of Utah Health Care
USAA Real Estate*
UW Health**
Ventas
Veterans Health Administration
Vornado
Walgreens*
WashREIT*
Welltower
Wendium of Florida, Inc.*
Wend-Rockies, Inc*
Wen-GAP, LLC*
WenMarr Management Company, LLC*
Westchester Medical Center
Whole Foods Market*
Wyndham Hotels and Resorts
Yum! Brands

DATA CENTERS

Iron Mountain Data Centers*
QTS Data Centers+
Sabey Data Center Properties**

EDUCATION

Alachua County Public Schools, FL*
Albuquerque Public Schools, NM*
Allegheny College*
Anne Arundel County Public Schools, MD*
Arizona State University
Aurora Public Schools, CO*
Bard College**
Boulder Valley School District, CO
Bullitt County Public Schools, KY*
California State University, Sacramento+
Camas School District, WA*
Carleton College
Case Western Reserve University

Catholic University of America*
Chesapeake College*
*Chicago Public Schools**
Clark Atlanta University
Colorado State University+
Community College of Allegheny County*
Cornell University
CUNY: The City University of New York
Douglas County School District, NV*
Duke University
Dysart Unified School District 89, AZ*
Emory University
Fairfax County Public Schools, VA*
Florida A&M*
Fort Worth Independent School District, TX*
Grand Valley State University
Hillsboro School District, OR*
Indianapolis Public Schools, IN*
Lane Community College
Los Angeles Unified School District, CA**
Loyola University
Madison City Schools, AL*
Manchester School District, NH*
Massachusetts Institute of Technology
Medical School University of Miami
Michigan State University*
Morehouse College*
Northwestern University*
Pace University**
Parkway School District, MO*
Pasadena Independent School District, TX*

KEY

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

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
Sewanee: The University of the South*
Simpson College
Stanford University
Stevens Institute of Technology*
Towson University*
Tulane University
University of California, Berkeley*
University of California, Davis
University of California, Irvine*
University of California, Merced
University of Chicago⁺
University of Colorado Boulder
University of Hawaii at Manoa
University of Maryland
University of Massachusetts
University of Michigan⁺
University of South Carolina
University of Tulsa*
University of Utah*
University of Virginia**
University of Wisconsin
Washington College*
Washington University in St. Louis*
Washtenaw Community College
Xenia Community Schools, OH*

FINANCIAL ALLIES

Abundant Power Group*
Advantage Energy Capital Partners, LLC*
AFL-CIO Housing Investment Trust*
All American Investment Group*
Allumia*
Alturus*
Bank of America*
BioStar Renewables*
*BlocPower**
Blue Hill Partners LLC*
BlueFlame Energy Finance*
Bostonia Partners LLC*
*Budderfly**
Byline Financial Group*
Centrica Business Solutions*
Citi*
Citizen Energy*
CleanFund LLC*
Commercial Power Partners, LLC*
Community Investment Corporation*
Connecticut Green Bank*
*Counterpointe Sustainable Real Estate**
EDF Renewable Energy*
eMaxx*
Enhanced Capital*
Enterprise Community Partners*
Flywheel*
Hannon Armstrong*
The Hartford Steam Boiler Inspection and Insurance Co.*
Hawaii Green Infrastructure Authority*
Imperial Ridge Real Estate Capital (Formerly Lever Real Estate Capital)
*Kyotherm**
LISC*
Low Income Investment Fund*
Metrus Energy*
Minimise
New York City Energy Efficiency Corporation*

Nuveen Green Capital (Formerly Greenworks Lending)*
Onsite Utility Services Capital*
PACE Equity*
Petros PACE Finance LLC*
Redaptive*
Renew Energy Partners*
Renew Financial*
Samas Capital*
*Skyven Technologies**
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.
Acuity Brands, Inc.
Agropur
Ahlstrom-Munksjö
Alcoa*
Alexandria Renew Enterprises*
Alumalloy Metal Casting Company
Amcors Rigid Plastics
American MITSUBA Corporation
Archer Daniels Midland
Armstrong Flooring, Inc
Asama Coldwater Manufacturing
AstraZeneca
AT&T
*Autodie LLC**
Autoliv
Avon Lake Regional Water
Ball Corporation
BD*
Bendix Commercial Vehicle Systems⁺
Bentley Mills*
BillerudKorsnäs
Boardman Foods
*BorgWarner***
Bosch Rexroth Corporation
BPM, Inc. (Badger Paper Mills, Inc.)
Bradken
*Brewery Vivant***
Bridgestone Americas, Inc.
Briggs & Stratton*
Bristol-Myers Squibb*
Brose North America
Bucks County Water & Sewer Authority*
C. F. Martin & Co., Inc. (Martin Guitar)*
California Portland Cement Company (d.b.a. CalPortland)
Campbell Soup Company
Cardington Yutaka Technologies, Inc.*
Carlton Forge Works
Cascade Engineering Technologies, Inc.
Caterpillar, Inc.
Celanese Corporation*
Chapco Inc.
Charter Steel
The Chemours Company⁺
Chippewa Valley Ethanol Company
City of Charleston Water System
City of Grand Rapids Water Resource Recovery Facility**
City of Phoenix Water Services Department
City of Roseville, Environmental Utilities Department
Clearwater Engineering, Inc.
*Cleveland Cliffs Inc.**
*Coca-Cola Consolidated**
CoilPlus, Inc.
Colgate-Palmolive Company
Comau Inc.
Commercial Metals Company
Commercial Vehicle Group
Connector Castings, Inc.
Cooper Standard

Co-Operative Industries
Aerospace & Defense
Cummins Inc.**
Custom Glass Solutions
Daikin Applied Americas, Inc.
Danaher Corporation
Delta Diablo
Denison Industries
DENSO Corporation
Des Moines Water Works*
Deschutes Brewery⁺
Detroit Diesel Corporation
Didion Milling
Dixline Corporation
Donsco Inc.
Dow Chemical
DSM North America⁺
Durable Products, Inc.
Dura-Line Corporation
Durex Inc.
E&L Construction Group, Inc.
Earth2O (d.b.a. The Sweetwater Company Inc)
East Penn Manufacturing Co.
Eastman Chemical Company**
Eaton Corporation
Eck Industries
Electrolux**
Encina Wastewater Authority*
EnerSys
Entegris
The Estée Lauder Companies
Flambeau River Papers
FLEXCO Corporation
Flowers Foods
FMC Corporation
Ford Motor Company**
Fort Wayne City Utilities - City of Fort Wayne
GB Manufacturing
General Aluminum Manufacturing Company
General Dynamics Ordnance and Tactical Systems
General Electric**

General Mills*
General Motors**
General Stamping & Metalworking
Gibraltar Industries
GKN Aerospace Services Structures
Golden Renewable Energy, LLC
Goodyear Tire & Rubber Company
Graham Packaging
Graphic Packaging International
HARBEC*
Harley-Davidson Motor Company⁺
Harrison Steel Castings Co.
Harva Company
Haynes International
Hershey
Hewlett Packard Enterprise⁺
HNI Corporation⁺
Holingsworth & Vose
Honda North America
Honeywell⁺
Huntsman Corporation
IAC Group
Imerys Performance Minerals
Ingersoll Rand**
Ingevity
International Paper Company⁺
Intertape Polymer Group
Intralox LLC
Isringhausen, Inc (ISRI)
J.R. Simplot Company*
JBT Corporation
Jedco, Inc.
Johnson & Johnson⁺
Johnson Controls**

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Johnson Matthey
Kent County Levy Court
Kenworth Truck Company
Kingspan Insulated Panels, Inc.⁺
Krage Manufacturing
KYB Americas Corporation⁺
Lafarge-Holcim^{*}
Land O'Lakes
Lear Corporation⁺
Leggett & Platt, Incorporated
Legrand North and Central America^{**}
Lennox International^{*}
Lineage Logistics^{*}
Lockheed Martin^{*}
Lopez-Dorada Foods⁺
L'Oréal USA^{*}
Los Angeles Bureau of Sanitation
Los Angeles Department of Water and Power^{**}
Lundberg Family Farms⁺
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.
McWane, Inc.^{*}
MEKRA Lang North America
Metal Industries, Inc.
Miami-Dade Water and Sewer Department⁺
Michels Corporation
Mitsubishi Electric Automotive America
Mohawk Industries
Mulgrew Aircraft Components, Inc.
Narragansett Bay Commission
Navistar Inc.
ND Paper Inc.
Neenah Foundry
Nestlé⁺

NEW Water (Green Bay Metropolitan Sewerage District)^{*}
Newman Technology
Nissan North America^{**}
NORPAC
Novelis
NSK Americas
NYC DEP - Bureau of Wastewater Treatment
Occidental Chemical Corporation
O'Fallon Casting
OFD Foods
Orange Water and Sewer Authority^{*}
Oshkosh Corporation
Osram Sylvania
Owens Corning^{*}
Ozinga Brothers, Inc.
Pactiv
PaperWorks Industries
Parker Hannifin
Patrick Cudahy
PepsiCo
Perrone Aerospace
Pharmavite^{*}
Philadelphia Water Department
Pima County Regional Wastewater Reclamation Department
Plastics Engineering Company (Plenco)
PPC Broadband
PPG Industries
Procter & Gamble
Quad/Graphics, Inc.
Raytheon Technologies
Research Electro-Optics
Richmond Industries Inc.
RING Container Technologies
Roche Diagnostics Operations
Rowley Spring and Stamping
Saint-Gobain Corporation^{**}
Saputo Dairy Foods USA
Savage Precision Fabrication
Schneider Electric^{**}
Sears Seating
Selmet, Inc.

Shape Corp
Shaw Industries Group, Inc.
Sheboygan Regional Wastewater Treatment Facility
Sherwin-Williams^{*}
Siemens⁺
Silgan Closures
Silgan Containers
Silgan Plastic Food Containers
Skorpios Technologies
SL Corporation
Solberg Manufacturing Inc.^{*}
Southwest Cheese
Spirax Sarco, Inc.
St. Petersburg Water Resources Department
Stanley Black & Decker⁺
Stanley Spring and Stamping
Steelcase, Inc.^{**}
Stellantis
Stryker⁺
Sugar Creek Packing Co.
SunOpta, Inc.
Synthomer⁺
Tarkett USA Inc.⁺
TE Connectivity^{*}
Tenaris
Texas Instruments
Texas Nameplate Co.
Textron, Inc
Thermo Fisher Scientific^{*}
TitanX Engine Cooling, Inc.
TK Elevator
Toyota Motor North America^{**}
TPC Group LLC
TRAM Group
Trane Technologies^{**}
Tri-State Plastics, Inc.
Tyson Foods
United Mechanical and Metal Fabricators (U-MEC)⁺
Valmont Industries
Valvoline Inc
Vanguard Space Technologies

Vermeer Corporation
Verso Corporation
Victor Valley Wastewater Reclamation Authority^{*}
Vitro Architectural Glass
Volvo Group North America^{**}
W. L. Gore and Associates
Waupaca Foundry, Inc.⁺
Weber Metals Inc.
Western Lake Superior Sanitary District
West Lafayette Water Resource Recovery Facility
Westrock
Weyerhaeuser WP
Whirlpool Corporation⁺
Xerox^{**}
Zebra Technologies^{**}
Zimmer Biomet

MULTIFAMILY

2Life Communities^{*}
ACTION-Housing Inc.^{*}
Aeon^{*}
Arizona Housing Inc.⁺
Atlanta Housing Authority^{*}
Beacon Communities^{*}
Boston Housing Authority^{*}
Boulder Housing Partners^{*}
Bozzuto Management Company^{*}
BRIDGE Housing Corporation^{*}
Cambridge, MA Housing Authority^{*}
Caritas Communities, Inc.^{*}
Cascap, Inc.^{*}
Century Housing^{*}
Codman Square Neighborhood Development Corporation^{*}
CommonBond Communities^{*}
The Community Builders, Inc.^{*}
Community Housing Partners^{**}
Community Roots Housing^{*}
Corcoran Management^{*}
Cuyahoga Metropolitan Housing Authority^{*}
Danville Development^{*}
District of Columbia Housing Authority^{*}

EAH Housing, Inc.^{*}
East Bay Asian Local Development Corporation^{*}
Eden Housing^{*}
Fort Wayne Housing Authority^{*}
Foundation Communities^{**}
FS Energy^{*}
Gary Housing Authority^{*}
Gateway Management Services, LLC^{*}
High Desert Housing^{*}
Homeowner's Rehab Inc.⁺
Homes for America^{*}
Housing Authority City of Pittsburgh^{*}
Housing Authority of Baltimore City^{*}
Housing Authority of City of Bristol, CT^{*}
Housing Authority of City of Helena, MT^{*}
Housing Authority of City of Palatka, FL^{*}
Housing Authority of City of San Buenaventura, CA^{*}
Housing Authority of Knox County, IN^{*}
Houston Housing Authority^{*}
Human Good^{*}
Jamaica Plain Neighborhood Development Corporation^{*}
Jersey City, NJ Housing Authority^{*}
Jonathan Rose Companies^{*}
Keene Housing^{*}
Kier Property Management^{*}
King County Housing Authority^{**}
LINC Housing Corporation^{*}
Maloney Properties^{*}
Manhattan Housing Authority^{*}
Mercy Housing, Inc.^{*}
Michigan City Housing Authority^{*}
Minneapolis Public Housing Authority^{*}
National Church Residences^{*}
New Bedford Housing Authority^{*}
New York City Housing Authority^{*}
NHP Foundation^{*}
NHT Communities^{*}
Peabody Properties, Inc.^{*}
Philadelphia Housing Authority^{*}
Preservation of Affordable Housing^{*}
Puerto Rico Public Housing Administration^{*}

REACH CDC^{*}
Retirement Housing Foundation^{*}
Riseboro Community Partnership^{*}
Rockford Housing Authority^{*}
Rural Ulster Preservation Company^{*}
San Antonio Housing Authority^{*}
Satellite Affordable Housing Associates^{*}
Schochet Companies^{**}
Seattle, WA Housing Authority⁺
Standard Communities^{**}
Stewards of Affordable Housing for the Future⁺
Tampa Housing Authority^{*}
Tenderloin Neighborhood Development Corporation^{**}
The Economic Development Authority of the City of Mankato, MN^{*}
The Evangelical Lutheran Good Samaritan Society^{*}
The Housing Authority of the City and County of Denver^{*}
The Renaissance Collaborative^{*}
The Silver Street Group and Housing Management Resources, Inc.^{*}
Trinity Management^{*}
Truth or Consequences Housing Authority^{*}
Village of Hempstead Housing Authority^{*}
Vistula Management Company^{*}
Volunteers of America^{*}
Wesley Living^{*}
Windsor Locks Housing Authority^{*}
WinnCompanies^{*}
Wishrock Investment Group^{*}
Yolo County, CA Housing Authority^{*}

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STATE AND LOCAL

Albany County, NY⁺
Alexandria, VA^{*}
Arlington County, VA^{*}
Arvada, CO^{*}
Atlanta, GA^{*}
Austin Water
Bayfield County, WI
Boston, MA^{*}
Burlington, VT
Charlton, MA
Chattanooga, TN^{*}
Chicago, IL^{*}
Chula Vista, CA⁺⁺
Citizens Energy Group
Clark County, NV^{*}
Cleveland, OH^{*}
Columbia, MO^{*}
Cook County, IL^{*}
Dallas, TX⁺
DC Water
Delaware^{*}
Denver, CO^{*}
District of Columbia^{*}
East Bay Municipal Utility District
El Paso, TX^{*}
Fairfax County, VA⁺
Fort Lauderdale, FL^{*}
Fort Worth, TX^{*}
Georgia
Glenbard, IL
Glens Falls, NY⁺⁺
Grand Rapids, MI
Gwinnett County, GA
Hall County, GA^{*}
Hampton Roads Sanitation District
Hawaii
Hillsboro, OR⁺⁺
Houston, TX^{*}
Huntington, NY^{*}
Illinois
Kauai County, HI^{*}
Ketchum, ID

King County, WA^{*}
Knoxville, TN^{}**
La Crosse, WI⁺
Little Rock Water Reclamation Authority
Longmont, CO
Los Angeles, CA^{*}
Loudoun Water
Louisiana
Louisville, KY⁺
Lowell, MA
Madison, WI⁺
Maine
Manchester, NH^{*}
Margate, FL^{*}
Maryland^{}**
Massachusetts^{*}
Michigan
Michigan City, IN
Milwaukee, WI^{*}
Minnesota^{*}
Mississippi
Missouri
Montana
Moscow, ID
Nevada
New Mexico
Norfolk, VA^{}*
North Carolina^{*}
Ohio
Orange County, FL^{}*
Oregon
Orlando, FL^{}**
Pennsylvania
Philadelphia, PA⁺⁺
Pittsburgh, PA^{*}
Placer County, CA^{*}
Racine, WI
Reno, NV^{*}
Rhode Island^{*}
Roanoke, VA^{}**
Rochester, NY^{*}
Salt Lake City, UT^{*}
San Diego, CA⁺

San Luis Obispo, CA
Santa Fe, NM^{*}
Seattle, WA^{*}
Silicon Valley Clean Water
South Burlington, VT
South Carolina
South Dakota
Southampton, NY⁺
Telluride, CO
Tennessee
Texas
Village of Montour Falls, NY⁺
Washington
West Palm Beach, FL^{*}
West Virginia
Will County, IL^{*}
Wisconsin
Worcester, MA⁺⁺

UTILITY

AB Energy - New Jersey
AEP Ohio
Austin Water
AVANGRID⁺
Baltimore Gas & Electric
Commonwealth Edison
Consolidated Edison
D.C. Sustainable Energy Utility (DCSEU)
DTE Energy
Exelon Corporation⁺
GE Distributed Power
Highland West Energy
Kraft Power Corporation
MacAllister Power Systems
Martin Energy Group
National Grid
Nicor Gas
Northeast-Western Energy Systems
One Gas
Peoples Natural Gas
Philadelphia Gas Works
PSEG Long Island
Silicon Valley Clean Water

PROGRAM AFFILIATES

2G Energy Inc.
American Association of Blacks in Energy & Jonah Cooper LLC
American Hotel & Lodging Association
American Institute of Architects
American Society for Healthcare Engineering
American Society of Heating, Refrigerating, and Air-Conditioning Engineers
APPA - Leadership in Educational Facilities
Asian American Hotel Owners Association
Association for the Advancement of Sustainability in Higher Education
Association of Energy Engineers
Auburn University Rural Studio
Biomass Thermal Energy Council
Building Owners and Managers Association International
Building Performance Association
Building Performance Institute
Capstone Turbine Corporation
CMTA, Inc.
Coalfield Development
Confluence Communications
ConnexFM
Corporate Sustainability Strategies
CPL Architects and Engineers
Cunningham Group Architecture
Dalkia Aegis, EDF Group
DataBased+
Earth Advantage
Elevate Energy
Emerald Cities Collaborative
Energy and Environmental Building Alliance
Environmental Defense Fund
Franklin Energy Services LLC
GEM Energy, LLC
Green Building Alliance
Green Parking Council
Green Sports Alliance
Greenwork
Health Care Without Harm

HGA
Home Builders Institute
Homes.com
IDeAs Consulting
Illuminating Engineering Society of North America
IMEG Corp
Institute for Market Transformation
Integral Group
International Facility Management Association
International Union of Painters and Allied Trades (IUPAT)
Interstate Renewable Energy Council
Jacobs
Leddy Maytum Stacy Architects
Little Rock Water Reclamation Authority
Local Governments for Sustainability (ICLEI)
MCI
Moody Nolan
NACUBO
NAIOP (Commercial Real Estate Development Association)
National Alliance of Forest Owners (NAFO)
National Apartment Association
National Association of Real Estate Brokers (NAREB)
National Association of Real Estate Investment Trusts
National Association of REALTORS®
National Association of State Energy Officials
National Association of Women in Construction
National Co-op Grocers
National Multifamily Housing Council
National Society of Black Engineers
Network for a Sustainable Tomorrow
New Buildings Institute
New Jersey Clean Energy Program (TRC Solutions)
New York State Energy Research and Development Authority
North America's Building Trades Unions
North American Sustainable Refrigeration Council
Northeast Energy Efficiency Partnerships
Northwest Energy Efficiency Council
P2S Inc.
PAE Engineers
Pension Real Estate Association
Practice Greenhealth
Real Estate Research Institute (RERI)
Retail Industry Leaders Association
Rewiring America
Roof Coatings Manufacturers Association
Roxbury Community College
Second Nature
Slipstream
Smart Energy Decisions
SmithGroup
SOM
Sterling & Wilson Cogen Solutions, LLC
Stewart and Stevenson Power Product LLC, Atlantic Division
Strategic Energy Innovations
Sustainable Endowments Institute
The Corps Network
The Real Estate Roundtable
The Solar Foundation - Puerto Rico
U.S. Green Building Council
Unison Energy, LLC
Urban Green Council
Urban Land Institute
Veterans Health Administration (VHA) Energy Engineer Advisory Board
Vizient Vote Solar

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