11 Greenprint Performance Report™

VOLUME 11

Urban Land Institute

Greenprint

Contents

Introductory Letter

Since 2009, ULI Greenprint has been a leading source of collaboration among real estate leaders over a shared mission to reduce carbon emissions and increase building value across portfolios. This year is no exception, with 2019 performance driving further advancements and innovations on sustainability in the built environment.

We are pleased to share that from 2018 to 2019 Greenprint members collectively showed continued reductions in year-over-year carbon emissions, energy and water consumption, and landfill waste. In total, the portfolio reduced carbon emissions by 3.1 percent, continuing on the collective path to achieve the Greenprint goal of 50 percent carbon reductions by 2030 (with a 2009 baseline). Greenprint members continued to lead the market with over 6,000 sustainability projects implemented and more than 400 buildings achieving green certifications in 2019.

An economic analysis of Greenprint's triple-bottom-line impact amounts to over US$687 million (€579 million) since 2009. This includes financial savings from energy and water use reductions, as well as the environmental value of carbon emissions reductions and the social value of air pollution and water. In total, this represents a reduction of 1.434 million tons of CO_2 emissions from Greenprint members' properties.

Today, Greenprint is proud to have its largest membership to date, encompassing the following:

US$1.18 trillion (€1.0 trillion)
IN REAL ESTATE ASSETS UNDER MANAGEMENT

10,190 PROPERTIES
IN THE GREENPRINT PORTFOLIO

2.37 BILLION FT^2
(220 MILLION M^2)

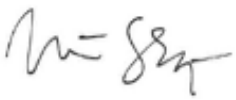
32 COUNTRIES
REPRESENTED IN THE PORTFOLIO

The market today values environmental, social, and governance (ESG) in real estate more than ever before. ESG now includes everything from energy efficiency and health and well-being to social equity, resilience, and embodied carbon. Owners, investors, occupants, cities, and communities all find value in green buildings. Never has the urgency to act in addressing climate change in the built environment been so strong.

Unprecedented events in 2020 have brought new sustainability challenges to the space. This has driven actions to improve coordination between energy efficiency and health and well-being in response to the coronavirus pandemic and for thoughtful progress on diversity and inclusion to address real estate's historic role in furthering racial inequity. ESG now encompasses so much more than high-performance buildings, and Greenprint sustainability leads have found themselves involved in additional activities, such as optimizing empty office buildings, developing health and safety plans for building reentry, and supporting social equity initiatives portfolio-wide.

The current moment requires us to be steadfast in the pursuit of a future that is more equitable, healthy, green, and resilient. As real estate companies set meaningful carbon reduction targets, cities pass bold climate mitigation policies, and tenants demand sustainable spaces, Greenprint is poised to rise to the challenge and support its members as they lead the industry on reducing carbon and increasing building value.

Signed,



Marta Schantz, Senior Vice President, ULI Greenprint

The Greenprint Community

"Greenprint represents an essential element in the toolkit for institutional investors such as those represented by my firm in measuring progress in reducing the environmental impact of the properties they own. The thesis that you can't reduce it if you can't measure it is applicable to the work done so well by Greenprint and its real estate members. While COVID-19 has often knocked climate change and climate risk out of the headlines in recent months, the talented staff at Greenprint and the Center for Sustainability and Economic Performance have continued to work with industry leaders to identify best practices that can help us achieve the goal of a net zero future."

—Mary Ludgin, senior managing director and director of global investment research at Heitman, and incoming chair of ULI's Center for Sustainability and Economic Performance

Real Estate Members

A global community of real estate owners, investors, and developers committed to leading the market and advancing sustainability across their portfolios:

The Greenprint Community (CONT.)

Innovation Partners

Technology and service providers who contribute innovative best practices that advance sustainability with Greenprint members and in the built environment broadly:

Autocase

BLACK BEAR ENERGY

CARBON LIGHTHOUSE

Nova Group

SIEMENS

Transparent Energy
powering your decisions

WoodWorks

Strategic Partners

Industry actors who engage with Greenprint and its members in the market on topics of relevance to Greenprint's mission of reducing carbon emissions and increasing building value:

BBP BETTER BUILDINGS PARTNERSHIP

Better Buildings
U.S. DEPARTMENT OF ENERGY

BOMA International

(CHSB) Cornell Hotel
SUSTAINABILITY BENCHMARKING INDEX

CRREM

ENERGY STAR

Global Alliance for Buildings and Construction

goby
The ESG Platform

GRESB

INTERNATIONAL LIVING FUTURE INSTITUTE

THE KRESGE FOUNDATION

MEASURABL

UNEP

USDN
urban sustainability directors network

Robert Wood Johnson Foundation

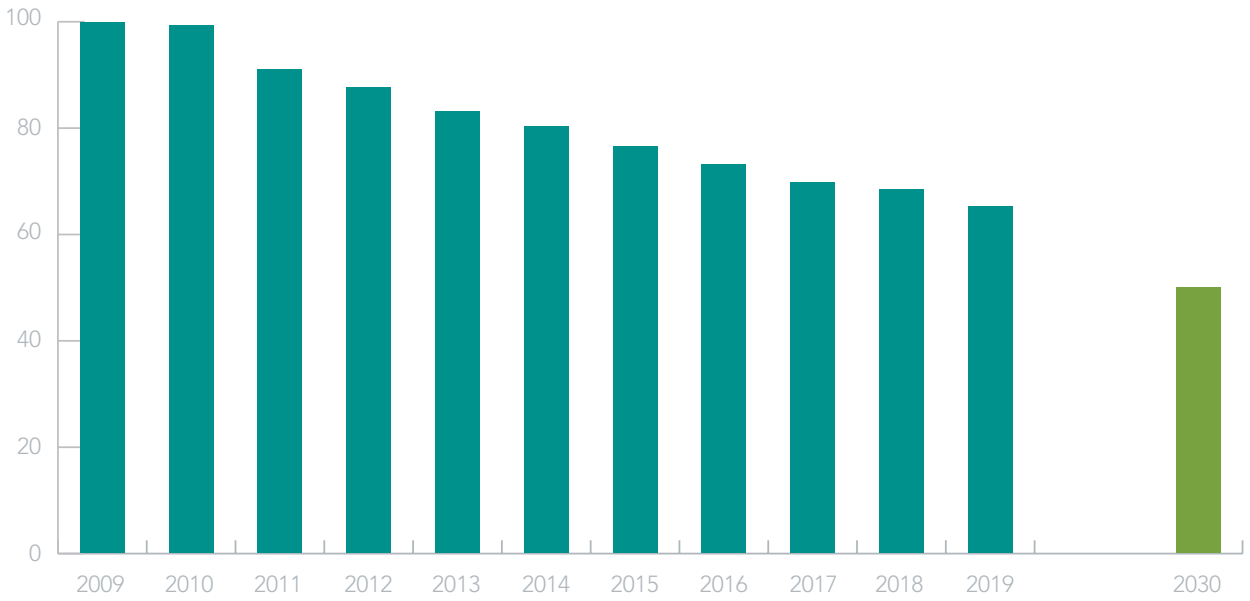
ROCKY MOUNTAIN INSTITUTE

Long-Term Results: 2009 to 2019

Greenprint's mission is to lead the global real estate community toward value-enhancing carbon reduction strategies. Since inception, the member portfolio continues to reduce its collective emissions over time, on track to meet Greenprint's goal of 50 percent reduction by 2030. These efforts support global greenhouse gas stabilization by 2030 in line with the goals of the Intergovernmental Panel on Climate Change.

Since 2009, Greenprint properties have also improved their overall energy use intensity (EUI), reducing the median EUI of office properties in the United States from over 220 kWh/m^2 to 182 kWh/m^2, a 17 percent decrease. The most recent year-over-year performance shows an improvement of 3.1 percent reduction in carbon emissions.

GREENPRINT CARBON REDUCTIONS OVER TIME (PERCENTAGE)



Autocase, a Greenprint Innovation Partner, conducted a 10-year impact analysis for energy, water, and carbon savings for the Greenprint portfolio from 2009 through 2019. The firm uses cost/benefit analyses for translating effects into triple-bottom-line metrics, calculating the oft-desired "social" return on investment for a project. The resulting analysis includes actual financial savings value combined with estimated environmental value to calculate the total Greenprint impact to date.

GREENPRINT 10-YEAR IMPACT ANALYSIS (2019 US$)		
CATEGORY	**IMPACT TYPE**	**TOTAL VALUE**
FINANCIAL	FINANCIAL SAVINGS FROM ELECTRICITY	$259,134,900
FINANCIAL	FINANCIAL SAVINGS FROM WATER	$26,423,483
ENVIRONMENTAL	CARBON EMISSIONS	$61,362,441
ENVIRONMENTAL	SOCIAL VALUE OF AIR POLLUTION	$336,995,780
ENVIRONMENTAL	SOCIAL VALUE OF WATER	$3,170,718
	FINANCIAL SUBTOTAL	**$285,558,383**
	ENVIRONMENTAL SUBTOTAL	**$401,528,939**
	TRIPLE-BOTTOM-LINE TOTAL	**$687,087,322**

Annual Results: 2018–2019

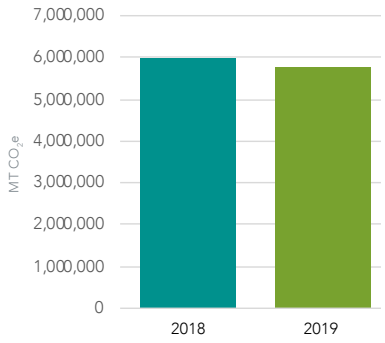
2018–2019 Year-over-Year Performance

Greenprint members' buildings across the globe collectively continue to reduce energy and water use, waste generation, and carbon emissions year over year, as shown in the following figures.

GREENPRINT PERFORMANCE SNAPSHOT: CHANGE, 2018 TO 2019

CO_2 EMISSIONS

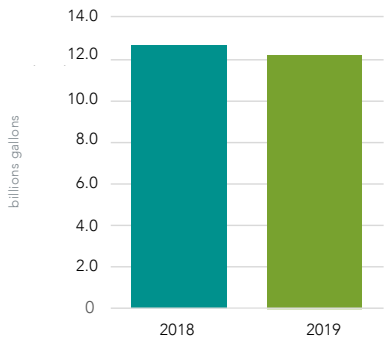
⇩ –3.1%



2,823 PROPERTIES

WATER CONSUMPTION

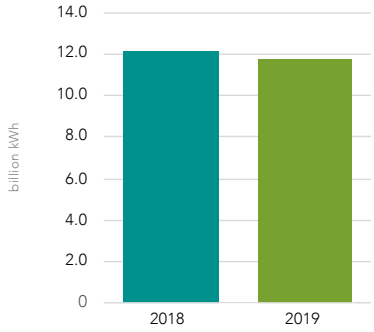
⇩ –3.3%



2,358 PROPERTIES

ENERGY CONSUMPTION

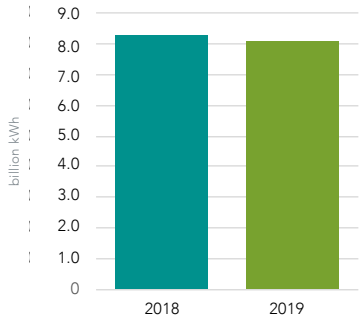
⇩ –2.7%



3,098 PROPERTIES

ELECTRICITY USE

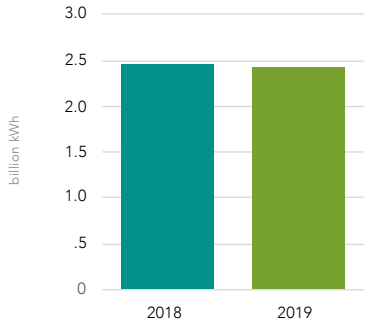
⇩ –2.3%



3,098 PROPERTIES

NATURAL GAS USE

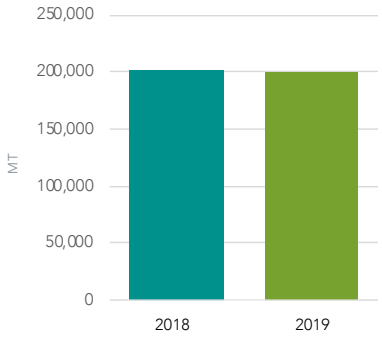
⇩ –1.3%



1,381 PROPERTIES

LANDFILL WASTE

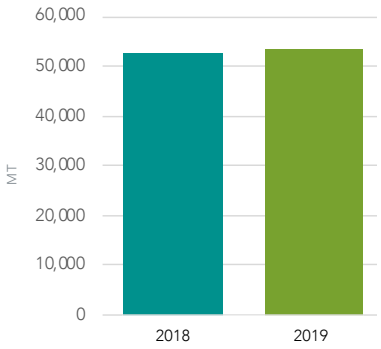
⇩ –0.9%



1,062 PROPERTIES

WASTE DIVERSION

⇧ 1.6%



468 PROPERTIES

2019 Sustainability Project Breakout

Greenprint members continue to reduce carbon emissions by implementing energy efficiency improvements, waste reduction strategies, water efficiency measures, and renewable energy innovations. In total, Greenprint members reported 6,122 sustainability projects in 2019; the 2,642 projects that reported cost data totaled over US$51.0 million in investment. Energy efficiency projects remain a top priority for many Greenprint members, who completed a total 3,971 projects in 2019.

3,971	Energy	**$47,700,324**
1,182	Waste	**$246,104**
875	Water	**$2,494,944**
94	Carbon	**$526,760**

*Not all Greenprint reported projects included cost data; as such, the project-related cost numbers in this report under-represent total investments.

2019 Green Building Certification Breakout

Green building certification standards provide guidelines to design efficient buildings, reduce operating expenses, and increase on-site opportunities for energy efficiency, water conservation, waste reduction and recycling, healthy materials, green transportation, resilience, and health and wellness.

Across the Greenprint portfolio, office properties continue to report the highest number of newly certified spaces, followed by industrial. The demand for green certifications in both new developments and existing buildings continues to grow as tenants recognize the potential for lower utility costs and more productive employees and as investors desire consistency in tracking sustainability of assets across funds.

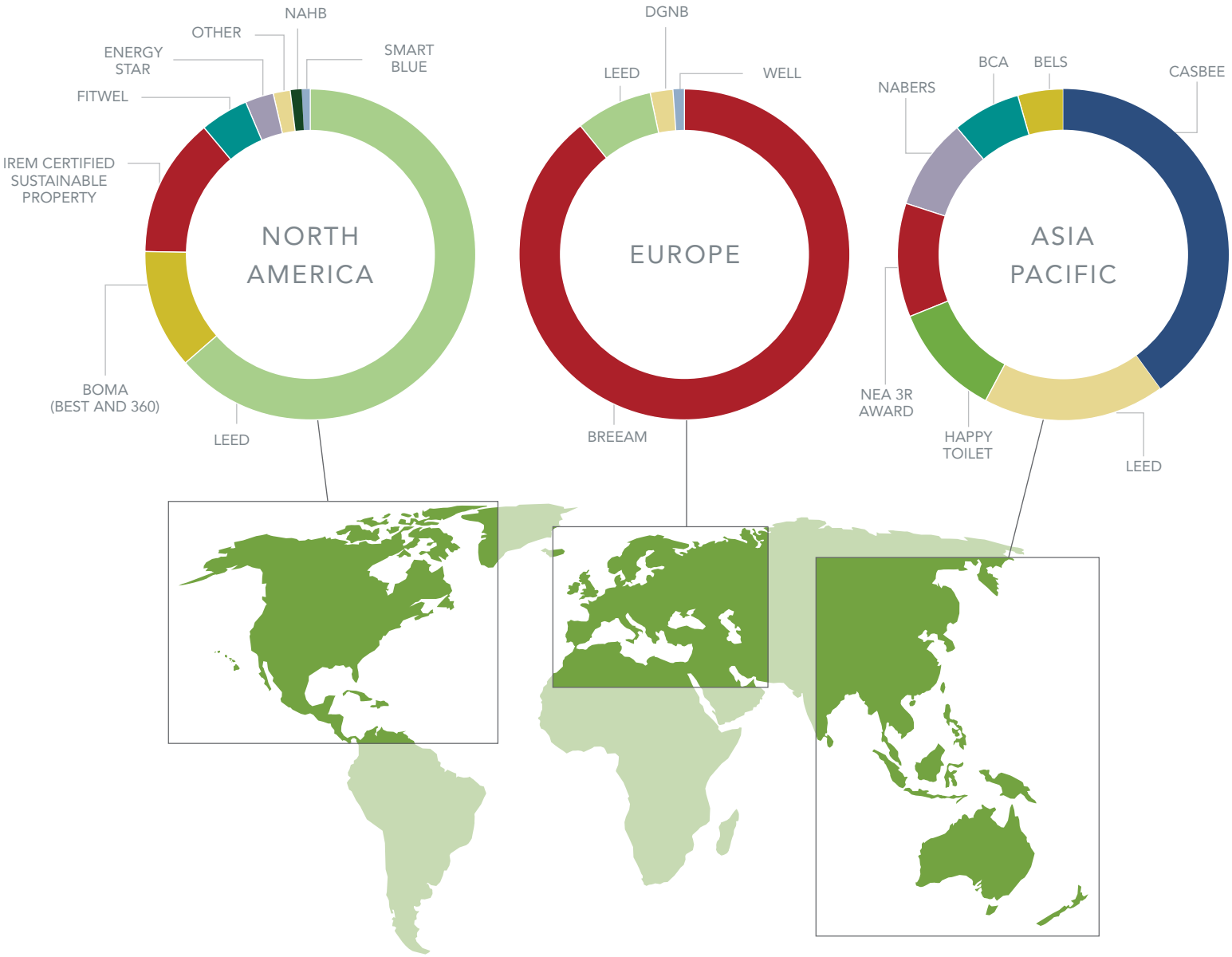
PROPERTY TYPE	CERTIFICATION COUNT	REPORTED AREA COVERAGE (M^2)
OFFICE	209	4,662,949
INDUSTRIAL	129	4,023,694
MULTIFAMILY	53	1,438,509
RETAIL	31	1,253,439
OTHER	3	51,686
SELF-STORAGE	3	3,142
HOTEL	1	35,424

Because many major markets now require new developments to achieve a certain level of green certification through building codes or encourage improvements through incentive offerings, the real estate industry will continue to see increases in green-certified spaces over time.

In 2019, Greenprint members reported achieving 429 green building certifications or recertifications across 18 countries. North American properties achieved the most diverse group of certifications. Different regions vary in their most common certifications, with the Comprehensive Assessment System for Built Environment Efficiency (CASBEE) from Japan being the most common in the Asia Pacific region, LEED (Leadership in Energy and Environmental Design) continuing to be the most common in North America, and the Building Research Establishment Environmental Assessment Method (BREEAM) remaining the most common in Europe.

Building certifications focused on health and well-being, like the Center for Active Design's Fitwel program and the International Well Building Standards' WELL certification, remained popular in 2019 with a combined 13 total certifications (3 percent of all certifications). With the coronavirus pandemic accelerating owner, investor, and occupant interest in health and well-being in the built environment, the number of new Fitwel and WELL-certified properties is expected to grow over the coming years.

2019 GREEN BUILDING CERTIFICATIONS ACHIEVED, BY REGION AND COUNT



Carbon

As the world of real estate sustainability becomes more sophisticated and the need for buildings to reach net-zero carbon by 2050 becomes increasingly clear, the market is beginning to shift its focus beyond energy reductions to decarbonization.

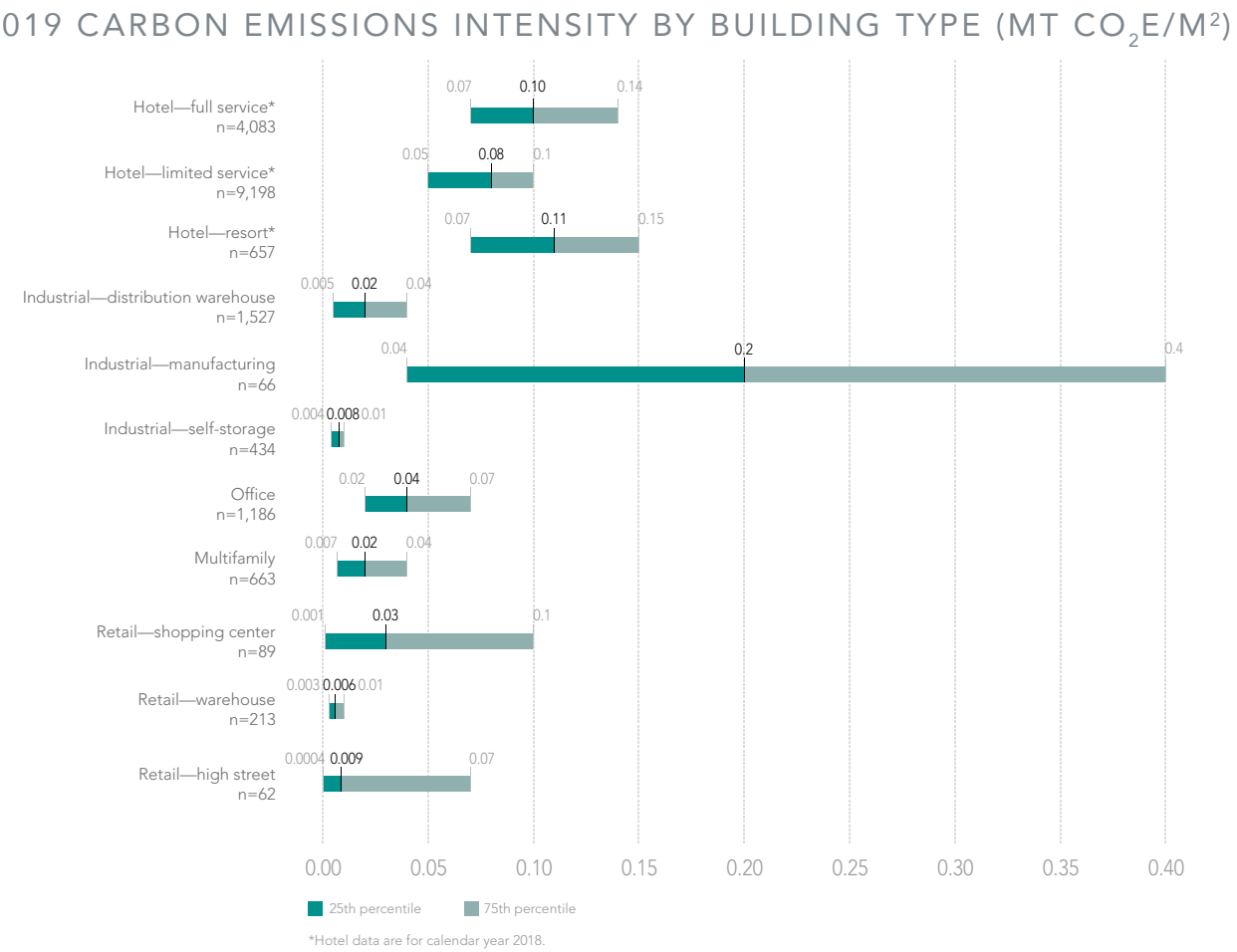
The falling cost of on-site solar and the increased availability of renewable energy from utilities continue to make reducing emissions easier. In addition, a number of large markets are seeing new regulations about building electrification and carbon emission limits, such as in Berkeley and other California cities, or New York City, respectively. The case for reducing carbon continues to build: members that pursue energy efficiency and greater use of renewables will not only help real estate reach broader climate goals but also achieve greater improvements to their bottom line and prepare themselves for the future landscape of building energy policy.

Embodied carbon, or the greenhouse gas emissions attributed to manufacturing and transporting construction materials, the process of construction, and building disposal, can account for as much as 50 percent of a building's total carbon footprint. Unlike operational carbon, embodied carbon from traditional structural materials like concrete, steel, and synthetic insulation cannot be reduced after a building is complete. To meet ambitious climate goals, reducing embodied carbon must be part of the real estate industry's climate mitigation strategy, as outlined in Greenprint's report *Embodied Carbon in Building Materials for Real Estate*.[1] Although Greenprint does not benchmark embodied carbon at this time, such measurement may be possible in the future to drive further tracking and reduction of overall emissions.

Carbon Emissions by Building Type

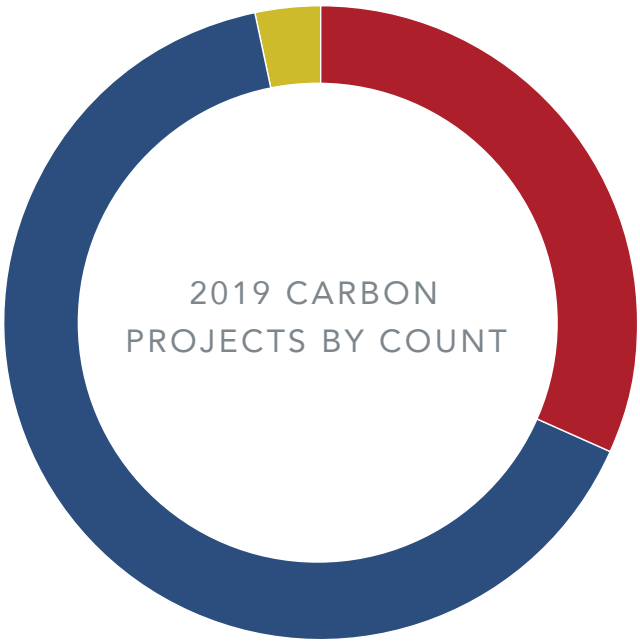
Similar to 2018, industrial-manufacturing and full-service hotel properties showed the highest carbon emissions intensity; both are also high-energy-intensive property types. Retail–warehouse and industrial–self-storage reported the lowest carbon emissions intensity.

Carbon emissions by building are tied to energy use, with both energy and carbon seeing similar reductions from 2018 to 2019. In addition, the Greenprint portfolio saw a significant increase in renewable energy generation and use, increasing the total amount of renewable energy by 14.5 million kilowatt hours (kWh).

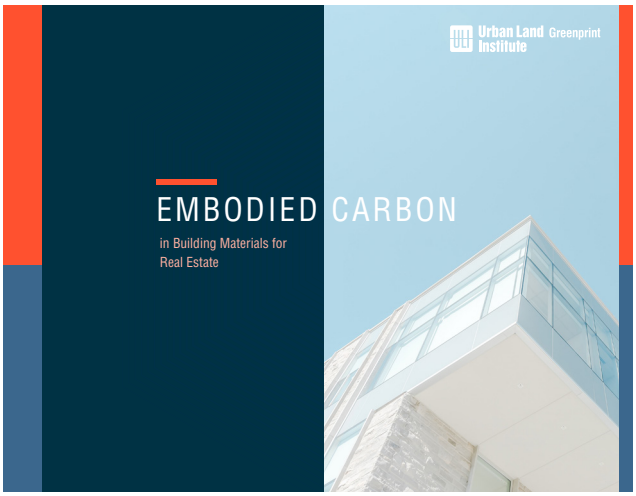


Carbon Reduction Projects Feature On-Site Solar

As more companies move toward deeper carbon emissions reductions, on-site solar is one strategy used to cut carbon and repurpose rooftop and outdoor space for sustainability initiatives. This year Greenprint members completed 94 carbon reduction projects for a total investment of over US$526,760, with 65 percent of the projects dedicated to on-site renewable energy. Another large focus this year for many companies was transportation projects to further reduce their carbon footprint.



30	Transportation	**$130,200**
61	On-site renewable energy	**$395,588**
3	Miscellaneous emissions reductions	**$972**



EMBODIED CARBON IN BUILDING MATERIALS

WOODWORKS, A GREENPRINT INNOVATION PARTNER AND COMPANY DEDICATED TO PROMOTING THE USE OF MASS TIMBER AND CROSS-LAMINATED TIMBER, CONTINUES TO HELP EDUCATE MEMBERS ON THE BENEFITS OF TIMBER IN COMMERCIAL ASSETS—FROM COST SAVINGS TO CARBON REDUCTIONS.

SOLAR FACADE AT HUDSON PACIFIC PROPERTY'S EPIC ASSET

Solar panels line the building envelope at EPIC, a Hudson Pacific Properties 13-story class A office complex in Los Angeles successfully marrying aesthetically pleasing design with carbon reductions. The asset is the first large commercial building in LA to implement building-integrated photovoltaics (BIPV).

Rooftop space was needed for mechanical equipment, so the cascading "steps" of the building provide amenity space while the solar panels on the facade generate electricity and offset energy consumption.

Working closely with Gensler, Hudson Pacific educated city planners about BIPV technology and its sustainability benefits throughout the design process. Once planning and educational initiatives were underway, the team procured manufacturer Walters and Wolf to provide the window system as one complete package, which greatly streamlined the construction process. The building is targeting a LEED Gold certification in the future.

Hudson Pacific installed a total of 310 solar panels on both the east and west sides since those areas have the greatest exposure to sunlight. The panels alone will supply 1.5 percent of the power for the building.

Inside the building, Hudson Pacific included lighting controls and energy-efficient plumbing fixtures to ensure the building reduced carbon emissions by lowering energy demand.

Through these features, Hudson Pacific estimates an additional 15 percent energy savings on top of California's already stringent Title 24 energy codes for new construction.

"EPIC's solar facade represents Hudson Pacific's commitment to innovation and leadership in sustainability. Sustainable design is also a key component of our broader strategy to create state-of-the-art work environments that attract leading companies like Netflix, who has leased the entirety of EPIC."

—Natalie Teear, VP, Hudson Pacific Properties

HUDSON PACIFIC PROPERTIES

EPIC IN LOS ANGELES.

HUDSON PACIFIC PROPERTIES

EPIC IN LOS ANGELES.

SCALING SOLAR ENERGY ACROSS KILROY'S PORTFOLIO

Kilroy Realty Corporation has initiated solar projects on 11 properties in California as part of the firm's efforts to reduce carbon emissions across its 14.3 million-square-foot portfolio. The company has reduced energy consumption by 17 percent since 2010 and has committed to achieving carbon-neutral operations by the end of 2020.

The firm enlisted the help of Black Bear Energy, a technology-enabled commercial buyer's representative specializing in on-site renewable energy and clean-tech services, to get these projects completed from inception through installation. After discussions with Black Bear Energy and analysis of the available properties and facades for solar, Kilroy and Black Bear Energy installed over 3.9 megawatts of solar on the 11 assets. Understanding that battery storage is a critical next step in sustainable and resilient buildings, Kilroy worked to install nine batteries with a total capacity of 4.2 kWh; Black Bear Energy assisted on half of the deals.

Each project was installed on building rooftops and on parking lot rooftops to maximize the square footage available. The solar parking garage canopies allow not only on-site energy generation but also covered parking, solar rental income, shade, and reduced power costs. Tenants have expressed satisfaction with the panels, and Kilroy plans to continue analyzing properties for future solar projects. Once all projects are online, the lifetime carbon reduction is estimated to be 107,536 metric tons of CO_2 (based on 25-year terms) with annual average energy production of 6,083,718 kWh/year. The projects were funded through an unusual combination of a power purchase agreement and a traditional lease, so the panels provide rent to Kilroy in addition to energy cost savings for the building tenants.

"After installing over four megawatts of solar on 11 of our existing assets across California, we looked to see how we could integrate solar on our new developments. Coordination during the design phase was definitely a challenge, and we were fortunate to have Black Bear Energy assist throughout the process. We are thrilled to see more on-site solar in our portfolio, in particular additional solar parking canopies that provide shade for our customers while powering our buildings."

—Sara Neff, senior vice president of sustainability, Kilroy

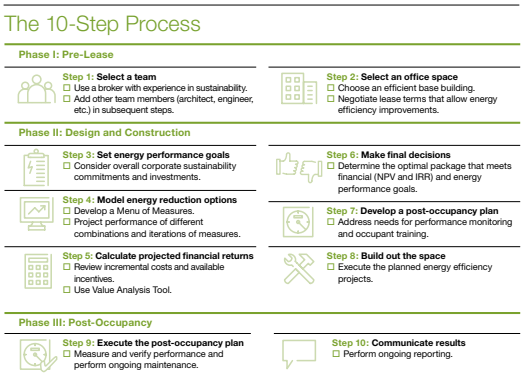
GENSLER/MAKENA HUDSON

KILROY REALTY ROOFTOP SOLAR IN CALIFORNIA.

Energy

The necessity for buildings to reduce energy consumption has never been clearer to address the climate crisis. Even so, overall the United States hit record-high energy use in 2018, barely decreasing in 2019,[2] while global energy demand rose in both years.[3,4] Greenprint members continue to make the business case for energy efficiency and show leadership on this front.

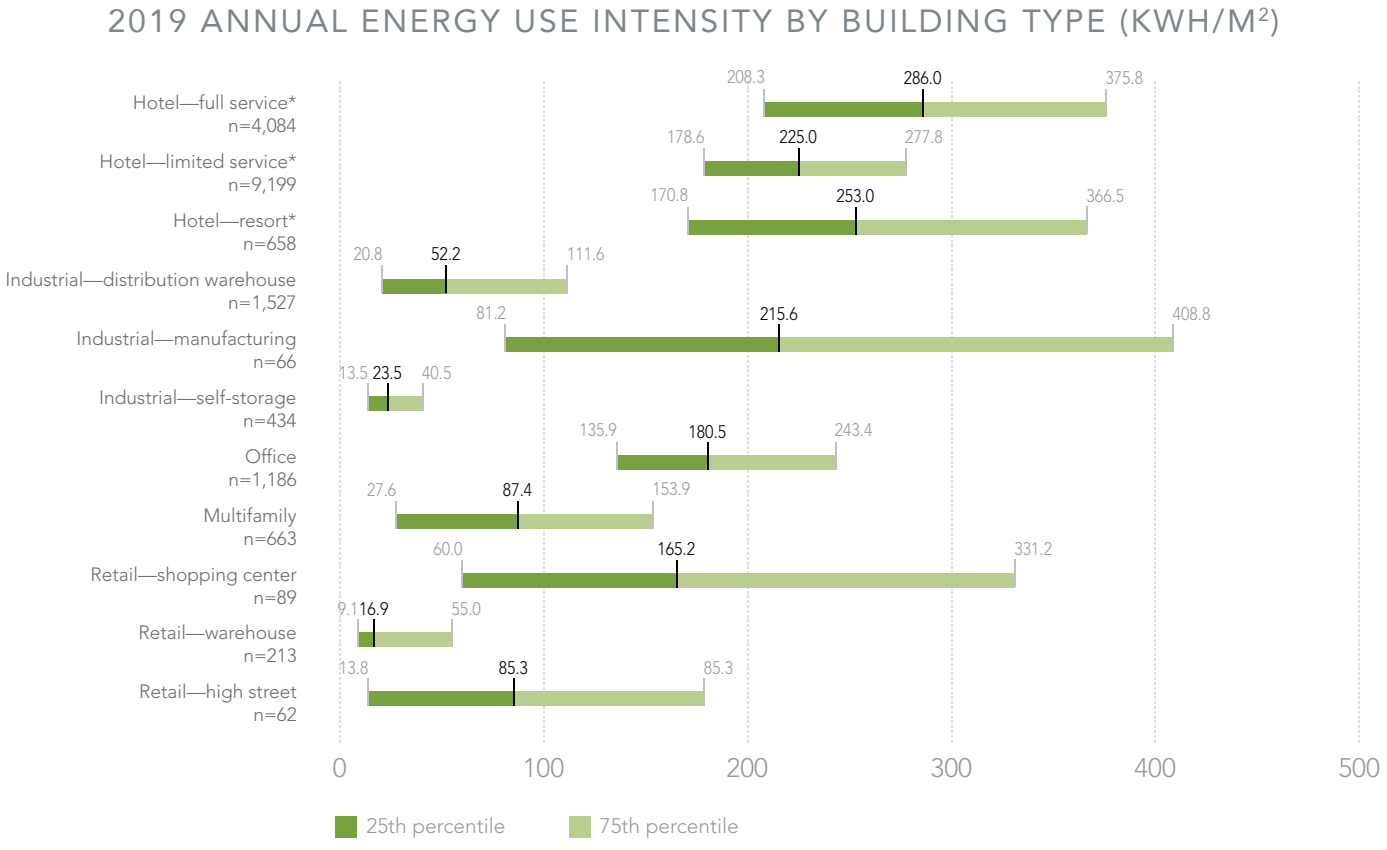
Fortunately, many "low-hanging fruit" opportunities for efficiency can be addressed, such as lighting or HVAC upgrades or retro-commissioning. In addition, programs to engage tenants, such as Greenprint's Tenant Energy Optimization Program (TEOP),[5] are critical for driving efficiency in leased spaces, because tenants can often account for 50 percent or more of a building's energy use.[6] Companies looking to advance further can work to tackle the pressing but challenging issue of deep energy retrofits.



10 STEPS OF THE TENANT ENERGY OPTIMIZATION PROGRAM.

Energy Performance by Building Type

Annual EUI benchmarks help owners better understand their building's performance over time and compared against peers. Hotels once again had the highest median energy use per square meter, followed by industrial–manufacturing properties. Retail–warehouse used the least energy per square meter, followed by industrial–self-storage.



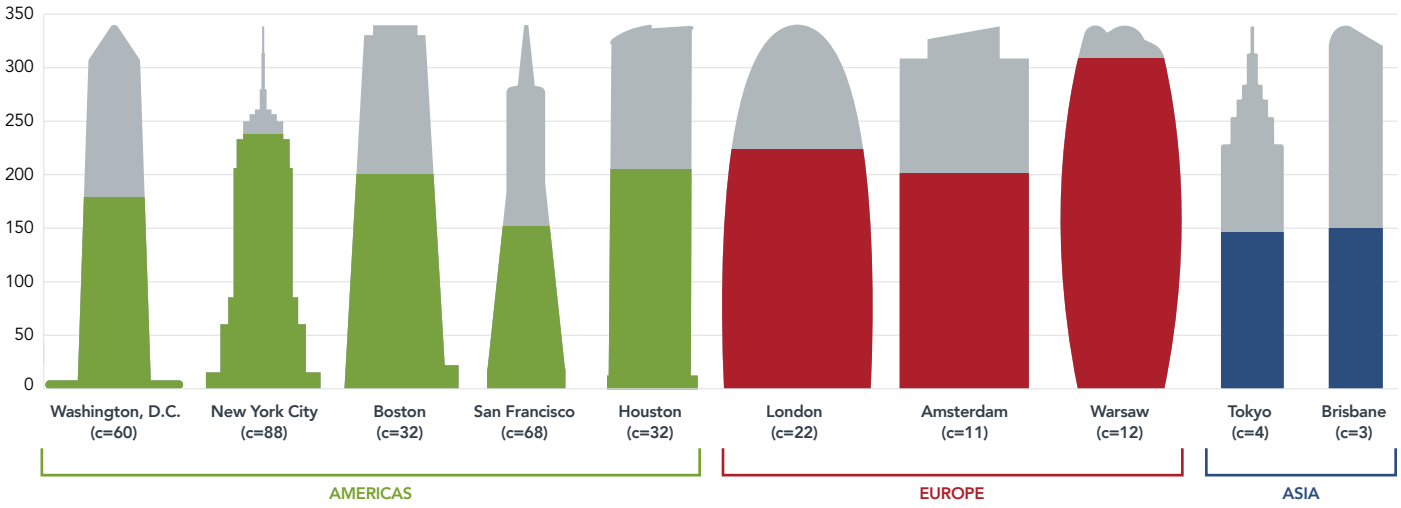
*Hotel data are for calendar year 2018.

City-Specific Office Benchmarks

Buildings contribute nearly 40 percent of carbon emissions globally and upward of 70 percent in many urban areas. As cities around the world work toward meeting the goals of the Paris Agreement, the real estate community has an opportunity to contribute to the dialogue. Efforts are ratcheting up to improve collaboration between city governments and real estate stakeholders to reach shared climate goals, as covered in Greenprint's recent *Decarbonizing the Built Environment: 10 Principles for Climate Mitigation Policies*.[8]

EUI varies significantly across markets and is driven by many local factors, including climate, economy, tenant mix, building codes, and property operating standards. In the Greenprint portfolio, office properties in Tokyo, Brisbane, and San Francisco use less energy per square meter than those in other major cities such as Warsaw and New York City. This may be in part because these properties are subject to some of the strictest global environmental regulations.

2019 MEDIAN OFFICE ENERGY USE INTENSITY BY CITY (KWH/M^2)



THANK YOU TO GREENPRINT'S DATA PARTNERS

ULI is an Energy Star partner and proud recipient of a 2020 Excellence award in Energy Star Promotion. For Greenprint members with properties in the United States and Canada, Energy Star Portfolio Manager is a free online benchmarking tool that building owners and managers can use to measure and track energy, water, and waste consumption. Over 67 percent of Greenprint member properties in the United States and Canada collect their environmental data in Portfolio Manager.

Since 2016, Greenprint has partnered with Measurabl to leverage its software tool in support of data collection, analysis, and reporting from Greenprint members. This longstanding relationship drives sustainability and building performance tracking to streamline ESG reporting and provide opportunities for portfolio-wide energy management to plan, do, check, and act.

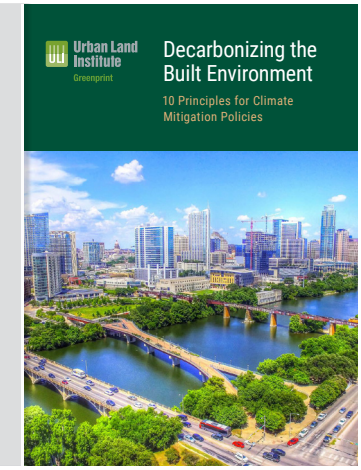
For the fourth year running, Greenprint has partnered with the Cornell Hotel Sustainability Benchmarking (CHSB) initiative to present a more comprehensive hospitality performance benchmark. It is a collaborative initiative aimed at developing hotel industry–specific benchmarks for energy use, water use, and carbon emissions.

In 2020, Greenprint added Goby as a data partner as well to improve the data reporting experience of Greenprint members who use that ESG platform.

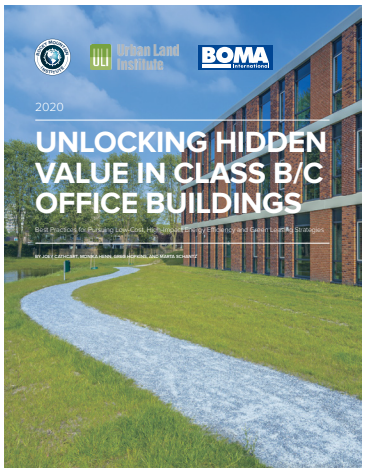
Energy Efficiency Projects Feature Lighting and Controls Upgrades

As in past years, energy efficiency projects remain a top priority for many Greenprint members. This year members invested over US$47.7 million on energy efficiency projects spanning the gamut from building management system (BMS) or building automation system (BAS) controls and smart building improvements to high-efficiency lighting, HVAC, and appliance upgrades. With a total of 3,971 individual projects,the momentum behind energy efficiency does not appear to be slowing. ULI's report with BOMA and RMI, *Unlocking Hidden Value in Class B/C Office Buildings,*[7] provides examples of further opportunities for sustainability in real estate.

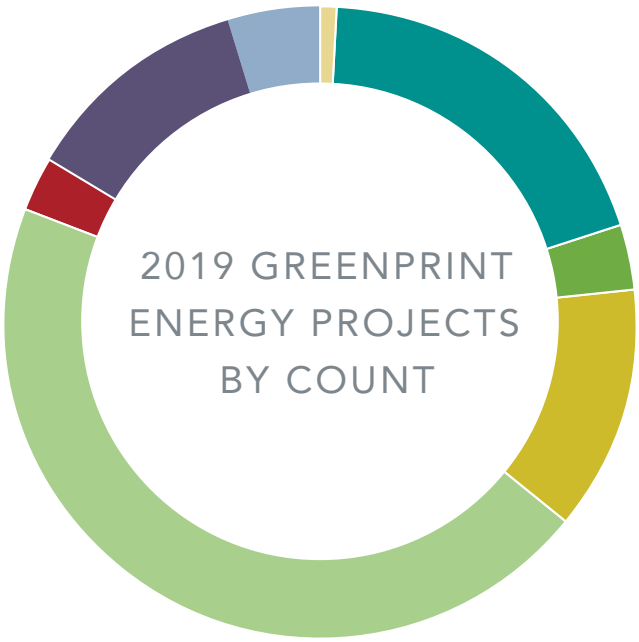
TWO OF GREENPRINT'S INNOVATION PARTNERS FOCUS ON IMPROVING ENERGY EFFICIENCY IN THE BUILT ENVIRONMENT IN SLIGHTLY DIFFERENT WAYS. CARBON LIGHTHOUSE IS FOCUSED ON OVERALL ENERGY EFFICIENCY, BUILDING SENSORS, AND BETTER INTEGRATION AND OPTIMIZATION OF EFFICIENT HVAC AND TECHNOLOGY INTO EXISTING BUILDINGS. NOVA GROUP GBC ADDRESSES WHOLE-BUILDING DUE DILIGENCE WITH A MORE HOLISTIC AND SUSTAINABILITY-FOCUSED LENS, SUCH AS BY OFFERING "GREEN" PROPERTY CONDITION ASSESSMENTS.



DECARBONIZING THE BUILT ENVIRONMENT: 10 PRINCIPLES FOR CLIMATE MITIGATION POLICIES



UNLOCKING HIDDEN VALUE IN CLASS B/C OFFICE BUILDINGS



37	Behavior change/tenant engagement	$124,612
763	BAS/BMS/controls	$5,443,979
127	Building envelope	$5,970,567
505	High-efficiency equipment: HVAC, appliances	$25,205,099
1,785	High-efficiency equipment: lighting	$8,948,511
109	Metering	$1,398,095
462	Technology/smart building upgrades	$144,653
183	Commissioning/recommissioning	$464,808

LBA REALTY'S PARK PLACE CAMPUSWIDE LED RETROFIT

The redevelopment of LBA Realty's Park Place corporate campus in Irvine, California, achieved significant energy reductions translating to US$142,000 in savings through lighting improvements as part of a larger property renovation. The campus spans 1.8 million square feet and has 105 acres of mixed-use assets including office, residential, and retail.

A main focus of the renovation was the campuswide LED interior retrofit completed on nine buildings. The initiative replaced 23,000 lamps with LED bulbs and has an estimated energy savings of 1.14 million kWh. The lighting retrofit cost US$446,000 in full but included a US$263,000 utility rebate to offset some of the costs. All in, the project has an estimated payback period of 1.3 years, which makes it a cost-effective initiative with long-term financial and environmental benefits. Beyond these energy and financial savings, the project reduced carbon emissions by 803 metric tons (or 1.8 million pounds), thus helping LBA's portfolio continue to achieve deep carbon and energy reductions. Tackling energy efficiency upgrades, such as LED retrofits, is a critical first step in increasing an asset's overall carbon emission reductions. Without embedding strong energy efficiency decisions in design, construction, and operations of an asset, owners and investors run the risk of losing out on potential savings. LED retrofits, lighting upgrades, and lighting sensors are great places for companies to start because they have quick payback periods and proven energy savings.

"LBA is dedicated to driving a business case approach to environmental responsibility by enhancing our sustainability program and economic performance on an ongoing basis for the benefit of our investment partners, customers, employees and communities. The Park Place Team continually seeks creative opportunities to reduce operating costs by utilizing new technology and implementing progressive ways to lower energy consumption."

—Melanie Colbert, Principal, Operations, LBA Realty

LBA REALTY

PARK PLACE IN IRVINE, CALIFORNIA.

AXA IM OPTIMIZING HEATING MANAGEMENT WITH TEMPERATURE SENSORS

AXA Investment Managers (AXA IM) installed temperature sensors in its Finnish multifamily assets to optimize heating management. In colder-climate winter months, heating costs and use can add up quickly and significantly affect energy savings potential, as well as net operating income and net rental income.

As part of a strategy to better manage costs and upgrades, AXA IM pays for heating costs in its Finnish multifamily properties, which minimizes the traditional landlord/resident split incentive. The firm installed temperature sensors and a data and energy tracking system throughout a number of units in each property as a proof of concept and pilot project.

The Leanheat system inputs data on the local weather forecast, real-time energy prices, and apartment heating use based on sensors in each unit to provide holistic management of the heating system. The algorithm helps eliminate unnecessary overheating and is expected to save 5 to 15 percent in energy consumption per property annually. This translates into US$1.9 million/metric ton/year in additional net rent with savings representing 1 percent of gross rents across the company. The total heating project has an estimated 10-year internal rate of return of 15.1 percent. The project not only produces significant energy and financial savings, but it also allows tenants a higher level of thermal comfort.

The success and projected energy savings of this project have led AXA IM to analyze whether the initiative can be rolled out at more multifamily properties across its portfolio.

"With our integrated approach to responsible investment, we focus on decarbonization, resilience, and building tomorrow. With this pilot project in Finland, we are contributing towards the decarbonization of the asset by optimizing heating consumption, we are focusing on resilience by ensuring the assets are able to provide optimal thermal comfort for tenants in light of a change in climate, and finally we are building tomorrow by seeking to deliver innovative solutions while developing the capability of our investment teams to identify new opportunities to create value and minimize risk to meet rapidly evolving societal and market expectations."

—Max Kufer, global sustainability manager, AXA

AXA INVESTMENT MANAGEMENT

MULTIFAMILY PROPERTY IN FINLAND.

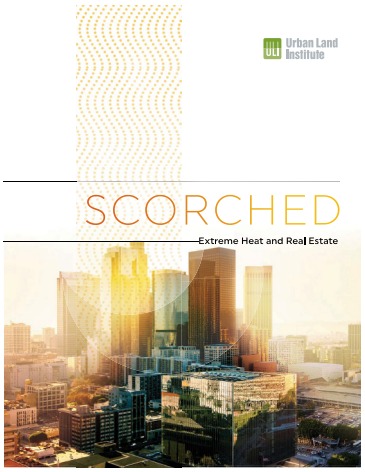
AXA INVESTMENT MANAGEMENT

MULTIFAMILY PROPERTY IN FINLAND.

Water

Improving water efficiency has always been a smart financial decision to reduce operating expenses—directly through utility costs and indirectly by reducing the energy required to run on-site water-related facilities.

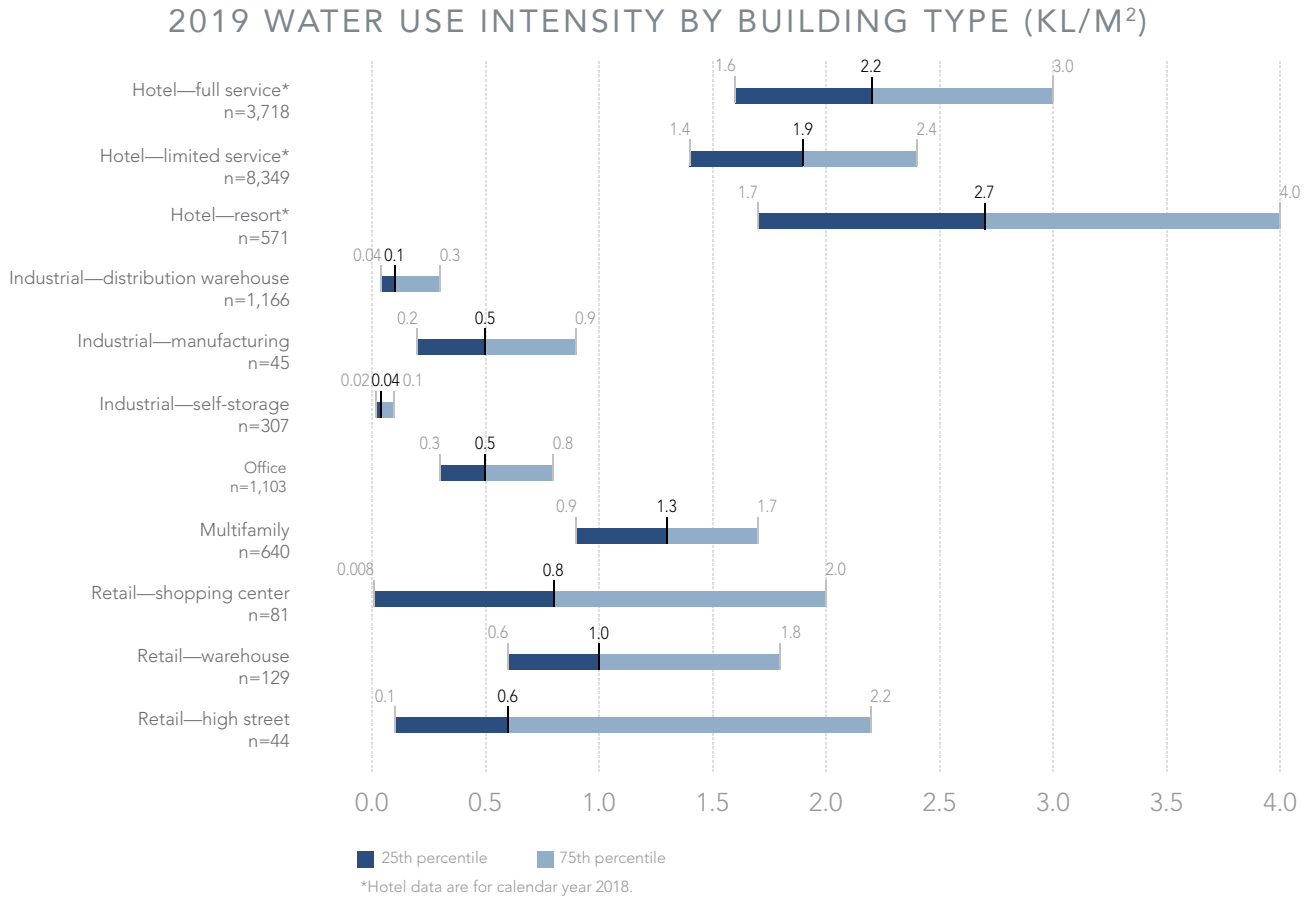
However, water is taking on increased importance as climate change continues to drive higher average temperatures and more frequent heatwaves and droughts, thereby affecting global water supplies. As covered in ULI's recent report *Scorched: Extreme Heat and Real Estate,*[9] boosting asset resilience through water conservation will be essential to prepare for disruption in an era of potential water shortages or use restrictions, a future that has already arrived in many arid regions.



SCORCHED: EXTREME HEAT AND REAL ESTATE.

Water Performance by Building Type

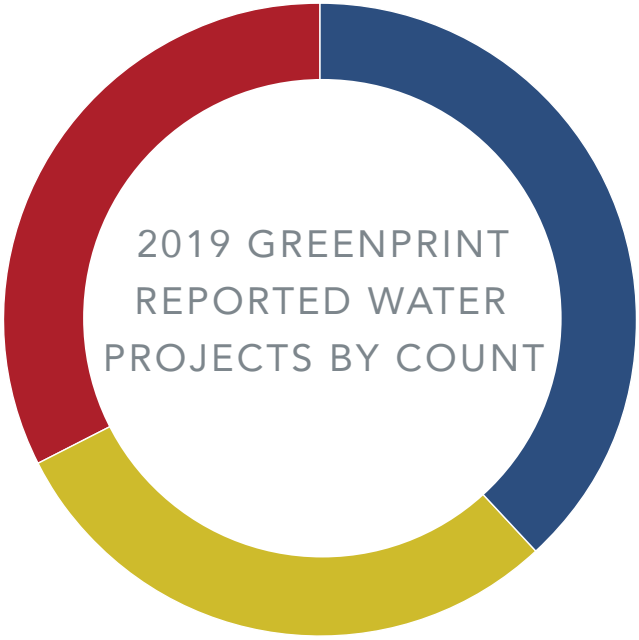
As expected, hotels and multifamily properties reported the highest water use per square meter, whereas industrial distribution warehouses and self-storage properties report the lowest. Higher water use in buildings correlates with landscaping, bathroom fixtures (including showers), restaurants, and laundry facilities.



Water Efficiency Projects Span Indoor and Outdoor Measures

Although building owners and operators have long understood that interior water efficiency upgrades have a payback in water conserved, dollars saved, and energy reduced, Greenprint members are increasingly turning to outdoor spaces as a means of further reducing water use at a property. They are focusing additional attention on technology and innovation to drive water efficiency in new ways.

In 2019, companies engaged in 875 water efficiency projects, 30 percent of which occurred outside the building structure, applying to areas such as drought-tolerant landscaping and drip/smart irrigation systems, and 32 percent on technology and innovation measures such as leak detection and wastewater treatment. Combined water project investments tallied over US$2.4 million.



333	High-efficiency equipment/ appliances (e.g., cooling tower management, high efficiency/ dry fixtures)	**$1,406,538**
258	Outdoor water efficiency and landscaping	**$962,290**
284	Technology and innovation (e.g., stormwater reuse, metering, leak detection, wastewater treatment)	**$126,116**

CENTERPOINT INDUSTRIAL REPOSITIONING WITH INDOOR AND OUTDOOR WATER SAVINGS

CenterPoint's tight-timeline warehouse repositioning in Buena Park, California, was aimed at offering the building's new tenant significant water reductions while also focusing on the overall sustainability and energy of the asset. As an infill warehouse near the ports of Los Angeles and Long Beach as well as Los Angeles International Airport, location was just one factor attracting a large tenant, Unified Network Information Services. The company signed a seven-year lease to occupy the 1.07 million-square-foot property in large part because CenterPoint's US$20 million repositioning efforts offered significant water savings and other energy and sustainability features in the near and long terms.

To upgrade the building's aesthetics and make it more environmentally and economically sound, CenterPoint installed a reflective thermoplastic polyolefin roof membrane to lower the heat island effect, as well as drought-tolerant landscaping and high-efficiency irrigation fixtures that can help achieve an outdoor water-use reduction of more than 36 percent on average. Inside, CenterPoint installed low-flow plumbing features and Energy Star–certified fixtures throughout the entire property, which can help CenterPoint's tenant save, on average, up to 42 percent on its indoor water use.

Kim Rierson, CenterPoint's west regional vice president of construction, said the exhaustive construction plan is part of the company's mission to own and develop environmentally sound properties.

CenterPoint did not stop at water savings while retrofitting the property. The repositioned property also includes high-performance interior and exterior LED lighting, new energy-efficient HVAC systems, 948 new skylights in the warehouse, increased insulation to reduce energy loss, low-emitting construction materials, low volatile organic compound paint, and thermal comfort features to meet ASHRAE 55-2004. Though CenterPoint expects to tally actual savings after one year of occupancy, industry projections indicate these measures could result in 65 percent lower energy bills, increased natural daylighting in industrial spaces that do not usually have as much sunlight access, and 80 percent of employees reporting a higher level of productivity.

"This repositioning project perfectly showcases CenterPoint's deep commitment to developing high-performance industrial facilities that give our customers distinct environmental, economic, and operational advantages."

—Kim Rierson, west regional vice president of construction, CenterPoint

CENTERPOINT INDUSTRIAL

BUENA PARK, CALIFORNIA, WAREHOUSE.

CENTERPOINT INDUSTRIAL

BUENA PARK, CALIFORNIA, WAREHOUSE.

CDL'S PORTFOLIO-WIDE WATER REDUCTION ANALYSES

Based in Singapore, a high-physical-risk city for water scarcity, according to the World Resources Institute, City Developments Limited (CDL) has a strong focus on sustainability, with water conservation being a top priority. CDL tackles water reduction with a holistic, life-cycle approach and analyzes its entire portfolio to achieve high levels of water reduction each year. In 2019, CDL was the only company in Southeast Asia and Hong Kong to achieve the CDP A List for water security, an affirmation of CDL's effective water management strategy.

CDL analyzes and reviews its portfolio annually and installs water-efficient features and fittings, such as flow regulators and self-closing taps, widely across assets. In addition, the company performs annual impact analysis on utility bills to better understand the implications of higher water tariffs. Whenever possible and safe to do so, CDL uses NEWater for operations that do not require potable water, thereby reducing reliance on potable water. NEWater is a high-grade reclaimed water produced from treated used water by Singapore's water agency, the Public Utility Board (PUB). These efforts combine to help the company progress toward its goal of reducing water use intensity by 50 percent from 2007 levels for office and industrial buildings and 9 percent from base-year levels for retail buildings by 2030.

For CDL's managed buildings, the water intensity for its office, retail, and industrial assets were 0.9 m^3/m^2, 3.1 m^3/m^2, and 0.2 m^3/m^2, respectively, in 2019. To date, 12 of CDL's properties have been certified as "Water Efficient Buildings" by Singapore's PUB, and the company was one of the first recipients of the inaugural Watermark Award by PUB. At CDL's construction sites, the water intensity for 2019 was 0.76 m^3/m^2, which met the interim target of 1.75 m^3/m^2 for 2019, on track to achieving 2030 water reduction targets.

CDL's recently launched Piermont Grand Executive Condominium, a development awarded BCA Green Mark Platinum and Universal Design Mark GoldPLUS designations, features a smart energy and water monitoring system that uses an advanced water leak detection algorithm to track and manage power and water use in common areas more efficiently. Such features at Piermont Grand enable potential water usage savings of approximately 73,881 cubic meters annually.

"With high water consumption, the building sector can make a difference in contributing to Singapore's water resilience. A robust water management strategy which involves water-sensitive design, conservation, and measures to raise efficiency through the life cycle of a development has been an integral part of CDL's sustainability commitment. We believe that improved water resources management is also fundamental to achieving our low carbon ambitions and strategic goals set under our Future Value 2030 Sustainability Blueprint."

—Esther An, chief sustainability officer, CDL

CITY DEVELOPMENTS LIMITED (CDL)

CDL DEVELOPMENT IN SINGAPORE.

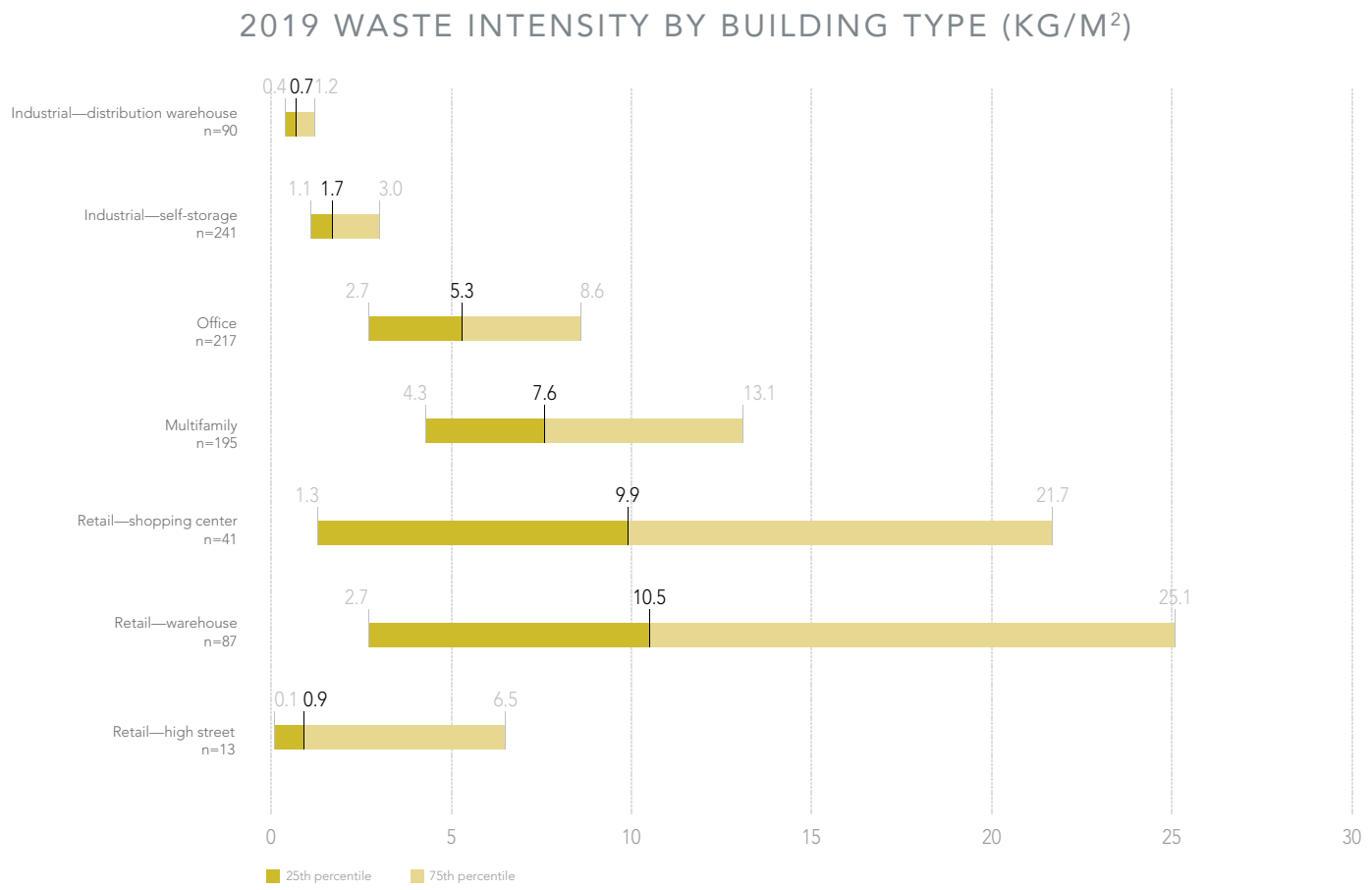
Waste

Though reducing waste is difficult because of the challenges of measuring and tracking waste accurately and the lack of innovations to drive waste reductions at scale, Greenprint members continue to make progress through occupant engagement. Many are looking for new technologies to better understand their waste streams and finding ways to increase diversion from landfills, during both construction and operation.

For example, sustainable construction techniques such as prefabricated modular buildings, material reuse, or repurposing older buildings can help avoid waste creation and build the circular economy while also reducing energy and carbon.

Waste Performance by Building Type

Across the Greenprint portfolio, more buildings are tracking and reporting waste data. In 2019, retail properties reported the most waste per square meter, and distribution warehouse facilities reported the lowest waste intensity.

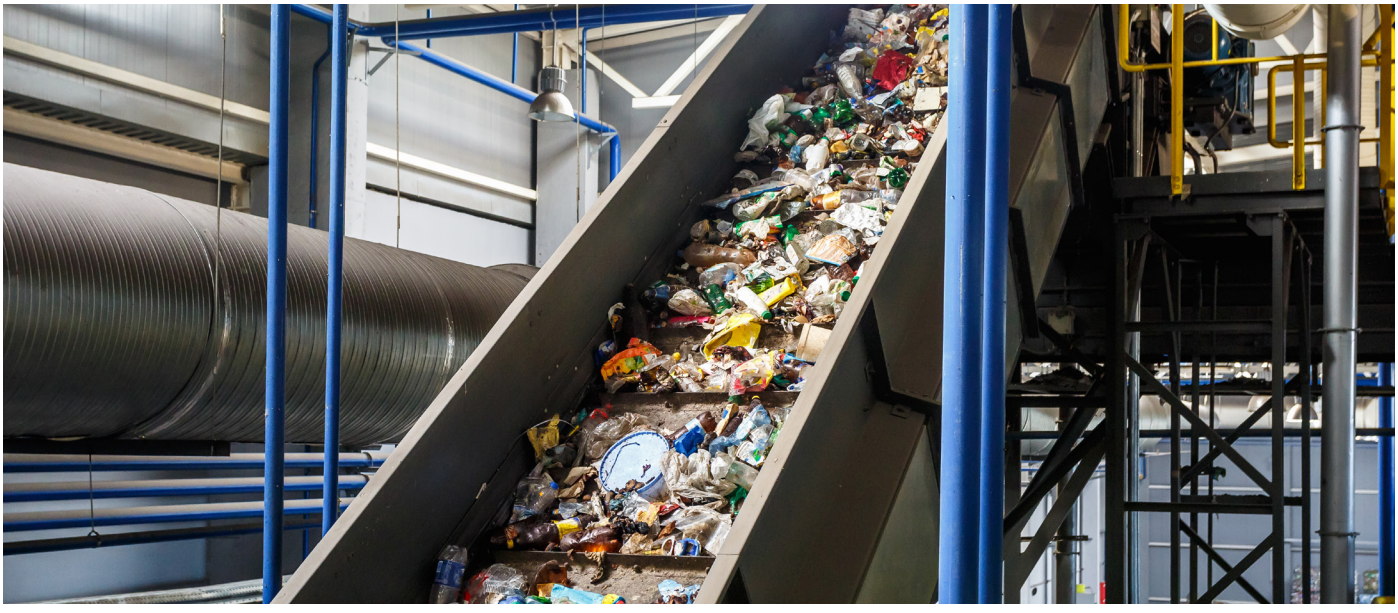


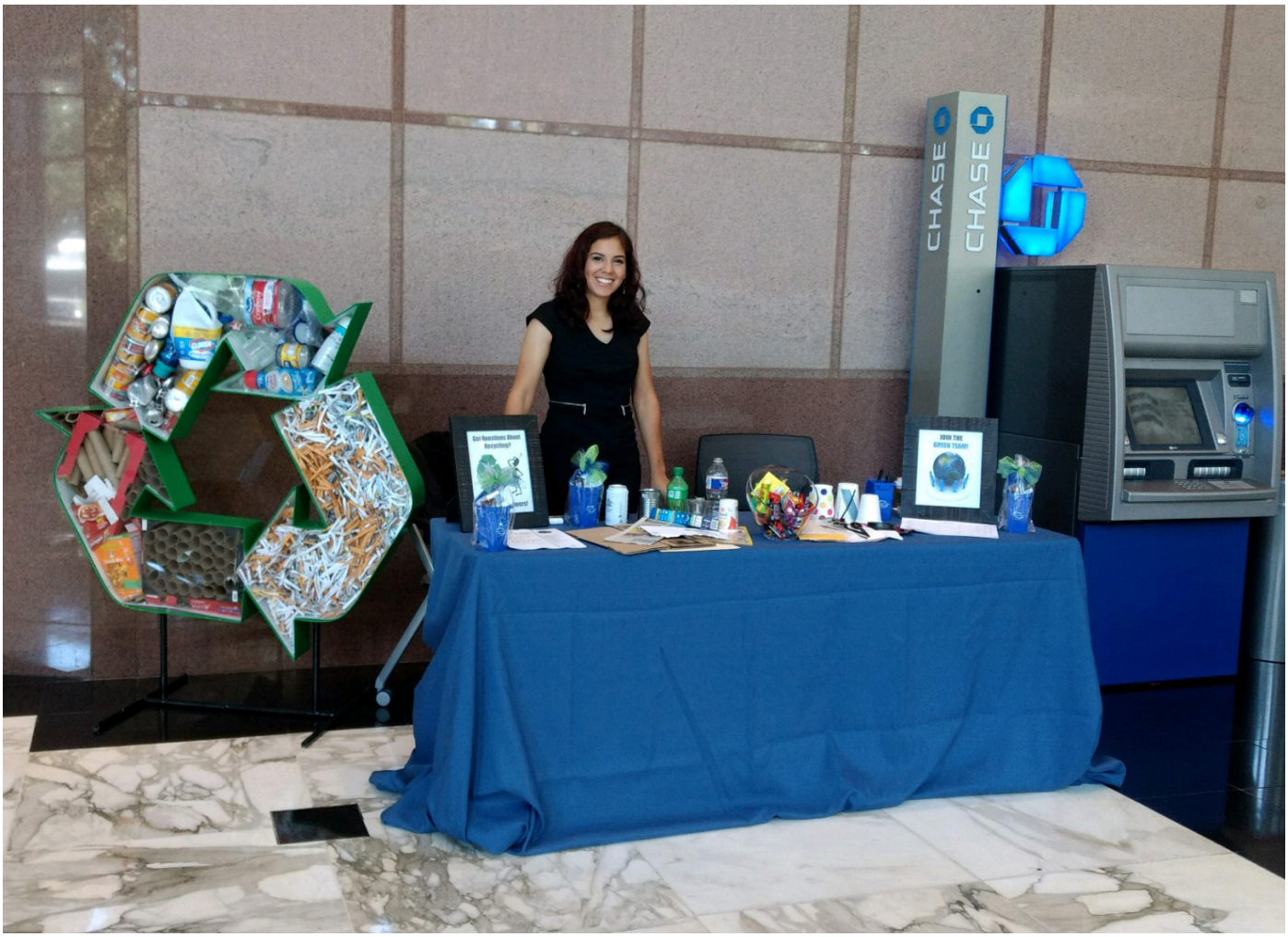
Waste Projects Focus on Recycling and Management

Waste reduction initiatives were the second most frequent project type undertaken by Greenprint members this year. With a total of 1,182 projects and an investment of over US$246,104, waste initiatives remain a low-cost way to engage tenants, increase recycled material, and avoid sending unnecessary amounts of materials to landfills and further releasing methane and carbon emissions.

This year, many continued with tried and true waste and recycling monitoring, auditing, and general reduction tactics, while some began to implement composting (both food scraps and landscaping) at properties.

35	Composting (landscape and food waste)	**$1,180**
619	Recycling program	**$224,081**
317	Waste management	**$19,209**
211	Waste monitoring, audits, and tenant engagement	**$1,632**





PARKWAY

BUILDING STAFF MANAGING A TENANT EDUCATION TABLE ON WASTE REDUCTION.

"Our portfolio-wide approach to waste management has allowed us to standardize our operations and create a more efficient and effective program. Since overhauling our recycling program, we have more than doubled our recycling rate."

—Matt Kent, managing director, Parkway Properties

PARKWAY'S PORTFOLIO-WIDE WASTE STRATEGY

Parkway began a major push in 2017, which continues today, to improve overall recycling rates and reduce waste-hauling costs across its portfolio. Continued focus on waste management programs has helped increase the recycling rate portfolio-wide to 52 percent in 2019, which is bringing the company closer to its goal of 75 percent waste diversion by 2025.

The first step was evaluating existing waste management and recycling infrastructure at each property. Swaps included switching antiquated trash bins for modern trash compactors, expanding use of cardboard bailers, and working with existing janitorial teams to improve the daily waste collection and recycling processes at each site.

Parkway also rebid several waste-hauling contracts with the goal of reducing monthly waste-hauling costs. In one case this helped reduce monthly waste and recycling bills by more than 80 percent. To make sure that Parkway continues to identify waste diversion opportunities, Corporate Waste Solutions, the primary waste hauler, performs waste audits, tracks all waste streams and diversion rates, and educates tenants and building users through in-house training, seminars, newsletters, green team meetings, and events.

This waste tracking initiative dramatically expanded Parkway's waste management capabilities. In addition to daily trash and recycling collections, shredded paper, light bulbs, batteries, e-waste, and construction waste are now tracked and collected monthly. Parkway's e-waste recycling program has collected a total of 324,860 pounds of e-waste. In addition, an annual textile recycling drive is held for tenants.

LASALLE

SIGNAGE AND EDUCATION FOR TENANTS ON PROPER WASTE SEPARATION.

LASALLE

BUILDING STAFF WORK TO KEEP WASTE SEPARATED AND REDUCED.

LASALLE

WASTE BINS TO HOLD SEPARATED MATERIALS.

“As the asset manager for our Shanghai International Plaza property, I am very pleased to see our initiative to engage with our tenants resulting in enhanced waste sorting and recycling. The tenants have communicated their appreciation, especially for the parking coupons, which have driven adoption of our battery recycling program.”

—Selena Shi, asset manager, SIP

LASALLE PRIORITIZES WASTE REDUCTION THROUGH OCCUPANT ENGAGEMENT

LaSalle Investment Management acquired and started renovations on Shanghai International Plaza (SIP), a mixed-use office and retail property in 2018. Upon completion, LaSalle began an occupant waste diversion initiative with tenant engagement reaching almost all tenants for participation in waste reduction efforts within a four-month period.

The SIP property management team was given training and guidance on correct sorting procedures, which were well received by the staff. All items are divided into wet waste, dry waste, recyclable waste, and harmful waste, and the property management team assists tenants in handling large recyclable pieces.

LaSalle successfully engaged most of SIP’s 88 tenants and continually works to find ways to incentivize sorting of waste and recycling. In one instance, the property management team exchanged parking vouchers to cover the cost of parking for used batteries to encourage tenants to properly dispose of the e-waste.

The local Shanghai government also began to promote the best practice of sorting waste at commercial properties. This helped reinforce the SIP initiatives and drive tenants to do their part.

Globally, LaSalle is dedicated to waste reduction and hopes to continue these efforts at SIP and beyond as they gain traction and efficiency. LaSalle plans to continue quantifying the waste diversion and success rate of the program to build momentum and scale.

Guide to Report Terms and Charts

ENERGY USE INTENSITY (EUI)

Annual energy consumption divided by gross floor area. This report uses site EUI, which is equal to energy used on site divided by floor area.

GREENHOUSE GAS (GHG) EMISSIONS

Carbon dioxide (CO_2) and other gases released into the atmosphere as a result of energy consumption at the property. Emissions are expressed in carbon dioxide equivalent (CO_2e), which normalizes global warming potential of each gas to an equivalent quantity of carbon dioxide.

MEDIAN

The value lying at the midpoint of a distribution of observed values.

WASTE DIVERSION

Reducing waste sent to a landfill through reduction of waste generation, recycling, reuse, or composting.

GREENPRINT BENCHMARK DATA THRESHOLDS

Benchmarks presented in this report represent the full suite of data provided by members, irrespective of lease type or occupancy level. The Greenprint like-for-like analysis excludes buildings with less than 24 months of data collected, with over 50 percent change in energy use from year to year, and with energy use intensities between 3.15 and 3,153 kilowatt-hours per square meter. The analysis does not account for additional variables such as heating and cooling degree days, vacancy rates, and occupant density.

NOTES

1 ULI Greenprint, *Embodied Carbon in Building Materials for Real Estate* (Urban Land Institute, 2019), https://uli.org/embodiedcarbon.
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3 International Energy Agency, *Global Energy & CO2 Status Report 2019* (March 2019), https://www.iea.org/reports/global-energy-co2-status-report-2019.
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6 Energy Star, "Engage employees and other occupants," https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/save-energy/engage-occupants.
7 Joey Cathcart, Monika Henn, Greg Hopkins, and Marta Schantz, *Unlocking Hidden Value in Class B/C Office Buildings: Best Practices for Pursuing Low-Cost, High-Impact Energy Efficiency and Green Leasing Strategies* (Rocky Mountain Institute, Urban Land Institute, and BOMA International, 2020), https://uli.org/classbcenergyefficiency.
8 Urban Land Institute, *Decarbonizing the Built Environment: 10 Principles for Climate Mitigation Policies* (Washington, DC: ULI, 2020).
9 Katharine Burgess and Elizabeth Foster, *Scorched: Extreme Heat and Real Estate* (Washington, DC: Urban Land Institute, 2019), https://uli.org/extremeheat.

About ULI

The Urban Land Institute is a global, member-driven organization comprising more than 45,000 real estate and urban development professionals dedicated to advancing the Institute's mission of providing leadership in the responsible use of land and in creating and sustaining thriving communities worldwide.

About ULI Greenprint

The ULI Greenprint Center for Building Performance is a worldwide alliance of leading real estate owners, investors, and strategic partners committed to improving the environmental performance of the global real estate industry. Through measurement, benchmarking, knowledge sharing, and implementation of best practices, Greenprint and its members strive to reduce greenhouse gas emissions by 50 percent by 2030.

About This Report

For the real estate industry, improved environmental performance can reduce operating expenses, increase tenant demand, lead to more efficient management of natural resources, and increase property value. This report tracks industry progress on improved performance using Greenprint-member and strategic-partner properties as a proxy to demonstrate the progress that can be achieved industrywide.

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