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State of Green

Greenprint Performance Report



Urban Land
Institute

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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 to shape the future of the built environment for transformative impact in communities worldwide.

ULI's interdisciplinary membership represents all aspects of the industry, including developers, property owners, investors, architects, urban planners, public officials, real estate brokers, appraisers, attorneys, engineers, financiers, and academics. Established in 1936, the Institute has a presence in the Americas, Europe, and Asia Pacific regions, with members in 80 countries.

More information is available at uli.org. Follow ULI on Twitter, Facebook, LinkedIn, and Instagram.

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 and achieve net zero carbon operations by 2050.

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. These benchmarks can be utilized by a range of stakeholders (e.g., academic researchers, sustainability practitioners, policymakers) as a reference point for analysis on multiple facets of real estate sustainability.

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Introductory Letter

A whirlwind of a year for real estate, the economy, and the world, 2020 saw the COVID-19 pandemic disrupt everything—the real estate market, the business of our tenants, and the strategy of our investors. This disruption also posed a threat to progress toward environmental, social, and governance (ESG) goals: Would the momentum we have seen over the past few years be lost as we all focused on COVID? Fortunately, the answer is no. We are pleased to report just the opposite: real estate doubled down on the importance of sustainability, from carbon emissions reductions, to healthy building improvements, to climate risk analyses, to support for racial justice. Never has the totality of ESG been valued more, and never has the ULI Greenprint real estate membership been stronger:



Each year, ULI Greenprint reports on its members' progress against their collective goals in this performance report. Since 2009, we have provided data analysis tracking the goal of 50 percent reduction in carbon emissions by 2030, and now we are beginning to track against a new goal: net zero carbon operations by 2050. To date, 17 ULI Greenprint real estate members have aligned with the net zero goal, representing a serious commitment to addressing the climate crisis.

Larry Fink's annual letter this year to CEOs further highlights the criticality of net zero in the real estate sector:

"There is no company whose business model won't be profoundly affected by the transition to a net zero economy. . . . As the transition accelerates, companies with a well-articulated long-term strategy, and a clear plan to address the transition to net zero, will distinguish themselves with their stakeholders—with customers, policymakers, employees, and shareholders—by inspiring confidence that they can navigate this global transformation. But companies that are not quickly preparing themselves will see their businesses and valuations suffer as these same stakeholders lose confidence that those companies can adapt their business models to the dramatic changes that are coming."

—Larry Fink, chairman and chief executive officer, BlackRock



“The COVID era, for all its horrors, has heightened the importance of living thoughtfully, facing challenges, and being part of the solution, whatever the problem is. Climate change did not pause while we focused on the existential crisis this virus brought. It continued—evident in extreme heat in areas where moderate temperatures have been the norm, in the early onset of wildfire season, in drought and in flooding. ULI’s Greenprint program is about solutions to problems that can’t be wished away. Its performance report is a testament to action being taken to lessen greenhouse gas emissions, to reduce the built environment’s impact on our planet. Join with the industry on a journey to net zero—collective action is necessary to take on climate change.”

—Mary Ludgin, PhD, board chair of the ULI Center for Sustainability and Economic Performance, and senior managing director and director of global investment research, Heitman

ULI’s annual *Greenprint Performance Report* offers a unique opportunity to understand the impact of COVID-19 on building performance—the “state of green,” if you will. Anecdotal evidence warned that energy consumption in 2020 was not dropping as low as expected with tenants staying home from office buildings, and the data proved that true: collective performance of Greenprint-member office properties showed only a 17.8 percent reduction in energy use intensity from 2019 to 2020. This reinforced the importance of whole-building energy efficiency, no matter the tenant structure, to achieve optimal decarbonization. Goldman Sachs Asset Management, for example, conducted detailed energy efficiency improvement projects in two office buildings to generate over \$1 million in savings over the next 10 years.

Despite the uncertainties that came with 2020, the overall ULI Greenprint portfolio continued on its journey to decarbonize. In 2020, Greenprint members implemented over 14,000 ESG projects across their portfolios and achieved 12.4 percent carbon emissions reductions from 2019. ULI Greenprint real estate members are not slowing their ESG efforts and are continuing to make the business case that sustainability improvements are sound financial investments. Many took advantage of the empty buildings to conduct energy treasure hunts to tune up building systems and implement energy efficiency retrofits, which reduce their carbon footprint and long-term operating costs.

Now, real estate is planning ahead to face the reality of both physical and transition climate risks. It is only a matter of time before assets become stranded not just because of sea-level rise, but also because of climate policies and goals that render a building obsolete.

As you read the *State of Green*, consider how your own portfolio performance compares with this vanguard of global real estate sustainability leaders. We hope that the progress achieved, the projects implemented, and the financial decision-making applied will inspire the market to follow suit in reducing carbon and building value.

Signed,

Marta Schantz, senior vice president, ULI Greenprint Center for Building Performance

The Greenprint Community

Real Estate Members

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



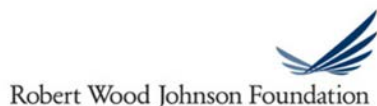
Innovation Partners

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



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:



Long-Term Progress

Each year, Greenprint measures its members' collective progress toward its original commitment of a 50 percent reduction in greenhouse gas emissions by 2030 (relative to a 2009 baseline). In 2020, Greenprint also launched a new goal—net zero carbon operations by 2050.



Long-Term Progress

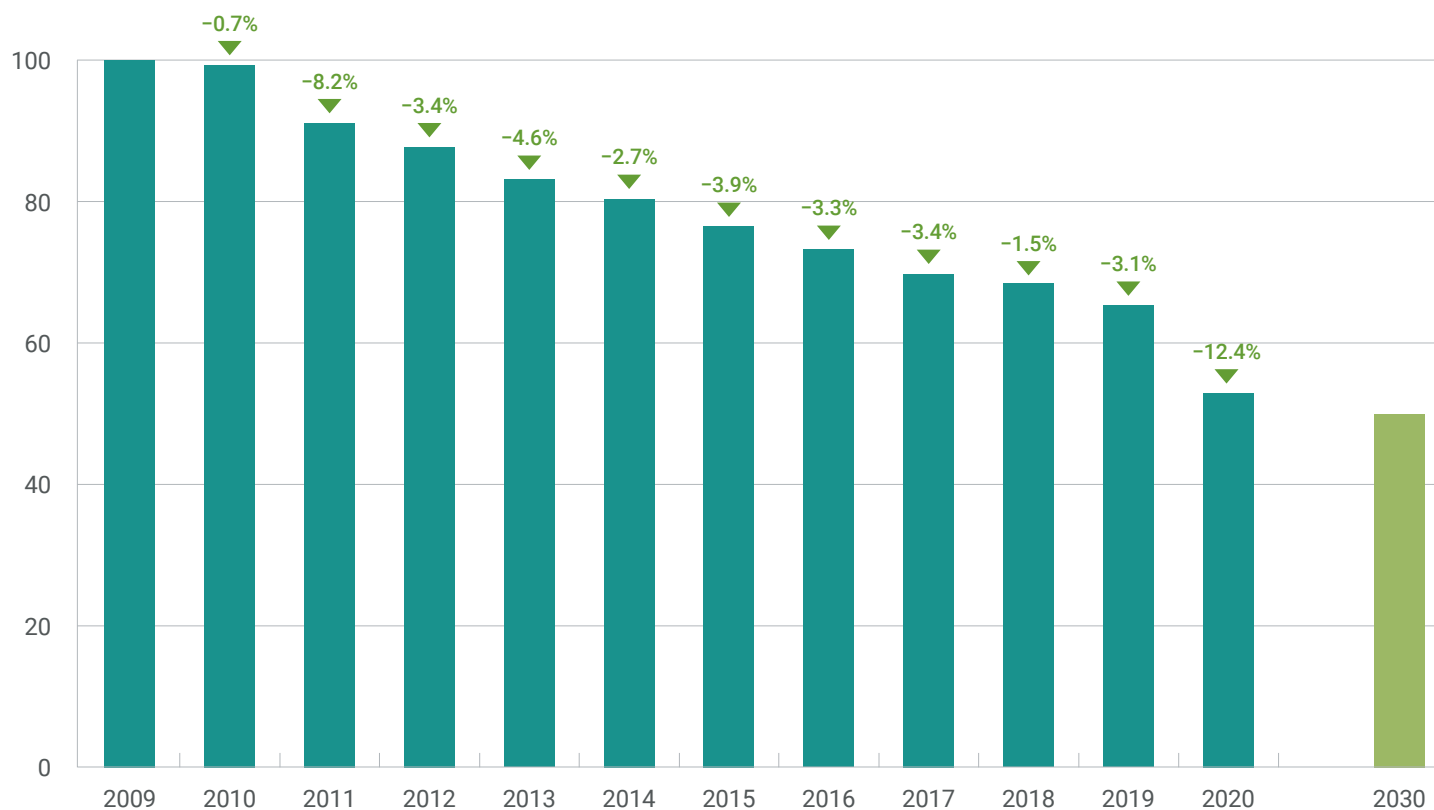
True to form, Greenprint members continue advancing toward the 50 percent by 2030 goal, with a 12.4 percent reduction in carbon emissions from 2019 to 2020, building on past trends averaging 3.5 percent reductions each year. This collective progress is measured by adding year-over-year reductions across like-for-like buildings. As climate risks intensify, reaching this near-term goal remains a critical milestone on the industry’s path to net zero carbon emissions.

Continued progress on decarbonization is not by chance; Greenprint members keep pushing the limits to construct high-efficiency assets, operate buildings at peak performance, and engage stakeholders for

holistic long-term improvements. Building on the leading sustainability practices and strategies that Greenprint member organizations have been implementing since 2009, ULI published a [Blueprint for Green Real Estate](#) for real estate owners and developers looking to create or accelerate a sustainability program of their own.

This year marks the introduction of Greenprint’s goal of net zero carbon operations by 2050, a second target that deepens the commitment of Greenprint members to reducing carbon emissions. This goal will be measured from 2020 onward.

50 PERCENT REDUCTION IN GREENHOUSE GAS EMISSIONS BY 2030



Net Zero Carbon by 2050

ULI Greenprint’s goal of net zero carbon by 2050 aims to reduce the operational carbon emissions of its members’ buildings under operational control to net zero by the year 2050.

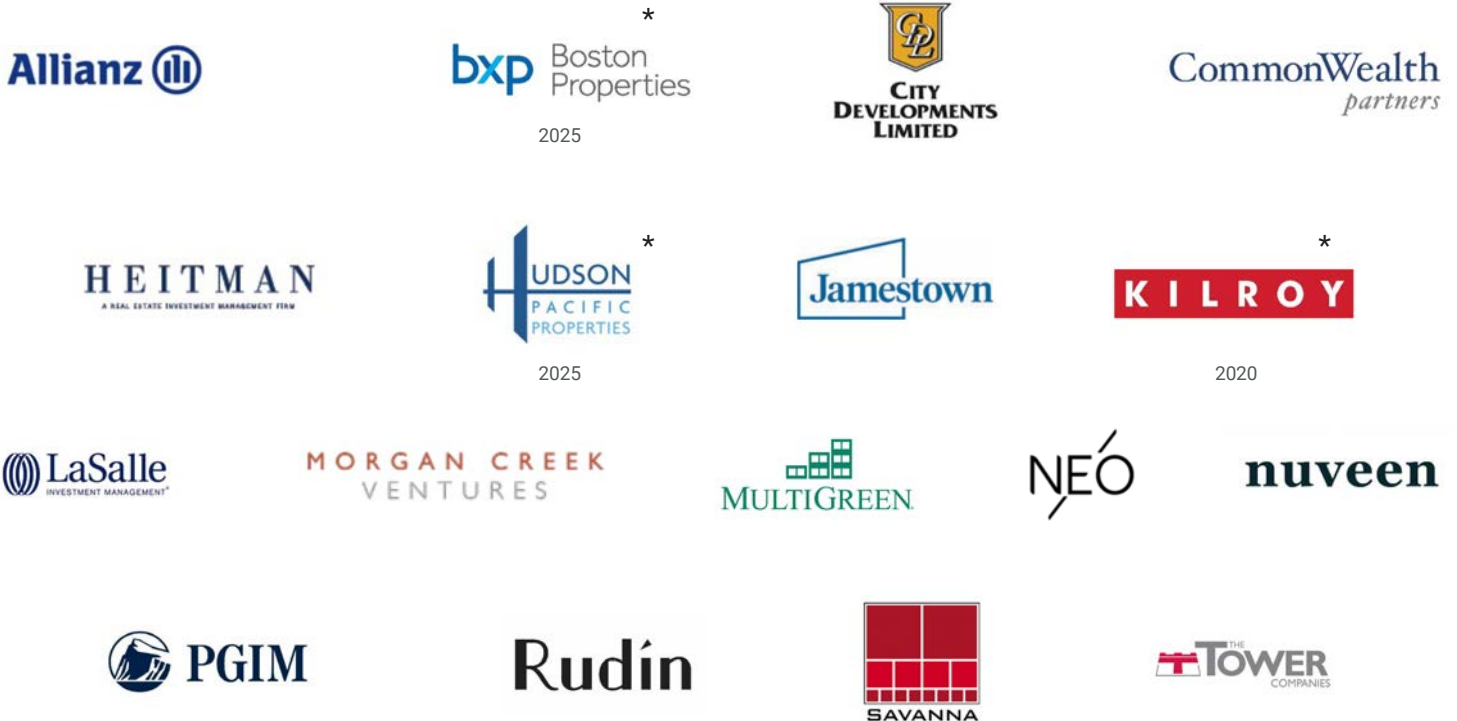


This net zero carbon operations goal is designed to meaningfully reduce the built environment’s impact on climate change and aligns with the World Green Building Council’s definition of net zero: a highly energy efficient portfolio that is fully powered from on-site

and/or off-site renewable energy sources and offsets. The goal is in line with the Paris Agreement and findings from the Intergovernmental Panel on Climate Change report advising that global warming be limited to 1.5 degrees Celsius.

ULI Greenprint will measure members’ progress toward these goals by tracking their collective improvements in energy efficiency, purchase of power from green utilities, and increased investment in on- and off-site renewable energy and offsets.

In October 2020, the inaugural wave of 11 Greenprint members publicly aligned with the ULI Greenprint goal of net zero carbon operations by 2050. In May 2021, a second wave of six Greenprint members aligned to the goal. Collectively, these 17 firms represent over \$570 billion in assets under management (AUM), over 709 million square feet (65 million sq m), and more than 3,300 properties across 20 countries. They are listed here.



Note: Asterisk indicates an organization has already achieved the goal, and (year) indicates an organization has an earlier timeline than 2050.

Collectively, in 2020 the Greenprint members aligned with the ULI goal of net zero who were prepared to report on their progress achieved a net carbon intensity of **35 kilograms of CO₂ per square meter** on the path

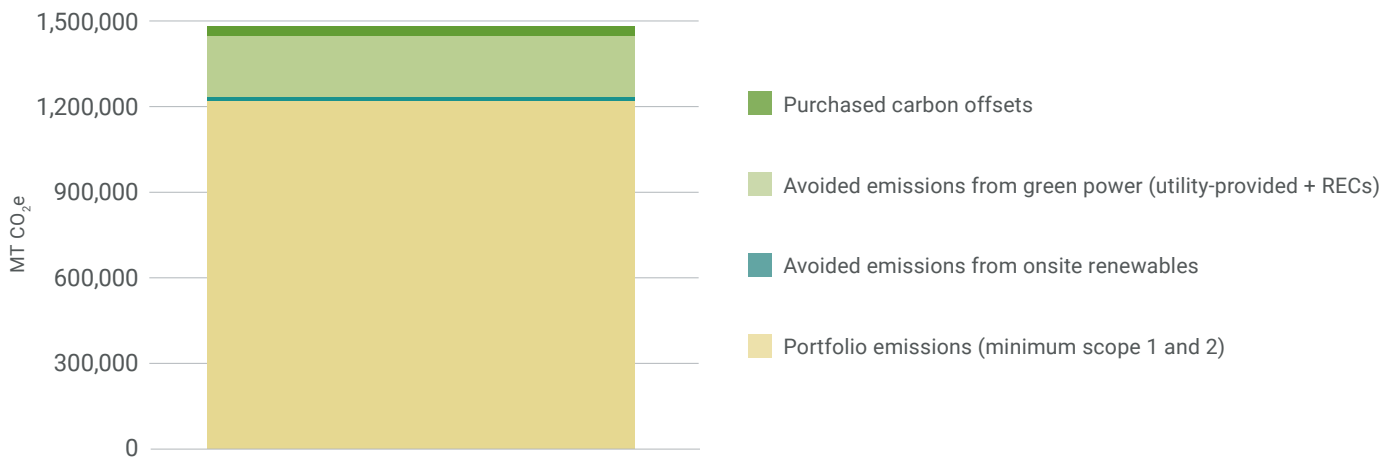
to reaching net zero emissions, using a combination of energy efficiency improvements, on-site renewables, off-site green power, renewable energy certificates (RECs), and purchased carbon offsets.

2020 GREENPRINT NET ZERO CARBON BREAKDOWN

Portfolio emissions	Avoided emissions	Net carbon emissions
1,222,039 MT CO ₂ e 43 kg per m ² 1,541 assets 28,657,314 m ²	256,062 MT CO ₂ e 9 kg per m ²	994,777 MT CO ₂ e 35 kg per m ² (Total emissions minus on-site solar, off-site green power, RECs, and purchased offsets)

Note: Net carbon emissions in kg per m² do not exactly equal portfolio emissions minus avoided emissions due to rounding.

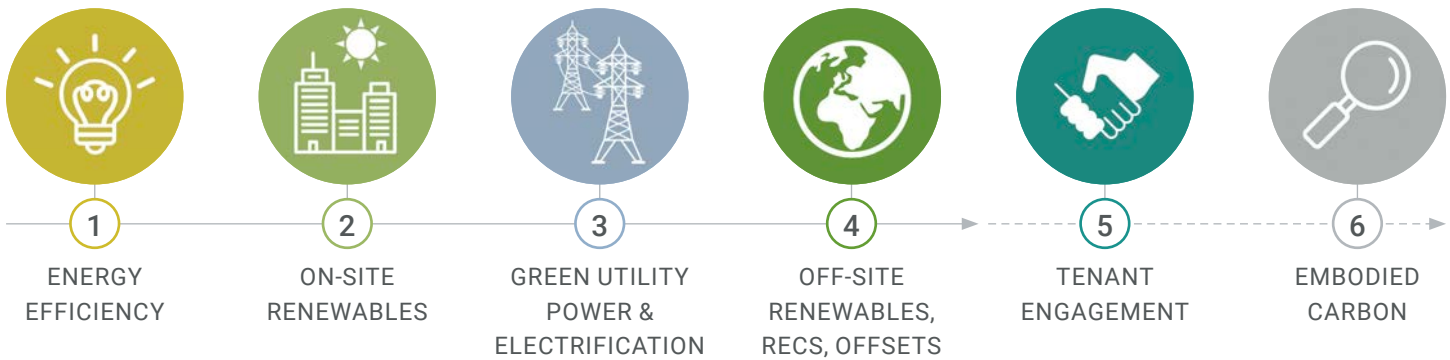
2020 GREENPRINT REPORTED CARBON EMISSIONS EMITTED AND AVOIDED



The net zero goal is based on CDP (formerly the Carbon Disclosure Project) scope 1 and 2 greenhouse gas emissions and direct operational control excluding occupant operations. Members can choose to go beyond scope 1 and 2 to include occupant operations.

It is important to recognize that carbon emissions from tenant energy use and from embodied carbon from building materials will also need to be reduced over time.

ULI GREENPRINT JOURNEY TO NET ZERO CARBON OPERATIONS



The industry is still in the early stages of determining how to track progress toward net zero. Many companies are still deciding what reaching net zero means to them and how to measure their portfolio’s goal of net zero, such as whether or not to include scope 3 emissions in accounting, and therefore accounting methods can differ across member companies. This is the first year members are beginning to report against this goal; the analysis process for this goal will be further refined and standardized in coming years as discussions around data collection for net zero evolve.

Energy efficiency is an essential first step toward reaching net zero, since it lowers the amount of carbon emissions companies need to avoid or offset through renewables, green power, and carbon offsets. Greenprint members’ energy efficiency improvements are technically reflected in portfolio emissions, are

tracked specifically through the Greenprint goal of 50 percent reduction by 2030, and are therefore not explicitly highlighted in the net zero goal figures.

Greenprint members made the biggest strides toward net zero by acquiring utility-provided green power and buying RECs. The smaller reductions from on-site renewables reflect current challenges of on-site power generation and the significant potential for utilities and off-site power purchase agreements to meet demand for low-carbon electricity; the smaller reductions from carbon offsets reflect the uncertainty in value of those purchases.

Future reporting on this goal will indicate changes in carbon intensity and the breakdown of avoided and emitted emissions each year.



Annual Results: 2019–2020

Yearly results track the Greenprint portfolio's performance on sustainability. Members also report the types and counts of ESG projects they implement and the green building certifications they achieved. Last year saw improvements across each of these categories.

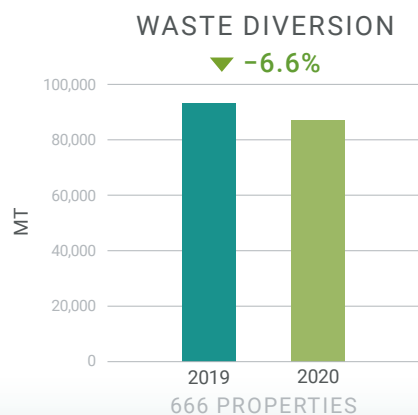
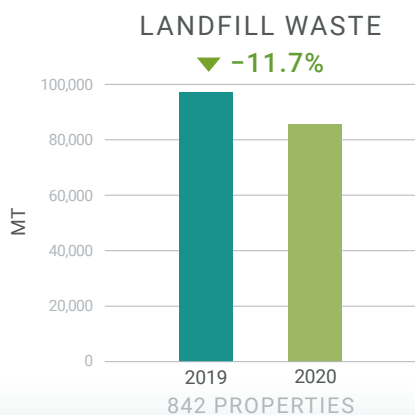
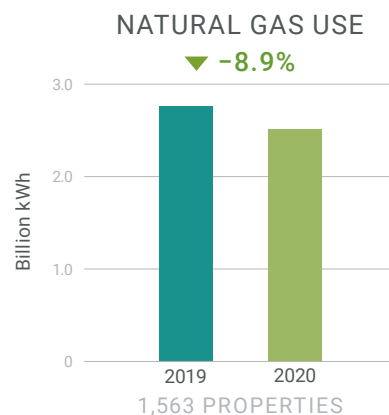
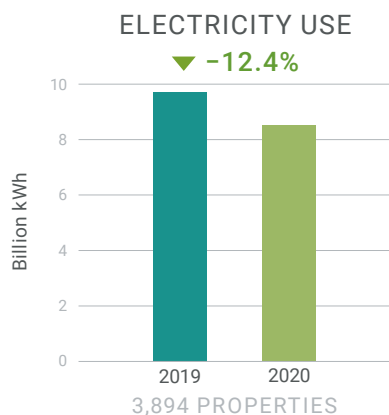
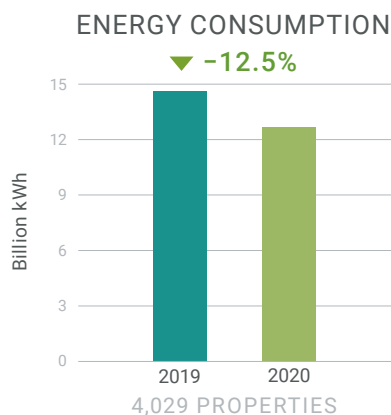
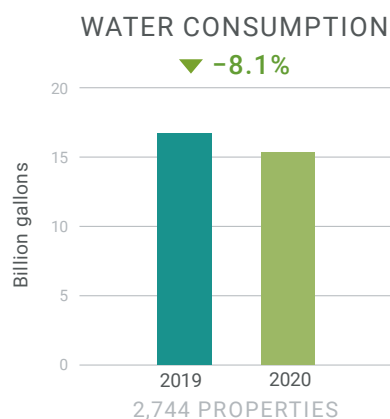
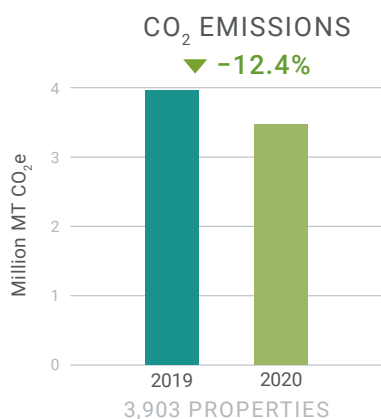


2019–2020 Year-over-Year Performance

From 2019 to 2020, Greenprint members’ collective global portfolio continued to reduce energy and water use, waste generation, and carbon emissions year over year, as shown in the following figures.

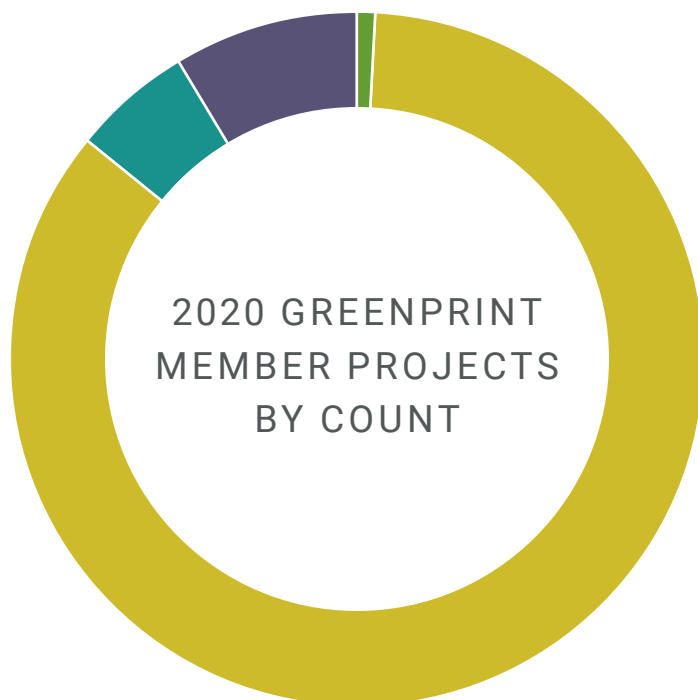
This year the Greenprint portfolio’s reductions were much larger than in prior years, likely owing to impacts of the COVID-19 pandemic resulting in lower use of office and retail properties, particularly in major markets where Greenprint member buildings are clustered.

GREENPRINT PERFORMANCE SNAPSHOT, 2019–2020



2020 ESG Project Breakout

Many owners found office and retail assets largely unoccupied in 2020, which seemed to encourage a significant increase in the number of ESG projects implemented over 2019 levels. Whereas in 2019 Greenprint members reported only 6,122 ESG projects



across carbon, energy, waste, and water, in 2020 members reported more than double that for a total of 14,793 projects. Total reported 2020 ESG project investment surpassed \$86 million. As in past years, Greenprint members prioritized energy projects, which represented over 85 percent of total ESG projects.

By property type:

- Projects in offices primarily focused on waste management, and secondly on installation of high-efficiency lighting and HVAC equipment.
- Industrial properties also implemented a large number of high-efficiency lighting and building envelope upgrades.
- Projects in multifamily properties were evenly split between high-efficiency lighting, recycling management, and water conservation projects.

Additional consequences of the COVID-19 pandemic affecting real estate operations, such as enhanced ventilation or pursuit of health and wellness certifications, were explored in [A Transformative Year: Impacts of 2020 on Real Estate](#), a survey of building owners and managers about the practices they adopted. Over 50 percent of survey respondents anticipate equipment measures spurred by the COVID-19 pandemic (e.g., MERV-13 filters, air quality testing) to remain in the building permanently.

COUNT	TYPE	INVESTMENT
70	Carbon	\$18,088,408
12,629	Energy	\$64,848,003
834	Water	\$3,377,040
1,260	Waste	\$14,732

Note: Not all Greenprint-reported projects included data on cost; thus the project-related cost numbers in this report under-represent total investments.

Many Greenprint members also continued to implement social equity practices in 2020, whether through enhanced community engagement, partnerships with local institutions, workforce development initiatives, or direct provision of resources, highlighting the S in ESG. [Health and Social Equity: Examples from the Field](#) showcases how many owners, including a number of Greenprint members, were addressing health and equity issues both before and during COVID. This trend is also likely to continue as more companies develop initiatives to address the equity and racial divide that came to light in 2020.

Many of these projects also help Greenprint members that have aligned with the UN Sustainable Development Goals (SDGs) meet these commitments and enhance their impact. [Global Goals: A Primer on the U.N. Sustainable Development Goals for Real Estate](#) explains the business case for adopting the SDGs, including demonstrating global leadership, meeting investor demand, and attracting new investments.

2020 Green Building Certification Breakout

As interest in sustainable real estate grows, demand is rising from all stakeholders for buildings that can demonstrate verifiable high performance in energy, carbon, water, waste, and health and well-being. Research shows that certified green buildings command higher rents, sell and lease faster, and improve employee productivity, in addition to their environmental benefits.

The COVID-19 pandemic did not slow progress in building certifications: in fact, 2020 showed tremendous growth in this area, with the total number of building certifications achieved quadrupling from 2019 to 2020, concentrated mostly in industrial, office, and residential properties.

meters, compared with 2.9 million square meters in Europe and 1.9 million square meters in Asia (these totals, unlike those presented by property type or region, have accounted for the fact that some buildings or spaces may have achieved multiple certifications and counted them only once).

Energy Star certifications rose in prominence in the Americas, though LEED (Leadership in Energy and Environmental Design) remained the most common all-around sustainability certification. As in previous years in Europe, BREEAM claimed the majority of new certifications, while in Asia Pacific NABERS (National Australian Built Environment Rating System) claimed the top spot in number of new certifications, although Japan-based CASBEE (Comprehensive Assessment System for Built Environment Efficiency) remained the most common certification by floor area.

2020 GREEN BUILDING CERTIFICATIONS BY PROPERTY TYPE AND COVERAGE

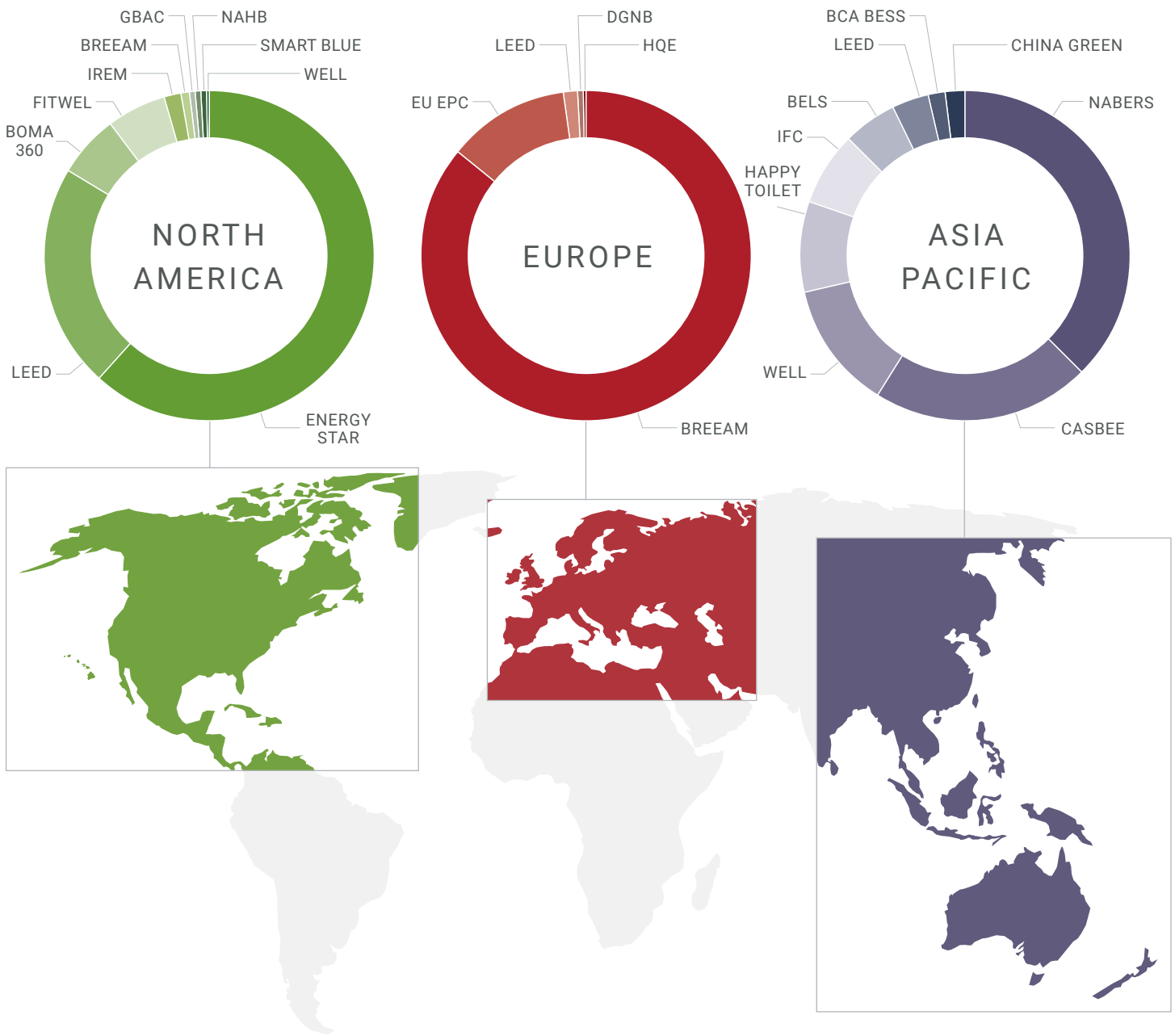
Property type	Count certified in 2020	Reported area coverage (m ²)
Industrial	777	4,226,718
Office	629	20,174,654
Residential	137	2,744,053
Retail	40	879,590
Self-storage	34	548,745
Other	8	401,711

Bucking the trend, in 2020 industrial properties surpassed office properties in number of certifications achieved in the Greenprint portfolio, though not in square footage. This change was driven by a high number of industrial properties achieving BREEAM (Building Research Establishment Environmental Assessment Method) certification in Europe.

Greenprint members reported 1,625 green building certifications awarded across 25 countries (up from 18 countries in 2019). Though the Americas region represents the widest range of certifications achieved, Europe outstripped all regions in number of certifications awarded. However, the Americas had far more building area certified: 19 million square

As expected, certifications focused on health and well-being increased from 2019 to 2020, with over three times the number of Fitwel certifications achieved in 2020. Fitwel was much more common than WELL among Greenprint members, with only eight buildings awarded WELL certification in 2020. The trend toward health-centered certifications is likely to continue because of the demand for healthy buildings, rapidly accelerated by the COVID-19 pandemic.

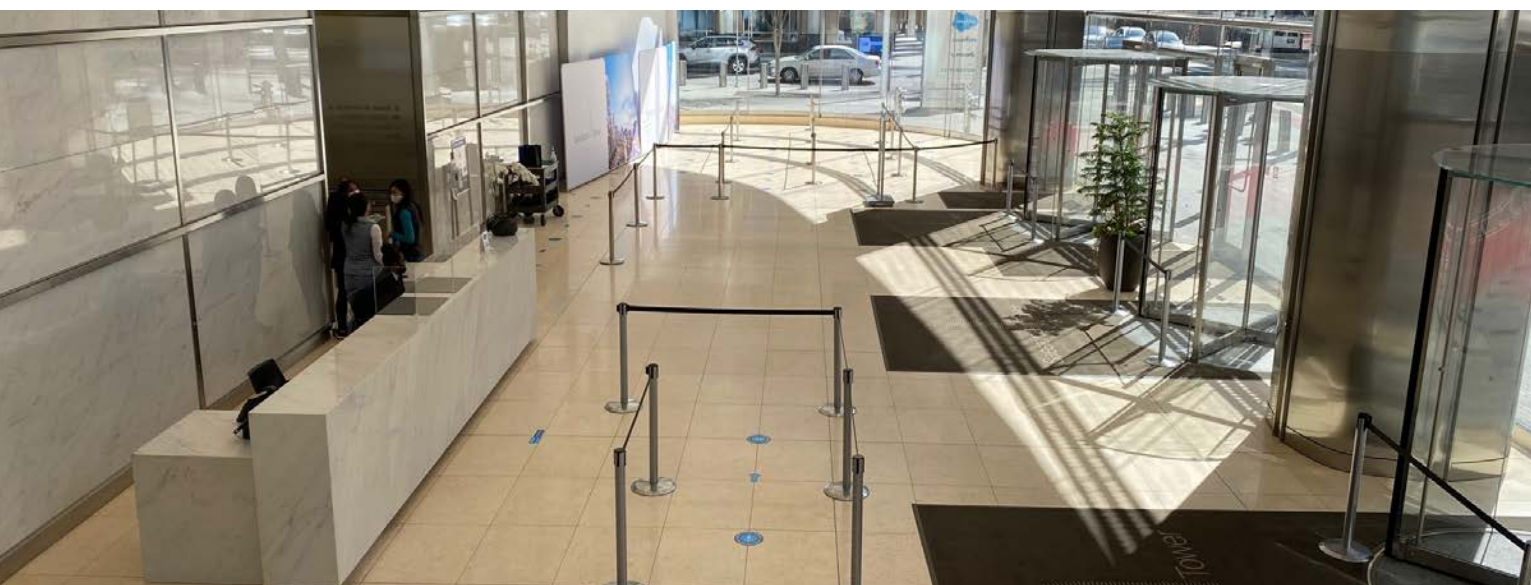
2020 GREEN BUILDING CERTIFICATIONS, BY REGION AND COUNT



Project Profiles in Sustainability

Every year, Greenprint members complete a diverse array of projects that drive improvements in all aspects of sustainability, including both the decreases (carbon emissions, energy use, water, and waste) and increases (improved tenant health and well-being, biodiversity, and asset value) the industry is aiming for. In 2020, many of these projects reflected members' enhanced focus on responding to the COVID-19 pandemic and the rising momentum for adopting net zero goals.

Establishing Health Security and Sustainability across BXP's Portfolio



COVID-19 social distancing signage in use.

As developers, owners, and managers of premier office buildings, Boston Properties (BXP) is keenly aware of the influence of buildings on human health. The COVID-19 pandemic intensified stakeholder focus on healthy buildings, elevating the importance of developing and maintaining healthy, high-performance buildings, while simultaneously mitigating operational costs and the potential negative externalities of energy, water, waste, carbon emissions, and climate change.

In 2020 BXP convened a Health Security Task Force of internal and external healthy building experts to develop and implement a comprehensive Health Security Plan for the repopulation of its properties, placing the health, safety, and security of customers, employees, service providers, partners, and communities as the highest priority.

The Health Security Plan considers five main focus areas: air and water quality, physical distancing, cleaning, pandemic-ready provisions, and communications. Many of the attributes address sustainability broadly in addition to health security, for example:

- Increase ventilation and provide 100 percent outside air when and where possible;
- Replace and improve filtration (MERV-13 minimum);

- Augment filtration with high-efficiency particulate air (HEPA) portable filters in conference rooms, cafés, and fitness amenities;
- Perform comprehensive inspections, air and water quality testing;
- Maintain and improve high-quality HVAC systems, and continuously monitor space temperature set points across the portfolio with advanced building management systems;
- Facilitate employee contact tracing, screening of employees and contractors, and enhanced tenant communication;
- Develop and maintain green buildings using materials that support healthy, productive indoor environments;
- Increase adoption of touchless systems and increase frequency of cleaning and disinfection of high-touch surfaces to reduce transmission opportunities; and
- Use Green Seal products and HEPA vacuums to minimize the impact of cleaning products on people and the environment.



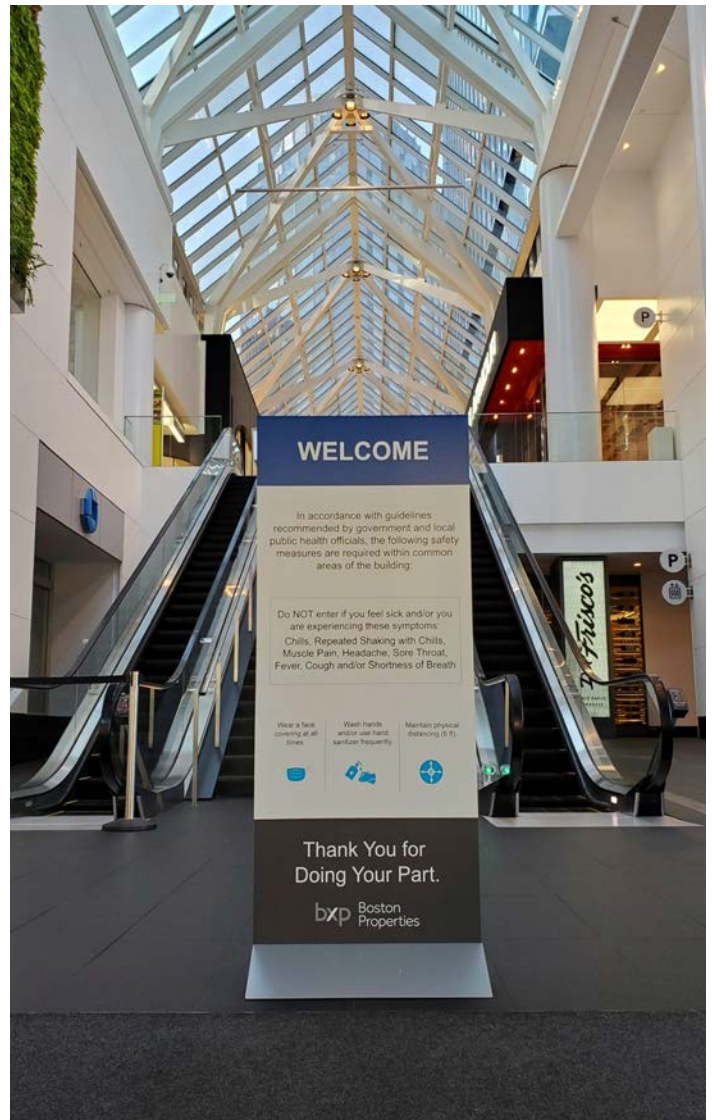
“The COVID-19 pandemic revealed the remarkable potential we have to adapt, innovate, and come together to support the measures necessary to create a better tomorrow. The health security of our customers and employees remains a top priority for BXP. We will continue to demonstrate our commitment and capacity to conduct our business in a manner that contributes to positive economic, social, and environmental outcomes for our customers, shareholders, employees, and the communities we serve.”

—Ben Myers, vice president, sustainability, Boston Properties

Some positive healthy building attributes can negatively affect environmental performance, such as how increased ventilation may increase a building’s energy consumption. BXP has addressed this concern by assessing ventilation rates across the portfolio, adjusting ventilation to coincide with increased occupant density and favorable weather conditions, and actively monitoring air quality.

Healthy buildings are not a new concept for BXP—the company conducted its first healthy building assessment in 2016, became a Fitwel Champion in 2019, and was named a 2020 Best in Building Health award winner. In 2020, BXP received Fitwel Viral Response enterprise-level certification. This module incorporates strategies that create healthy indoor environments and mitigate viral transmission. BXP’s entire actively managed office portfolio received asset-level Fitwel Viral Response certification in 2021.

BXP’s sustainability policies, practices, and projects are aligned with the direction set by the U.N. SDGs. This includes SDG 3, good health, and well-being, to ensure indoor environments provide exceptional air quality and thermal comfort. The company’s efforts include providing employees with programs and benefits that support health and wellness, communicating health security measures to customers and the public, aligning design and operational practices with leading healthy building rating systems and expert guidance, and pursuing third-party healthy building certifications.



BOSTON PROPERTIES

In 2020, BXP produced and installed over 30,000 signs to engage building occupants and promote the shared responsibility of health security.

Net Energy Producer at Prologis's Netherlands DC4 Logistics Property



PROLOGIS

Prologis Eindhoven DC4, showing entrance from left and solar bike shed.

Surpassing goals of net zero carbon emissions, in 2020 Prologis completed construction on the Eindhoven DC4 warehouse not only to meet net zero energy but also to be a net energy producer. Located in Eindhoven, the Netherlands, the warehouse is completely electric powered, fitted with high-efficiency building systems, and includes a rooftop 2.94-megawatt photovoltaic (PV) system in place for generating solar power. The combination of these components allows the property to maintain a net zero carbon output by generating more renewable energy than it consumes. The building is in line with Prologis's new 2020 goal to have 100 percent of its developments across the globe achieve

sustainable building certifications, by achieving BREEAM Outstanding certification for both the design and new construction delivery.

The development aims to inspire and set the standard for future developments worldwide, both at Prologis and beyond. Establishing a low carbon footprint with low energy costs for an industrial, logistics building of 39,266 square meters was the biggest design challenge. Overcoming this obstacle, paired with Prologis's efforts to expand renewable energy in its operating markets across 19 countries, stimulated new ways to envision the longevity of real estate.



“Eindhoven DC4 is a future-proofed building that will continue to add value for future generations, to the natural environment, the community, and the economy.”

—Martjin Kuijken, director of project management, Prologis Benelux



Prologis Eindhoven DC4, showing inside of solar bike shed.

Integrating high energy efficiency standards into a workspace centered around tenant health and well-being led to a unique and flexible building design equipped with innovative technology. Eindhoven DC4 is fitted with energy efficient heat pumps, high-grade insulation, smart building controls, and triple-pane windows. The all-electric solution for heating and cooling systems eliminates scope 1 emissions while providing a comfortable indoor climate. The project will save approximately €100,000 (US\$119,000) annually on energy costs through use of the all-electric system in place of a natural gas-burning one. In addition to roof-mounted solar panels, the site includes building integrated PV panels in the glass canopy above the entrance and a translucent PV panel-roofed bicycle shed that provides e-bike chargers.

PROLOGIS



Prologis Eindhoven DC4, showing entrance and solar bike shed.

PROLOGIS

Prioritizing Building Optimization and Energy Efficiency at Multiple Goldman Sachs Properties



GOLDMAN SACHS

In Newport Beach, 895 Dove achieved \$53,000 annual savings on electricity and a 23 percent yield on cost through building optimization.

Through building optimization, Goldman Sachs Asset Management has been able to find ways to increase property value and reduce costs while helping mitigate climate change. Two properties that exemplified these efforts in 2020 are 895 Dove and 2001 Broadway.

When the property management team and a retro-commissioning vendor analyzed 895 Dove in Newport Beach, California, they found extensive opportunities to save energy and reduce carbon emissions. This included airside economizer repairs, compressor efficiency restoration through chemical treatment, and advanced HVAC controls such as variable air volume (VAV) box set point

adjustments, duct static pressure control improvements, and weather-based hot water system lockout. For the 107,500-square-foot office building, these improvements resulted in a verified \$53,000 annual savings in the electricity bill from a 436 megawatt-hour (MWh) electricity use reduction and 121 tons avoided carbon emissions with a 23 percent yield on cost (YoC).

The same building optimization process was applied to 2001 Broadway, a 59,000-square-foot mixed-use retail and office building located in Oakland, California, and the team identified \$19,000 per year of verified savings. This equaled 79 MWh of electricity savings and 42 tons avoided carbon emissions with a 10 percent



“We are highly focused on identifying those initiatives that reduce energy usage and operating cost at our properties, which increases asset value and resiliency. The positive impact on valuation can justify a great deal of investment in energy use reduction efforts, which can have a meaningful impact on reducing our carbon footprint. The initiatives at 895 Dove and 2001 Broadway are examples of how we are constantly learning of new ways to accretively improve the efficiency of our assets and apply those learnings to our scaled framework.”

—Joseph Sumberg, managing director, Goldman Sachs Asset Management



GOLDMAN SACHS

The building at 2001 Broadway in Oakland achieved \$19,000 annual savings on electricity and a 10 percent yield on cost through building optimization.

YoC. This was accomplished through LED retrofits and optimal start controls, as well as isolating zones that are unoccupied. In this building, the same HVAC system served both retail space that was open on weekends, office tenants with regular eight-to-five hours, and office tenants who worked extensive after hours. Reducing the heating and cooling to unoccupied zones was a great initiative for this mixed-use building.

Across the two properties, these building optimization projects are expected to generate about \$1.1 million in savings over the next 10 years. The findings from these buildings have also helped refine an ESG framework to take the most frequent and highest impact initiatives and implement them across the entire Goldman Sachs portfolio. For example, the framework ensures every property across the portfolio evaluates whether it can implement optimal start or other advanced controls, as well as a variety of other environmental and social initiatives.

Holistic ESG Development with Biophilic Design at Green Cities' Bower Property



THE GREEN CITIES COMPANY

Bower, by the Green Cities Company, earned LEED Gold and a two-star Fitwel certification through biophilic design.

Bower, the Green Cities Company's new multifamily property in Boston, opened for leasing in the third quarter of 2020 and prioritized resident health and well-being through biophilic design as a key part of its holistic ESG strategy. The two-building, 412,000-square-foot property with 312 apartments is LEED Gold certified and received a two-star Fitwel certification, earning 100 percent of points possible in the Location, Indoor Environment, Dwellings and Shared Spaces categories in addition to being recognized as a 2021 Fitwel Best in Building Health award winner.

From the earliest design phase, the Green Cities Company cultivated a lifestyle experience that is nurturing to human and environmental well-being, with biophilic experiences integrated throughout the building:

- Interior architecture, architectural finishes, artwork, and furniture reference and/or mimic patterns found in nature.
- An indoor atrium connects residents to the outdoors.
- Live and healthy plants flourish indoors and out.
- View Smart Windows control glare and thermal comfort while providing occupants a constant connection to the outdoors and natural light.
- Spacious amenity rooms with tall ceilings provide a relief from indoor limitations.
- Artwork and skylights offer opportunities to experience wonder.



THE GREEN CITIES COMPANY

Daylighting design promotes occupant well-being.



“Bower represents how the Green Cities Company holistically integrates environmental responsibility with biophilic design and health and well-being to support sustainable, healthy living at our properties. Nature-based design inspires our residents, enhances our properties, and elevates our communities.”

—Renee Loveland, director of ESG, the Green Cities Company



THE GREEN CITIES COMPANY

Living plants and artwork enhance interior environments.

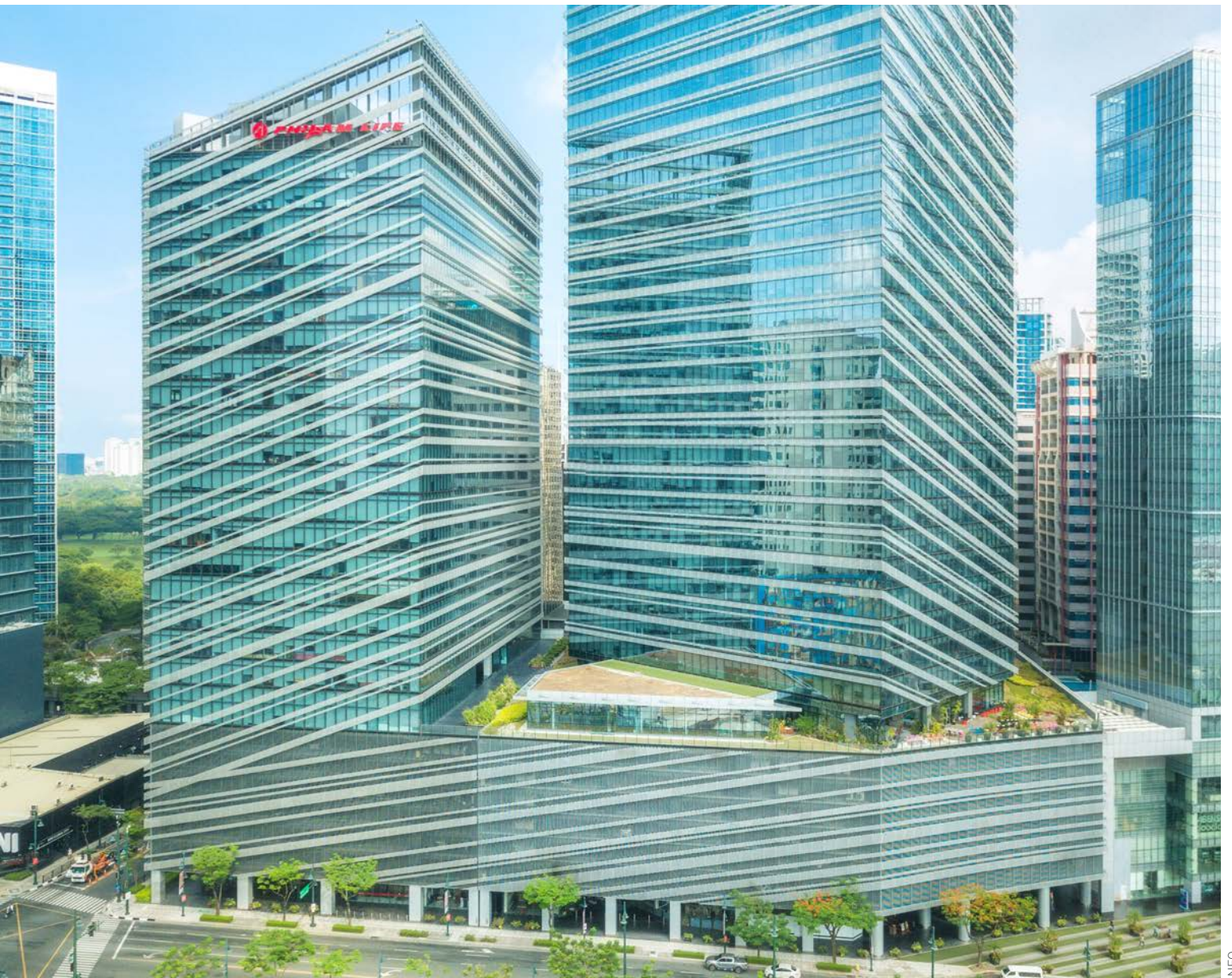
The Green Cities Company’s ESG framework evaluates an array of material impacts categorized into five key pillars: environmental impact, climate change mitigation, resilience, health and well-being, and equitable communities. In addition to biophilic design, Bower features a holistic suite of environmental and health and well-being strategies:

- The apartments feature Energy Star-rated appliances.
- High-quality and nontoxic FloorScore-certified flooring, cabinetry, and countertops do not off-gas contaminants into the air.
- Stairwells are designed and strategically placed to promote their use.

- Resident programming includes a Community Supported Agriculture dropoff, curated resident events, free green cleaning products, and expanded recycling options.
- A 75-kilowatt co-generation turbine produces electricity on site.
- There are 160 bike parking spaces, including a bike repair and wash station.
- The property has 10 electric vehicle charging stations.

The highly efficient building uses 21 percent less energy (which equates to 32 percent energy cost savings), uses 33 percent less water, and reduces irrigation demand by 83 percent compared to a conventional multifamily property. Projected operational cost savings related to these efficiency strategies is just under \$300,000 annually.

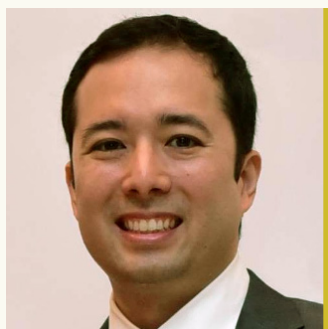
NEO Meets Net Zero Goal through Green Power Procurement



Six and Seven NEO, fully powered by geothermal utility energy.

NEO, an owner, developer, and manager of office buildings in the Bonifacio Global City in the Philippines, set a portfolio-wide goal to achieve net zero carbon operations and achieved it in 2020 by powering its assets with 100 percent green utility power. NEO's portfolio comprises seven office towers and encompasses 2.92 million square feet. The firm's overall dedication to and drive toward a net zero carbon future is reflected in its portfolio-wide strategy.

In line with the ULI Greenprint net zero and the World Green Building Council definitions, NEO defines net zero as a building portfolio that is highly efficient and fully powered by on-site and off-site renewable energy sources. In addition to starting with a highly efficient and all-electric portfolio, NEO leveraged green power procurement as a key pathway to achieve net zero.



“In line with our commitment to net zero, we are proud to be pilot partners for the Advancing Net Zero Philippines program of the Philippine Green Building Council, which will officially be launched in 2021. Green power procurement is fundamental to the real estate industry’s journey toward net zero.”

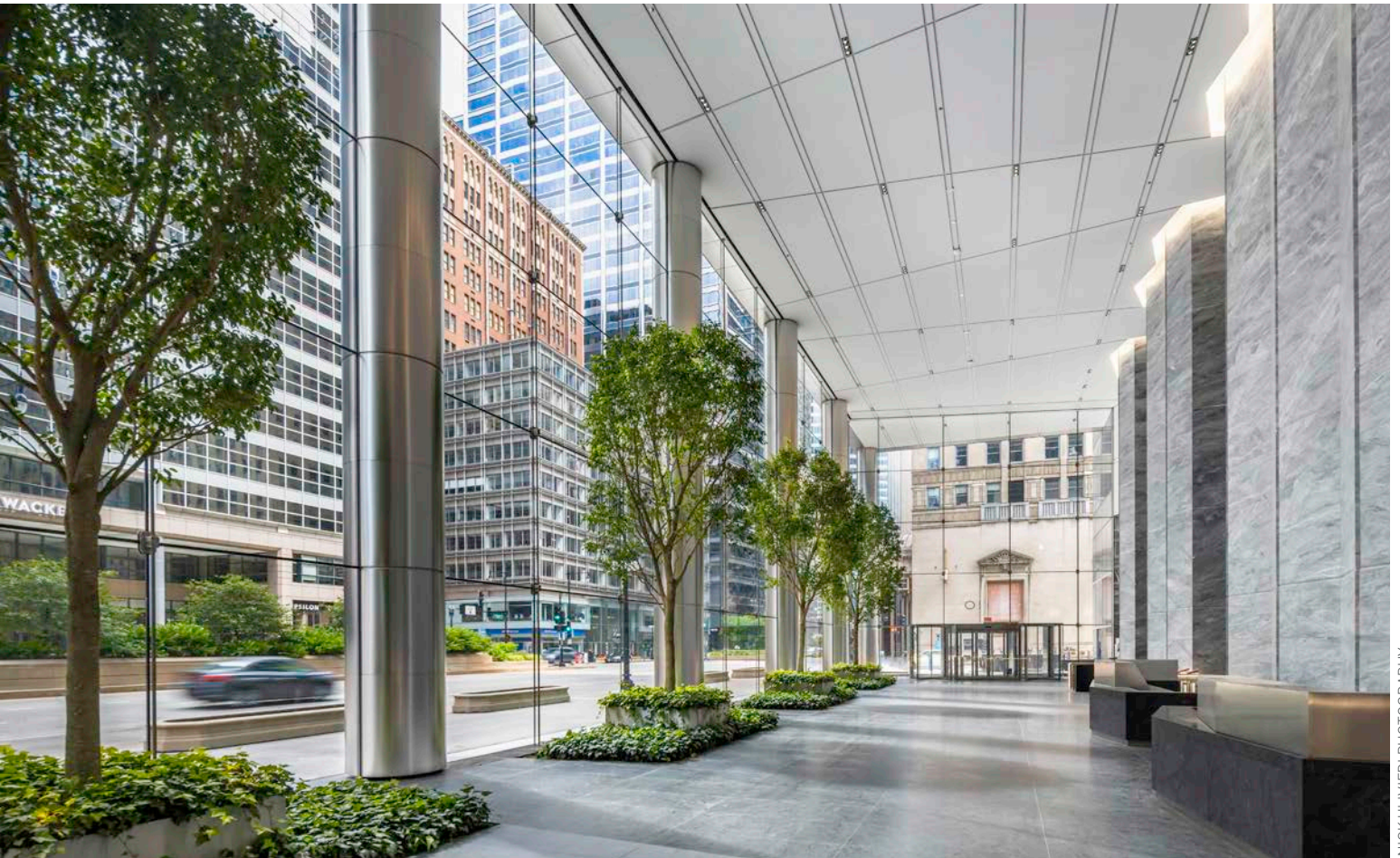
—Raymond Rufino, chief executive officer, NEO

NEO is sourcing and using renewable energy as the main power source for its buildings through a purchase power agreement. AboitizPower Cleanergy, through its MakBan Geothermal Power Plant, provides NEO with green and reliable energy and continues to be one of the company’s key partners. In 2020, the portfolio consumed just over 52 million kilowatt-hours of energy with 100 percent of its total energy coming from 14.5 megawatts of geothermal power. The green power procured came at no cost premium to the portfolio owners and tenants. To date, the firm has achieved Five Star Net Zero Energy certification for three of its buildings under the Advancing Net Zero Philippines pilot program of the Philippine Green Building Council.

Each of NEO’s office buildings is rated five stars under the Building for Ecologically Responsive Design Excellence certification system and won outstanding awards from the Philippine Department of Energy during the 2020 Energy Efficiency Green Building Awards. Showing further dedication to high-performance building operations, NEO also prioritizes tenant engagement for sustainability through its #theNEOway programs and events.

In 2021, NEO hopes to achieve Net Zero Energy Certification for its remaining four buildings to become the only Philippine real estate company with its entire portfolio certified as net zero.

Howard Hughes’s Sustainability Stewardship at 110 North Wacker Drive



NICK ULIVIERI PHOTOGRAPHY

110 North Wacker Drive is certified both LEED Gold and WELL Platinum.

Completed in 2020, 110 North Wacker Drive—Chicago’s tallest office building delivered in the past three decades—achieved LEED v4 Gold and WELL Platinum certifications. The Howard Hughes Corporation’s (HHC) 1.5 million-square-foot office building provides market-leading amenities, design, and technology that ensures quality engagement and health of occupants.

HHC sought out prominent local collaborators, Goettsch Partners and Riverside Development, to transform a brownfield site that was inherently logistically challenged and deliver a building designed to optimize its walkable downtown riverfront location. The team found opportunities for innovative solutions, created a unique trapezoidal site plan, and integrated sustainable practices and strategies throughout development.

Collaborating with historical preservation authorities, the property team was able to salvage and repurpose existing stainless-steel panels from the previous building on the site. In addition, 90 percent (nearly 20,000 tons) of construction waste was diverted for recycling and reuse. Forest Stewardship Council–certified wood and regionally manufactured and recycled materials were also used in construction. The property achieved a significant reduction in water usage, saving 4.7 million gallons of water annually from water-conserving amenities and appliances in addition to plumbing fixtures that use 37 percent less water than the national standard.

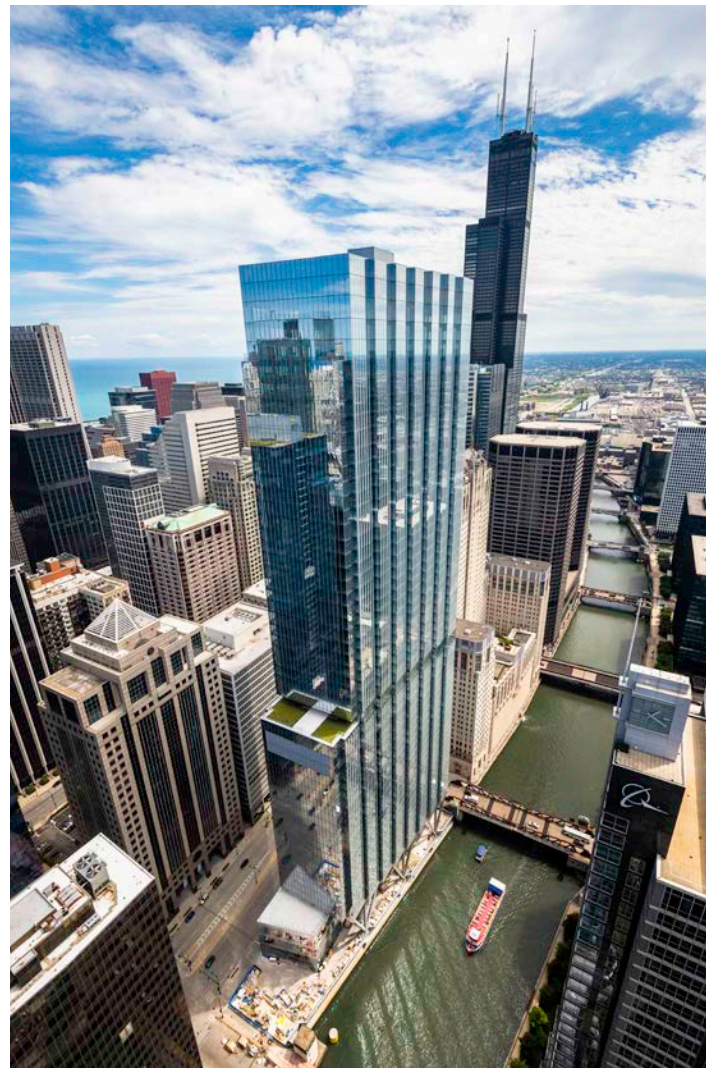


"Being situated on the Chicago River comes with a responsibility to be an innovative steward of the natural and urban environments. From pre-construction to facility management, we prioritized efficiency of resources and waste mitigation while emphasizing occupant well-being, quality customer experience, and high-technology infrastructure to maximize overall health and wellness throughout the building—elements that have remained key to our developments since before the pandemic put these issue front and center."

—Gautami Palanki, vice president of sustainability, Howard Hughes Corporation

Promoting tenant engagement, 110 North Wacker individually submeters each tenant to monitor its energy use and make data-based decisions to conserve resources. Tenants and visitors alike are invited to take part in a Green Energy Program to learn about the actions they can take to deliver high performance and lower emissions. The building has achieved 18.17 percent energy cost savings from these methods in addition to the use of energy-saving HVAC equipment and energy-efficient lighting in the base building and tenant spaces. Through these strategies the property is anticipated to lower emissions by 53 percent compared to a median building.

Moreover, HHC's Green Cleaning Policy addresses the use of green cleaning products, sustainable cleaning equipment, and other environmental best practices to effectively maintain a satisfactory standard of disinfection and cleanliness at 110 North Wacker while protecting both the environment and the health of people in that environment. An ionization air purification system was installed in the building, which produces positive and negative ions that attach to particles and pathogens in the indoor air where they combine, enlarge, and are more easily filtered from the air. These strategies, in combination with the building's overall sustainable design, provide nearly 3,600 building occupants a higher quality of interior space, positively affecting productivity, health, and wellness.



NICK ULIVIERI PHOTOGRAPHY

The property is anticipated to lower emissions by 53 percent compared to a median building.

Deep Dive on Performance

Greenprint benchmarks thousands of buildings' performance on carbon, energy, water, and waste every year to generate insight on industry trends; 2020 saw strong reductions in all categories across nearly all property types.

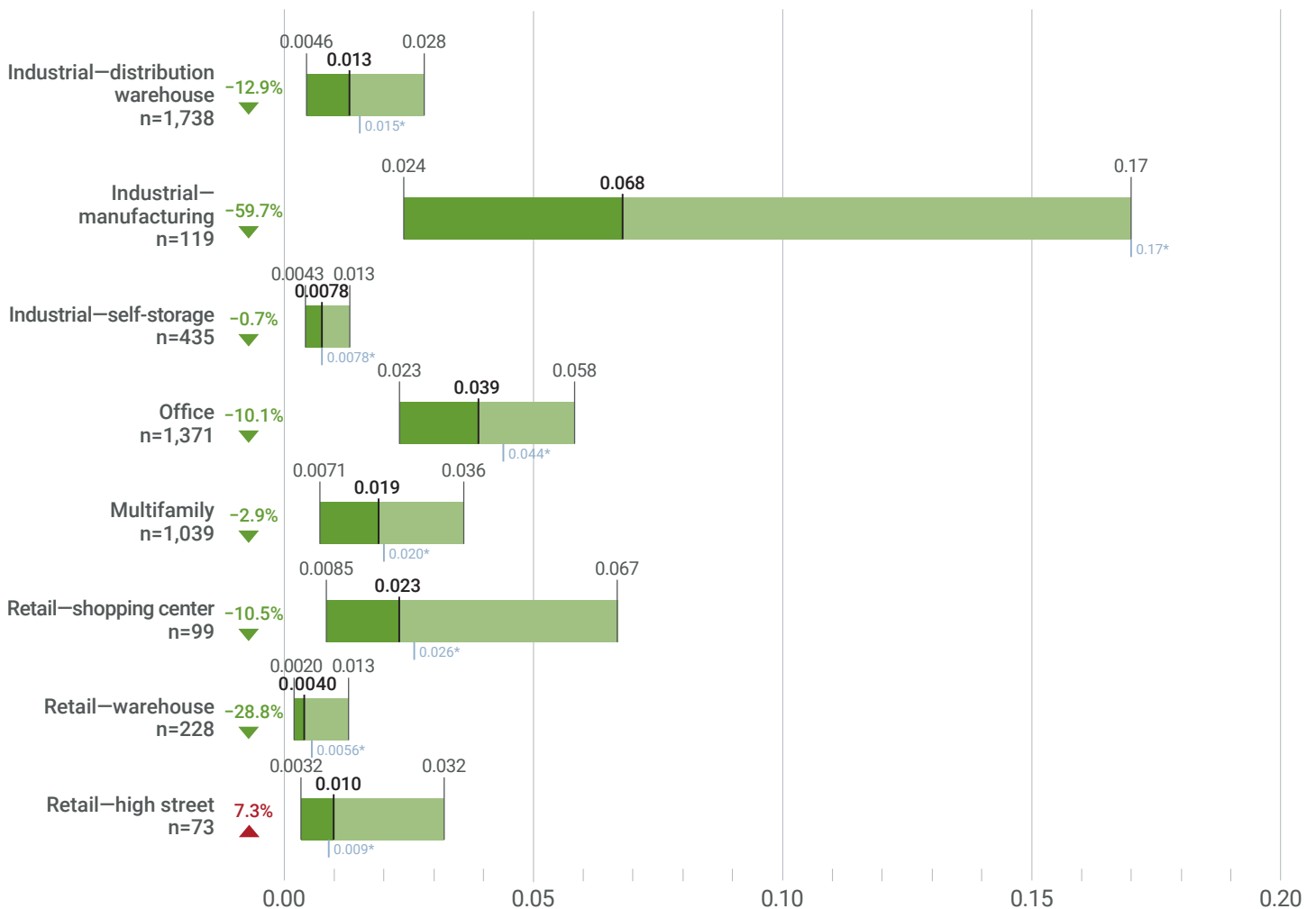
Carbon

The stakes for reducing emissions continue to rise as this decade progresses: the years remaining until 2030 are critically important for keeping global warming below 1.5 degrees Celsius. Globally, emissions dipped briefly during the COVID-19 pandemic but rebounded quickly as 2020 progressed, and the International Energy Agency [predicted](#) in July 2021 that they may hit record levels by 2023.

Carbon Emissions by Building Type

Carbon emissions by building are closely tied to energy use, with energy-intensive industrial-manufacturing properties showing the highest carbon emissions intensity in the Greenprint portfolio. Similar to 2019, retail-warehouse and industrial-self-storage reported the lowest carbon emissions intensity. Overall, median carbon intensities declined for most property types between 2019 and 2020. Industrial-manufacturing showed the greatest reduction in carbon intensity; however, this data is primarily scope 3 emissions from tenant use.

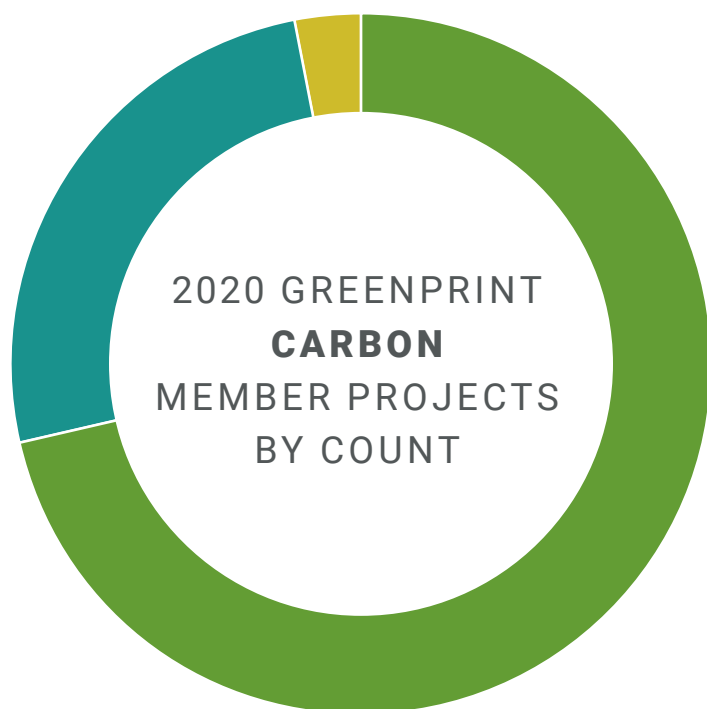
2020 CARBON EMISSIONS INTENSITY BY BUILDING TYPE (MT CO₂E/M²)



n=2020 property count ▲ Percent change from 2019 median to 2020 median ■ 25th percentile ■ 75th percentile *2019 median (for comparison)

On-Site Solar Remains a Priority Renewable Energy Investment

Greenprint members reported a total of 70 carbon-related ESG projects in 2020 with 50 focused on solar, 18 on transportation, and two focused on other emissions reduction strategies.



COUNT	TYPE	INVESTMENT
50	On-site renewable energy	\$18,060,806
18	Transportation	\$27,602
2	Miscellaneous emissions reduction	—

Note: Not all Greenprint-reported projects included data on cost; thus the project-related cost numbers in this report under-represent total investments.

THANK YOU TO GREENPRINT'S DATA PARTNERS



ULI is an Energy Star partner and proud recipient of a 2021 Partner of the Year award. 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.



In 2020, Greenprint added Goby as a data partner to improve the data reporting experience of Greenprint members who use that ESG platform. Goby helps portfolios develop and implement ESG initiatives that provide an imperative to attract and retain capital, accelerate sustainable and responsible growth, and mitigate enterprise risk.

Energy

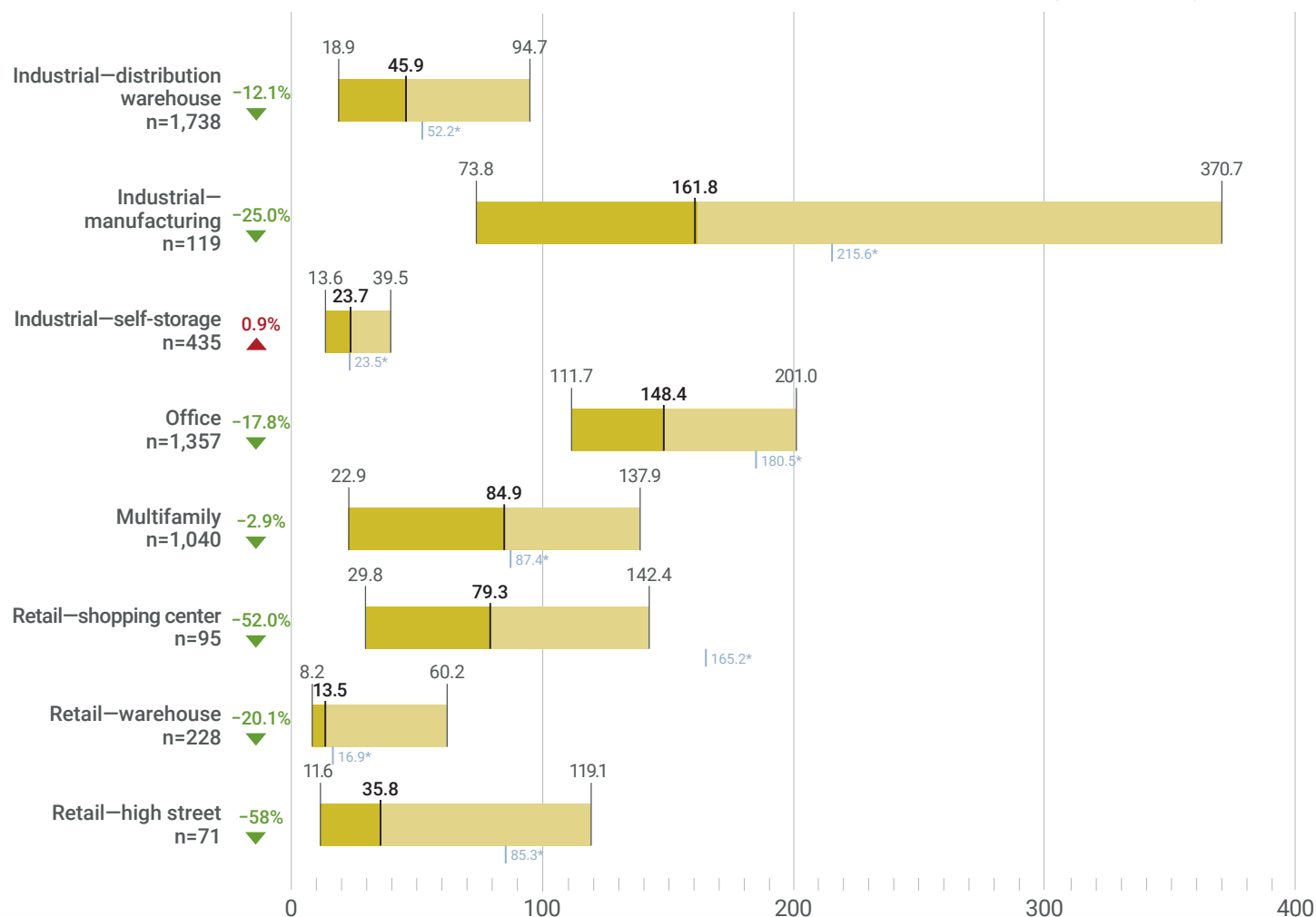
Reducing energy use by improving efficiency is central to reducing carbon emissions and can be achieved through any number of building improvements, whether to building envelopes, HVAC systems, or lighting and appliances, as well as through design and development of high-efficiency assets.

Energy efficiency investments have the added benefit that they almost always have a return on investment—reducing long-term operating expenses and improving a property’s net present value.

Energy Performance by Building Type

Benchmarking energy performance helps building owners estimate their progress over time, better understand their performance versus other buildings in the market, and calculate the potential energy and cost savings from improving performance. In 2020, industrial—manufacturing and office properties had the highest median energy use per square meter, while retail—warehouse and industrial—self-storage used the least energy per square meter. From 2019 to 2020, industrial—manufacturing, office, and retail properties saw the largest decreases in energy use intensity (EUI), likely due in large part to COVID-19 pandemic shutdowns limiting building occupancy by building tenants, customers, and guests.

2020 ANNUAL ENERGY USE INTENSITY BY BUILDING TYPE (KWH/M²)



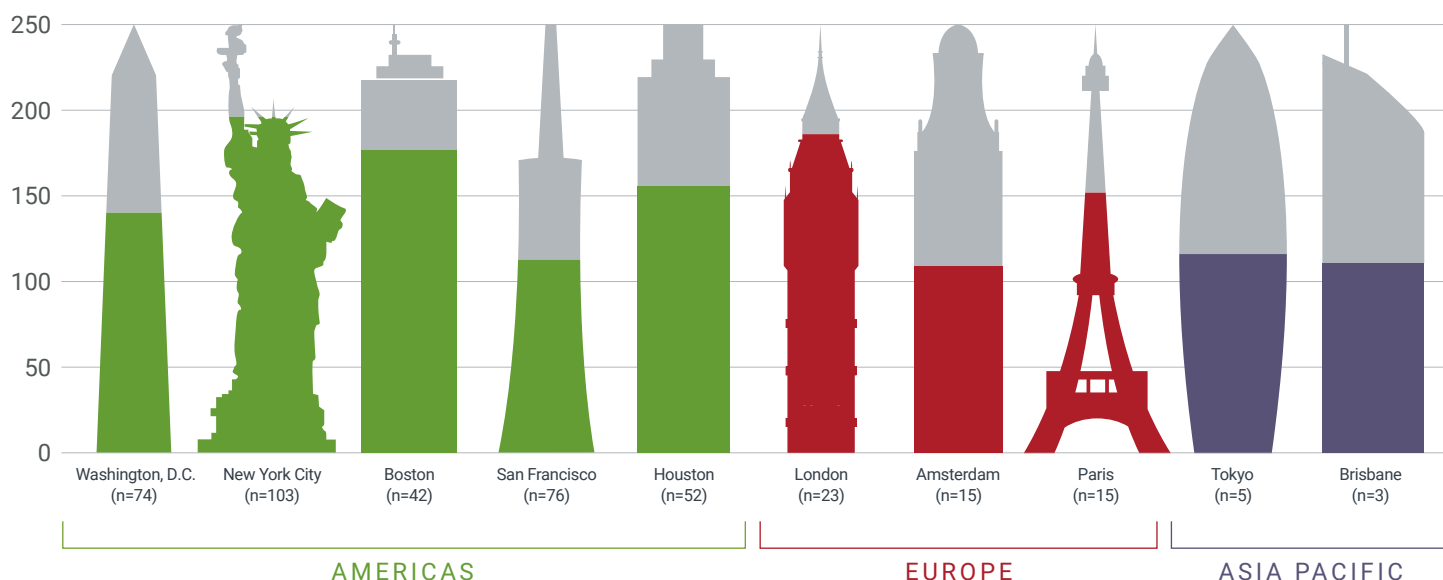
n=2020 property count ▲ Percent change from 2019 median to 2020 median ■ 25th percentile ■ 75th percentile *2019 median (for comparison)

Office Energy Performance in Select Cities

Cities and national governments continue to advance new policies and programs to decrease the environmental impacts of buildings. Even throughout 2020, new city climate action plans and regulations affecting building energy performance were passed across the globe, including a [building energy performance standard](#) in St. Louis, Missouri; a [push for timber construction](#) in France; and a [new set of national targets](#) for accelerating greener buildings in Singapore.

In 2020, office building EUI in a select group of cities decreased by 17 to over 26 percent from 2019. As cities mandated stay-at-home orders during the COVID-19 pandemic, office buildings faced very low occupancy, creating an opportunity to optimize building operations and cut utility costs during unprecedented economic conditions. Unfortunately, 2020 energy reductions did not parallel temporary occupancy levels. For example, New York City saw office occupancy drop more than 95 percent compared with pre-pandemic levels during April 2020, while Greenprint office properties there decreased total EUI by only 17.8 percent.

MEDIAN OFFICE ENERGY USE INTENSITY BY CITY (KWH/M²)

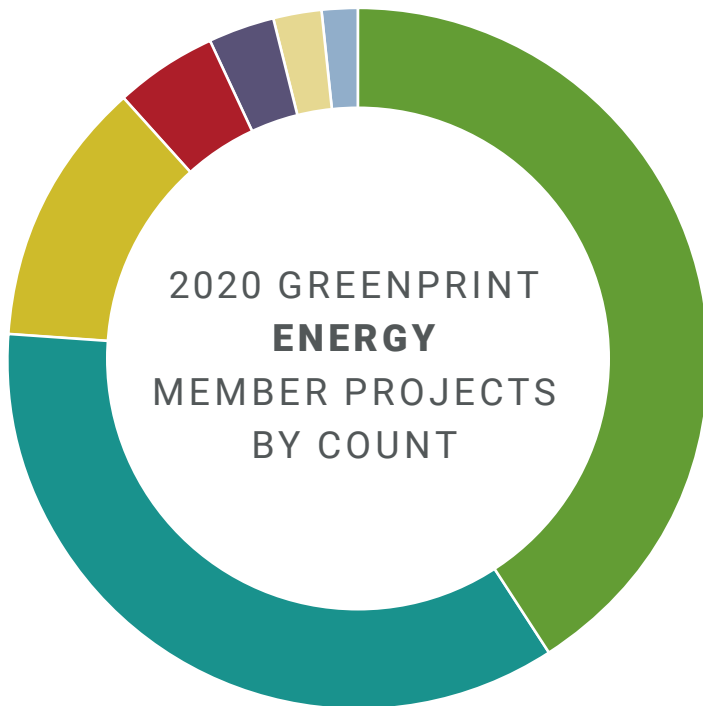


ELECTRIFY: THE MOVEMENT TO ALL-ELECTRIC REAL ESTATE

Building electrification is proving to be an important consideration for real estate leaders, both in new developments and in retrofits of existing buildings. While electrification has the potential to increase energy consumption in the short term, in the long term it enables a fully renewable-powered building. ULI published [Electrify: The Movement to All-Electric Real Estate](#) to show how the commercial real estate industry can shift toward a decarbonized future by moving to all-electric buildings and why real estate firms should be ahead of the curve.

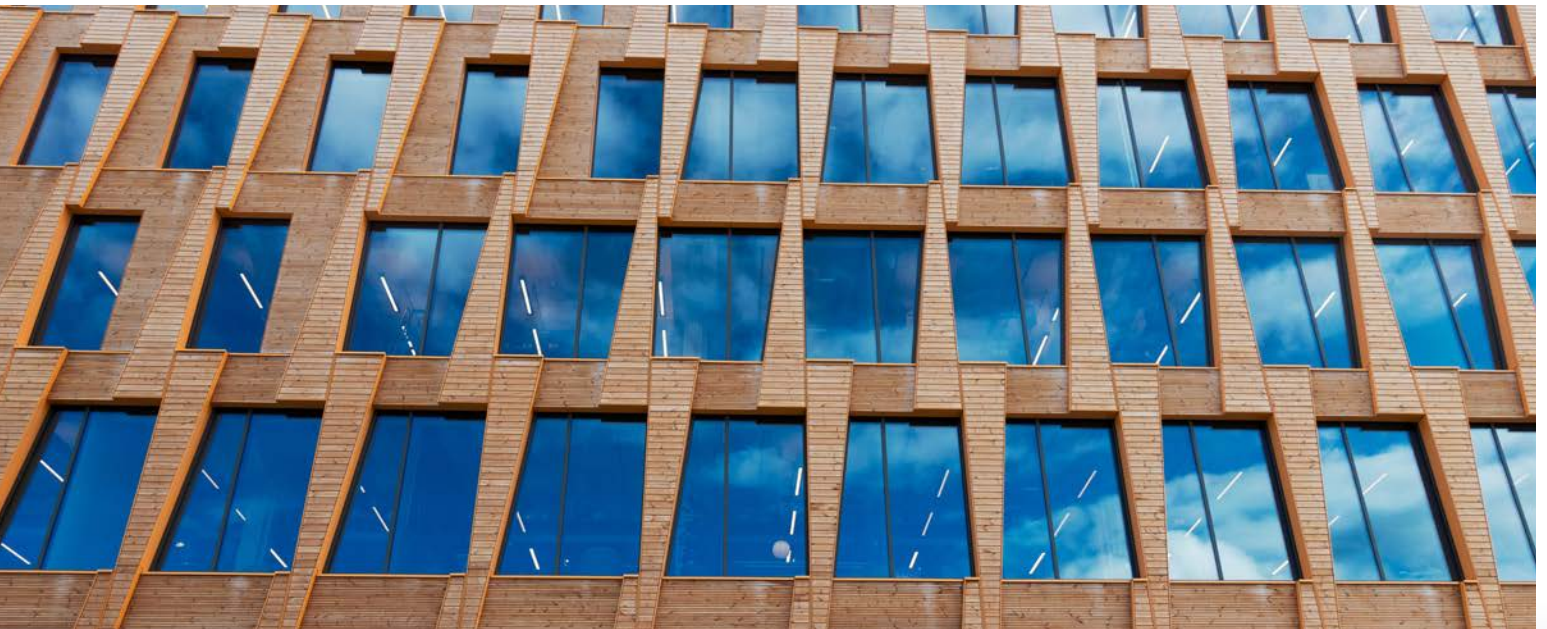
Lighting and Building Envelope Projects Achieve Efficiency Goals

While energy efficient lighting projects continue to hold strong as the top category of Greenprint 2020 energy-related projects, building envelope initiatives followed very close behind. Most notable in 2020 was the absence of energy metering projects. With many offices remaining closed or empty for the majority of the 2020 calendar year, data showed Greenprint members turning toward improvements such as efficient lighting and building envelope upgrades. In addition, tenant engagement and behavior-related projects saw a staggering 684 percent increase from 2019 totals; just 37 projects in 2019 increased to 290 in 2020.



COUNT	TYPE	INVESTMENT
5,168	High-efficiency equipment—lighting	\$10,596,820
4,447	Building envelope	\$12,415,155
1,544	BAS/BMS controls	\$9,466,875
615	High-efficiency equipment—HVAC, appliances	\$28,637,728
379	Technology/smart building upgrades	\$383,611
290	Behavior change/tenant engagement	\$84,115
186	Commissioning/retro-commissioning	\$3,263,969

Note: Not all Greenprint-reported projects included data on cost; thus the project-related cost numbers in this report under-represent total investments.



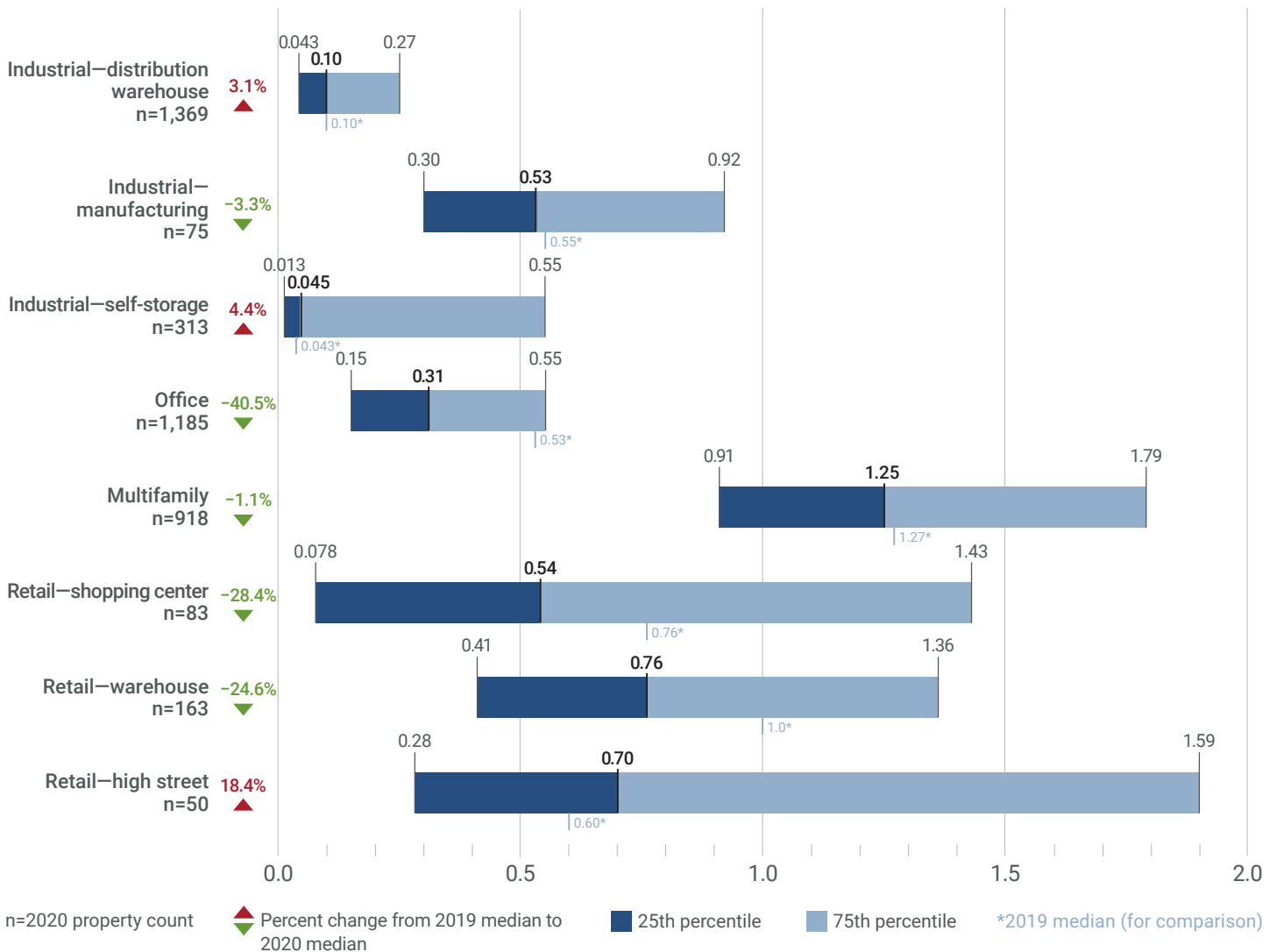
Water

Water conservation is an important sustainability priority in its own right, and reducing water demand at the asset level helps reduce utility costs and ensure a consistent water supply for buildings and ecosystems. As new regions reckon with the impacts of drought caused by a changing climate, attention to this aspect of asset management is growing.

Water Performance by Building Type

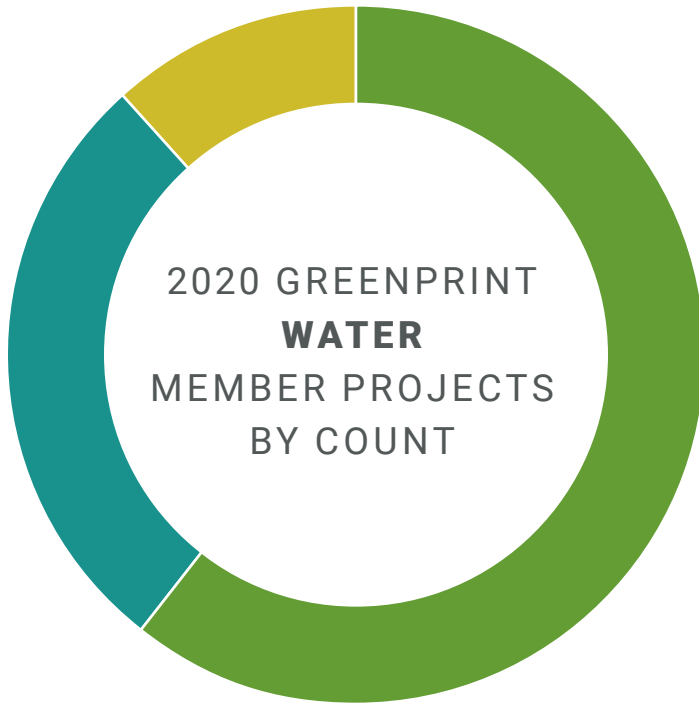
Once again, multifamily properties reported the highest water use per square meter, while industrial distribution warehouses and self-storage properties reported the lowest. Similar to energy performance, many property types showed a decrease from 2019 in overall water use intensity, notably office and retail shopping centers.

2020 WATER USE INTENSITY BY BUILDING TYPE (KL/M²)



High-Efficiency Equipment and Appliances a Priority in Water Projects

Greenprint members implementing water projects in 2020 largely focused on high-efficiency equipment and appliances across 507 projects.



COUNT	TYPE	INVESTMENT
507	High-efficiency equipment/appliances	\$2,595,345
231	Outdoor water efficiency and landscaping	\$673,753
96	Technology and innovation (i.e., stormwater reuse, leak detection, wastewater treatment)	\$107,942

Note: Not all Greenprint-reported projects included data on cost; thus the project-related cost numbers in this report under-represent total investments.



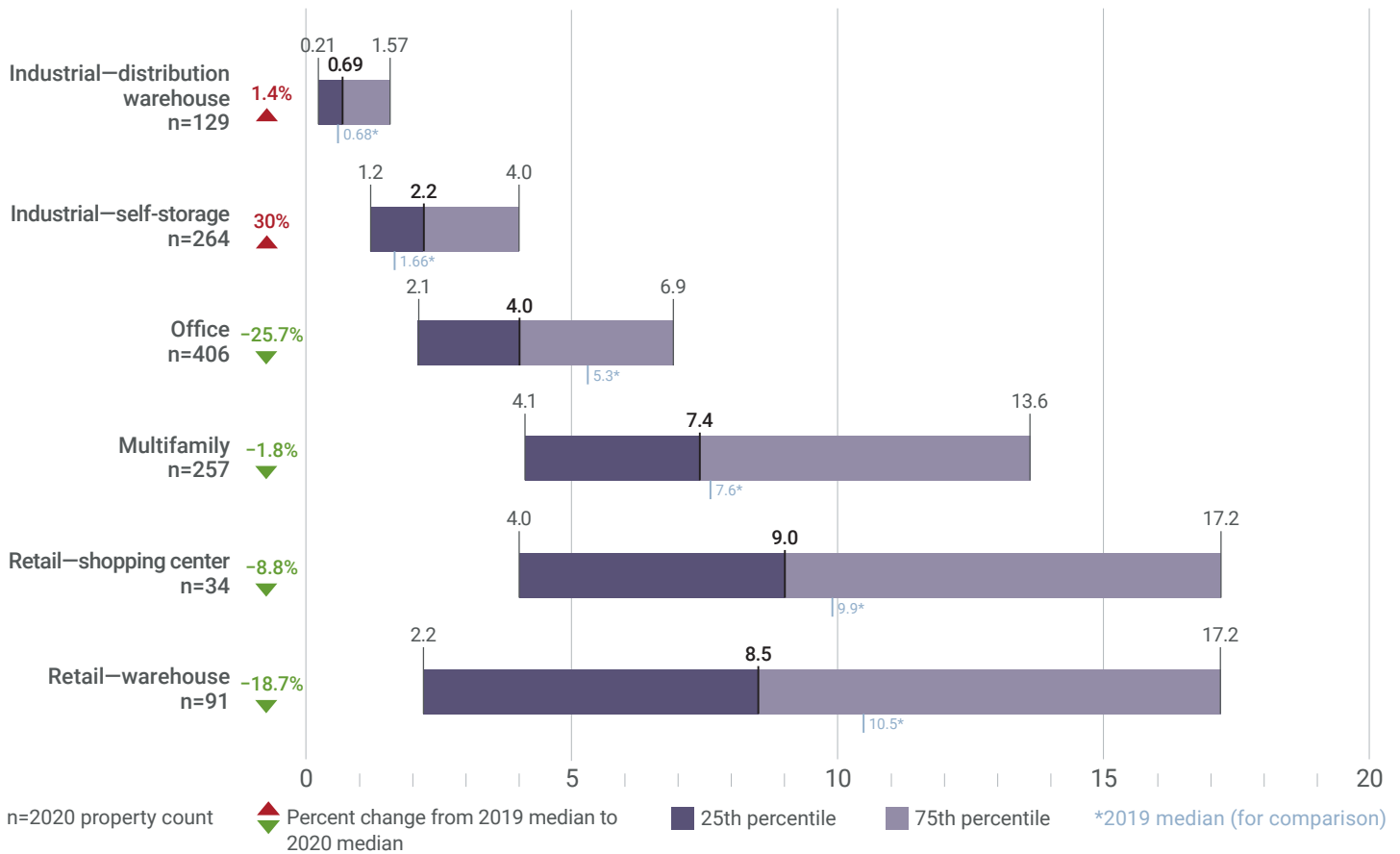
Waste

Reducing waste decreases the cost of waste management and the indirect carbon emissions from landfills; for building materials, it can provide important value-add opportunities to new construction or renovation through material reuse or repurposing.

Waste Performance by Building Type

Similar to 2019, retail properties in 2020 reported the most waste per square meter, and distribution warehouse facilities reported the lowest waste intensity. Office properties decreased waste use intensity the most from 2019 to 2020, possibly because of lower overall occupancy or disruption of waste removal services.

2020 WASTE INTENSITY BY BUILDING TYPE (KG/M²)



Recycling and Waste Management Drive Waste Reductions

Recycling and waste management reigned as the vast majority of Greenprint members' waste projects in 2020. One notable increase from 2019 is composting: members completed 96 composting projects in 2020 versus only 35 in 2019. Across the industry, waste continues to be an important area to address but one that proves complex and complicated in many instances. Tenant engagement on waste initiatives continues to prove a challenging area for many companies.



COUNT	TYPE	INVESTMENT
682	Recycling program	\$2,304
456	Waste management	\$12,202
96	Composting (landscape and food waste)	\$226
26	Waste monitoring, audits, and tenant engagement	—

Note: Not all Greenprint-reported projects included data on cost; thus the project-related cost numbers in this report under-represent total investments.



Guide to Report Terms and Charts

Report Terms

CARBON INTENSITY

Annual carbon emissions divided by gross floor area, including CDP (formerly the Carbon Disclosure Project) scope 1 and 2 emissions at minimum and scope 3 emissions if member companies choose to do so.

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.

MEDIAN

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

NET ZERO

ULI Greenprint follows the World Green Building Council definition of net zero, which is a building portfolio that is highly efficient and fully powered by on-site and off-site renewable energy sources and offsets.

RENEWABLE ENERGY CREDIT

A renewable energy certificate (REC) is a market tool that represents the property rights to the environmental, social, and other nonpower attributes of renewable electricity generation. RECs are issued when one megawatt-hour of electricity is generated and delivered to the electricity grid from a renewable energy resource.

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. The analysis does not normalize for changes in building performance due to COVID.



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