6

Greenprint Performance Report™

VOLUME 6

ULI Greenprint Center
for Building Performance

Greenprint Members

AETOS CAPITAL REAL ESTATE

architecture 2030

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About ULI

The mission of the Urban Land Institute is to provide leadership in the responsible use of land and in creating and sustaining thriving communities worldwide.

Established in 1936, the Institute today has more than 35,000 members worldwide, representing the entire spectrum of the land use and development disciplines. ULI relies heavily on the experience of its members. It is through member involvement and information resources that ULI has been able to set standards of excellence in development practice. The Institute has long been recognized as one of the world's most respected and widely quoted sources of objective information on urban planning, growth, and development.

About ULI Greenprint Center

The ULI Greenprint Center 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 education, Greenprint and its members strive to reduce greenhouse gas emissions by 50 percent by 2030, in line with the goals of the Intergovernmental Panel on Climate Change.[1]

Greenprint is a catalyst for change, helping members take meaningful and measurable actions to advance environmental performance. In order to meet its objectives, Greenprint is bringing to light sustainability best practices and helping lead the real estate industry toward harmonized global standards for environmental performance metrics and benchmarking. Our members collectively use the Greenprint Environmental Management Platform to track, report, benchmark, and analyze energy, emissions, water, and waste performance for properties, funds, and portfolios. The platform supports comprehensive data management and analysis, which enables members to take actions toward improving environmental performance and reducing emissions. We endeavor to demonstrate the correlation between environmental performance and enhanced property value.

Each year, Greenprint publishes a consolidated view of the portfolio of participating properties, highlighting environmental performance by geography and property type in the Greenprint Performance Report™. Members also receive reports detailing individual property, fund, and portfolio performance against appropriate benchmarks, which allow them to better manage their portfolios and demonstrate environmental progress.

Patrick L. Phillips
Global Chief Executive Officer, ULI
President, ULI Foundation

Letter to Greenprint Stakeholders

We are pleased to report that for the sixth year in a row, Greenprint members have lowered their energy consumption and emissions!

Greenprint members—many of the world's leading real estate owners—have come together to voluntarily track, benchmark, and improve the environmental performance of their properties globally. They have demonstrated great leadership in their commitment and actions and have shown how improving building performance can reduce operating costs, enhance property value, reduce pollution, and save natural resources.

Volume 6 of the Greenprint Performance Report™ continues to be the largest global collection of transparent, verifiable, and comprehensive property data that provides aggregate benchmarks and performance trends for the real estate industry. This report includes data from 5,224 properties across 112 million square meters (1.2 billion square feet) of building area in 51 countries. On a like-for-like basis, energy consumption decreased 3.3 percent and greenhouse gas emissions decreased 2.7 percent. A significant achievement for the sixth year in a row!

As an organization with a diverse range of global stakeholders, the ULI Greenprint Center for Building Performance strives to understand and report on risks and opportunities that are driving the real estate industry toward more responsible property management and operations. In this year's report, we provide case studies documenting best practices in energy management, water conservation, and waste management, as well as a new section on biodiversity. In addition to releasing this report, Greenprint hosts a quarterly ULI-wide webinar series that promotes the innovative ideas, research, and best practices that our members and partners are using to lead the real estate industry toward improved performance.

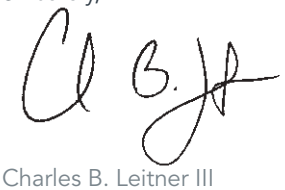
Greenprint and its partner organizations work together to elevate strategic sustainability issues and create lasting changes. This year we continued to strengthen our relationships with the Natural Resources Defense Council and the Better Buildings Partnership. We also collaborated with the Institute for Market Transformation, C40, and the German Property Federation (ZIA) to discuss metrics that can be used to standardize global environmental performance in the property industry for both voluntary and mandatory benchmarking.

In support of mandatory policy governing city-level building energy performance, Greenprint developed a partnership with the San Francisco Department of the Environment to create a city-specific energy benchmarking and audit report. We believe that Greenprint can play a vital role in aggregating, analyzing, and helping cities report results in a consistent and compelling manner. It is through relationships like these that we are able to establish stronger city-specific benchmarks and examine metrics and attributes that define high performance within a city or region.

Responsible investment, ownership, and management strategies are as much about operating healthier, more livable, and more productive properties as about improving environmental performance. In an effort to help our members and the industry generate lasting asset value, we are also working across ULI to better integrate our work with various programs such as Capital Markets, Building Healthy Places, and the Urban Resilience Program. By providing broad programming, Greenprint will continue to be a leader and resource for building owners and investors.

We would like to acknowledge the outstanding leadership of our members, partners, and collaborators. Thank you for your contributions and inspiration. We look forward to working with you in the years ahead.

Sincerely,



Charles B. Leitner III
Chairman, ULI Greenprint Center

Helen A. Gurfel
Executive Director, ULI Greenprint Center

Contents

Greenprint Performance Report Guide

The Greenprint Performance Report™, Volume 6, is based on 5,224 property submissions representing 112 million square meters (1.2 billion ft²) across 51 countries. The Greenprint portfolio consists of five main property types: office, retail, industrial, multifamily, and hotel.

Greenprint sets the standard for a common system to measure and benchmark energy consumption, emissions, water use, and waste across the global real estate industry. The Greenprint Environmental Management Platform ensures continued alignment with the growing number of global disclosure programs. The Greenprint database is created from records of individual properties and is transparent in terms of property characteristics used and calculations applied. The report provides not only current-year benchmarks, but also a comparison of data from one year to the next for the same set of properties—"like for like" comparisons.

The **EXECUTIVE SUMMARY** provides a snapshot of the Greenprint portfolio's growth and performance from 2013 through 2014.[2]

- Environmental performance is summarized for the 2013-2014 like-for-like portfolio that includes 3,446 properties.
- The properties and floor area included in the portfolio is captured by showcasing the property distribution across property types and global regions.

The **SETTING THE STAGE** section provides the background data, facts, and figures on the key metrics that are driving climate change and the associated environmental indicators, such as higher global temperature, rising sea levels, and extreme weather events.

The **ANNUAL RESULTS** section highlights current-year absolute benchmarks and like-for-like performance for energy consumption, emissions, water use, and waste disposal.

Each year, Greenprint tracks the environmental performance of thousands of properties, many of which greatly improve their environmental performance year over year. This year, some insights on how real estate companies are taking steps toward better performance are provided. Throughout the report you will find case studies highlighting successful performance-improvement strategies, ranging from property-specific no-/low-cost operational improvements to more comprehensive portfolio-wide approaches. Property owners and operators are motivated to improve performance for many reasons: to reduce expenses/increase income, to comply with regulations, to drive tenant satisfaction and retention, to conserve natural resources, and to reflect their organization's sustainability values.

- The **ENERGY** section provides data on like-for-like performance on a global scale, as well as energy use intensity (EUI), by property type, region, country, and city. Data are normalized by building area, full-time equivalents, and core operating hours. Greenprint uses site energy rather than source energy for all reported energy metrics. This is a conscious decision so that energy reductions at the site level can be isolated and global methodologies for analysis can remain consistent. Site energy is translated into source emissions in order to take into account the variations in energy mix used across the numerous local and national electricity grids.
- The **GREENHOUSE GAS (GHG) EMISSIONS** section details current-year emissions, provides like-for-like comparisons, and displays various emission equivalencies.
- The **WATER** section contains like-for-like analysis and water intensity normalized for floor area, full-time equivalents, multifamily units, and hotel rooms.
- The **WASTE** section details waste metrics throughout the Greenprint portfolio and includes a breakdown of waste reported by diversion method and property type.

The **BIODIVERSITY** section provides background information on urban biodiversity and highlights several case studies that exemplify how real estate owners are attempting to maintain local and global ecosystems.

LONG-TERM PERFORMANCE captures Greenprint's Historical Performance and the Greenprint Carbon Index.

- The **HISTORICAL PERFORMANCE** section summarizes Greenprint's growth and performance since inception.
- The **GREENPRINT CARBON INDEX** (GCX) is the normalized emissions intensity (kg CO_2e/m^2) of Greenprint members' properties, for each year since inception.

The **APPENDIXES** contain Quality Control and Verification processes in line with ISO 14064, Glossary, Property Subtype Definitions, and Emission Coefficients.

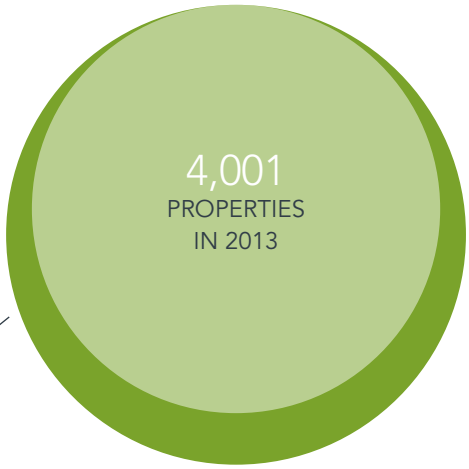
As a global organization, Greenprint has decided to present this report mainly in the International System of Units (SI) and euro currency. Where appropriate, imperial units are included. Individual member reports are customized to provide local metrics and currency.

1 EXECUTIVE SUMMARY

Greenprint at a Glance

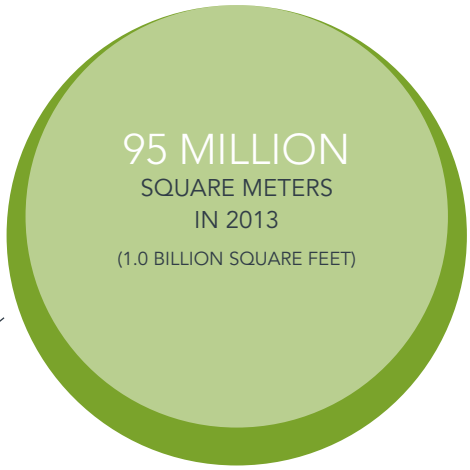
YEAR OVER YEAR

Increased interest in sustainability across the real estate industry has led to a year of growth and stronger engagement from members and partners.



5,224 PROPERTIES IN **2014**

31% increase in properties



112 MILLION SQUARE METERS IN **2014**
(1.2 BILLION SQUARE FEET)

18% increase in building area

214 PROPERTY FUNDS IN **2014**

14% increase in property funds

Greenprint Portfolio Facts

€

over €521B
(US $665B)
real estate assets under management by Greenprint members

1,250,982
number of employees working in Greenprint buildings

51
number of countries represented in the portfolio

Performance Snapshot

YEAR OVER YEAR—LIKE FOR LIKE

ENERGY CONSUMPTION

energy
-3.3%

2013: 12,246 million kWh
2014: 11,847 million kWh
3,446 properties

CO_2e EMISSIONS

carbon
-2.7%

2013: 4,460 thousand mt
2014: 4,340 thousand mt
3,446 properties

COST

cost of energy[3]
+1.2%

2013: €535.2 million ($683.6 million)
2014: €541.6 million ($691.7 million)
1,867 properties

ELECTRICITY

electricity
-2.0%

2013: 8,589 million kWh
2014: 8,417 million kWh
3,446 properties

WATER USE

water
-1.9%

2013: 55.6 million kiloliters
2014: 54.5 million kiloliters
2,383 properties

DENSITY

occupancy
+0.3%

2013: 93.3%
2014: 93.6%
3,190 properties

2014 Emission Reduction Equivalents[4]

277,856
BARRELS OF OIL NOT CONSUMED

25,153
CARS TAKEN OFF THE ROAD

10,901
HOMES NOT CONSUMING ENERGY

3,063,538
TREES PLANTED

58,211
METRIC TONNES OF COAL NOT BURNED

Distribution by Geography

YEAR OVER YEAR

The Greenprint portfolio spans the globe, with the largest number of assets located in the Americas. Property growth in EMEA and the Asia Pacific region is a priority for Greenprint. Greenprint members and partners have selected which assets to submit based on three criteria:

- Data availability
- Geographic distribution
- Managerial control

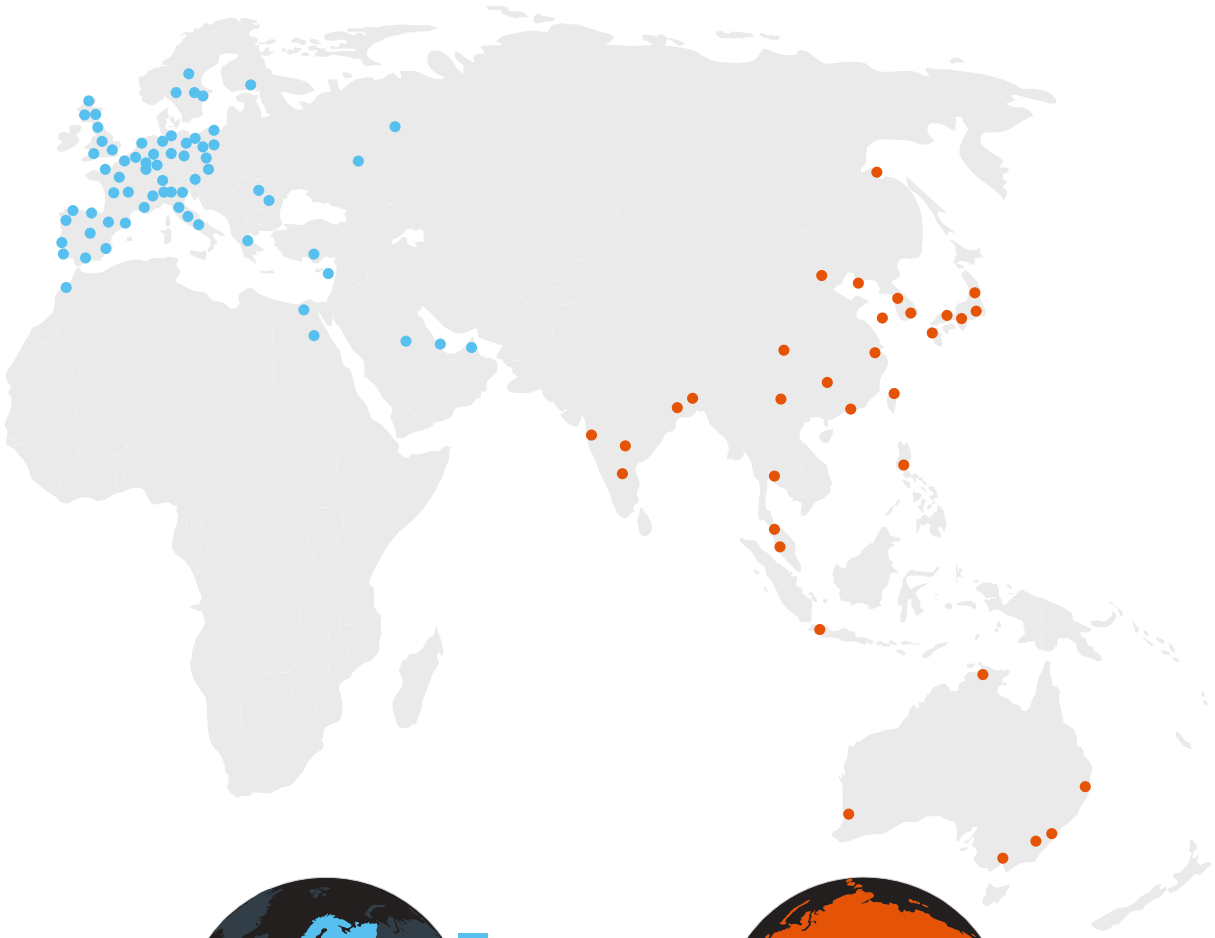
AMERICAS

3,368 assets, 9 countries
73.9 million m^2 (795 million ft^2)

47% increase in number of properties

Distribution by Geography

YEAR OVER YEAR



EMEA

1,664 assets, 28 countries
31.2 million m² (335.4 million ft²)

6% increase in number of properties

ASIA PACIFIC

192 assets, 13 countries
7.3 million m² (78.2 million ft²)

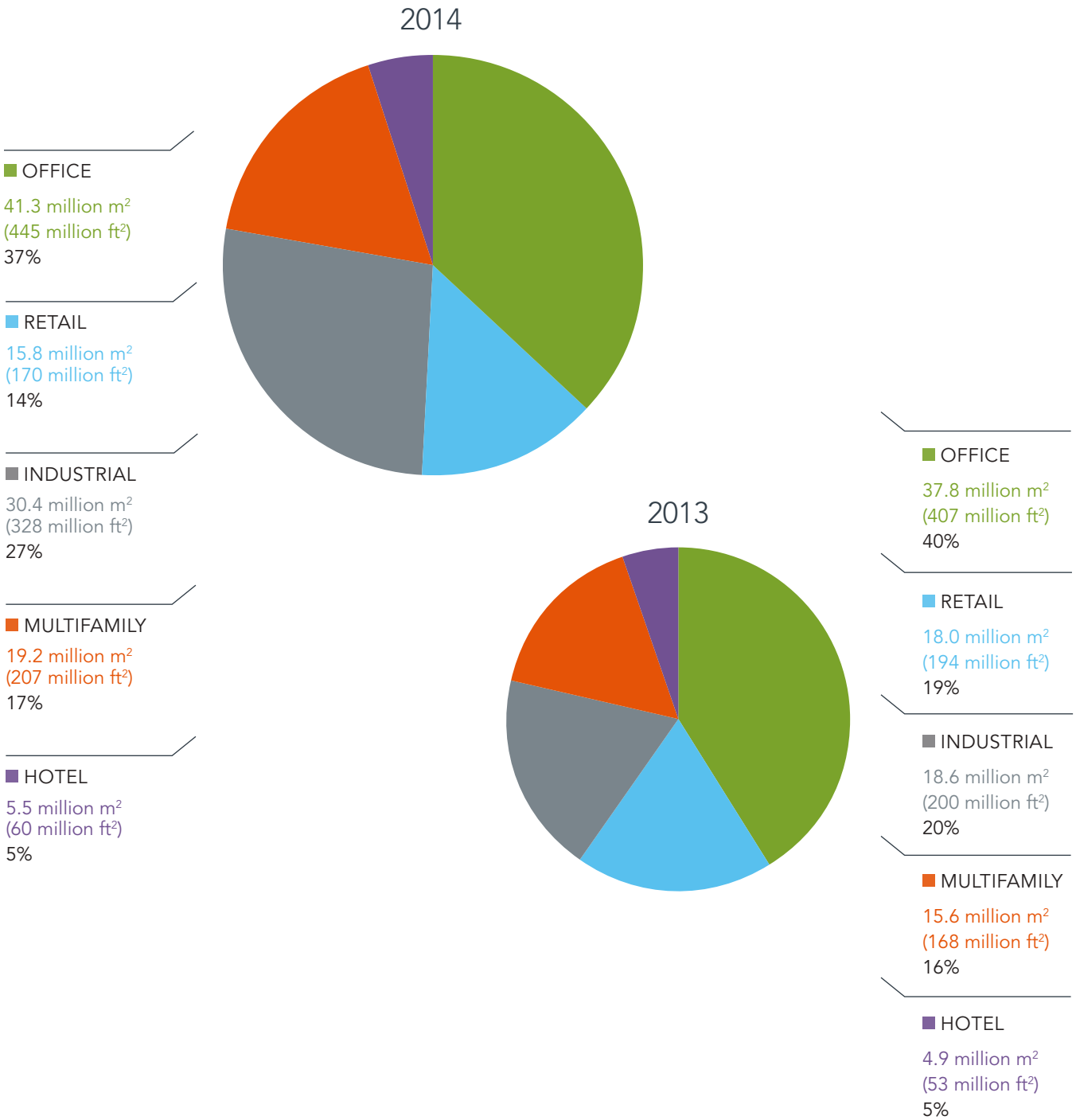
28% increase in number of properties

The global Greenprint portfolio increased 31% by number of properties and 18% by floor area.

Distribution by Property Type

YEAR OVER YEAR

The Greenprint Performance Report™ includes all major property types, featuring office, industrial, multifamily, retail, and hotel properties. To further analyze and explain property performance, each property type is divided into industry-recognized subtypes throughout the report.



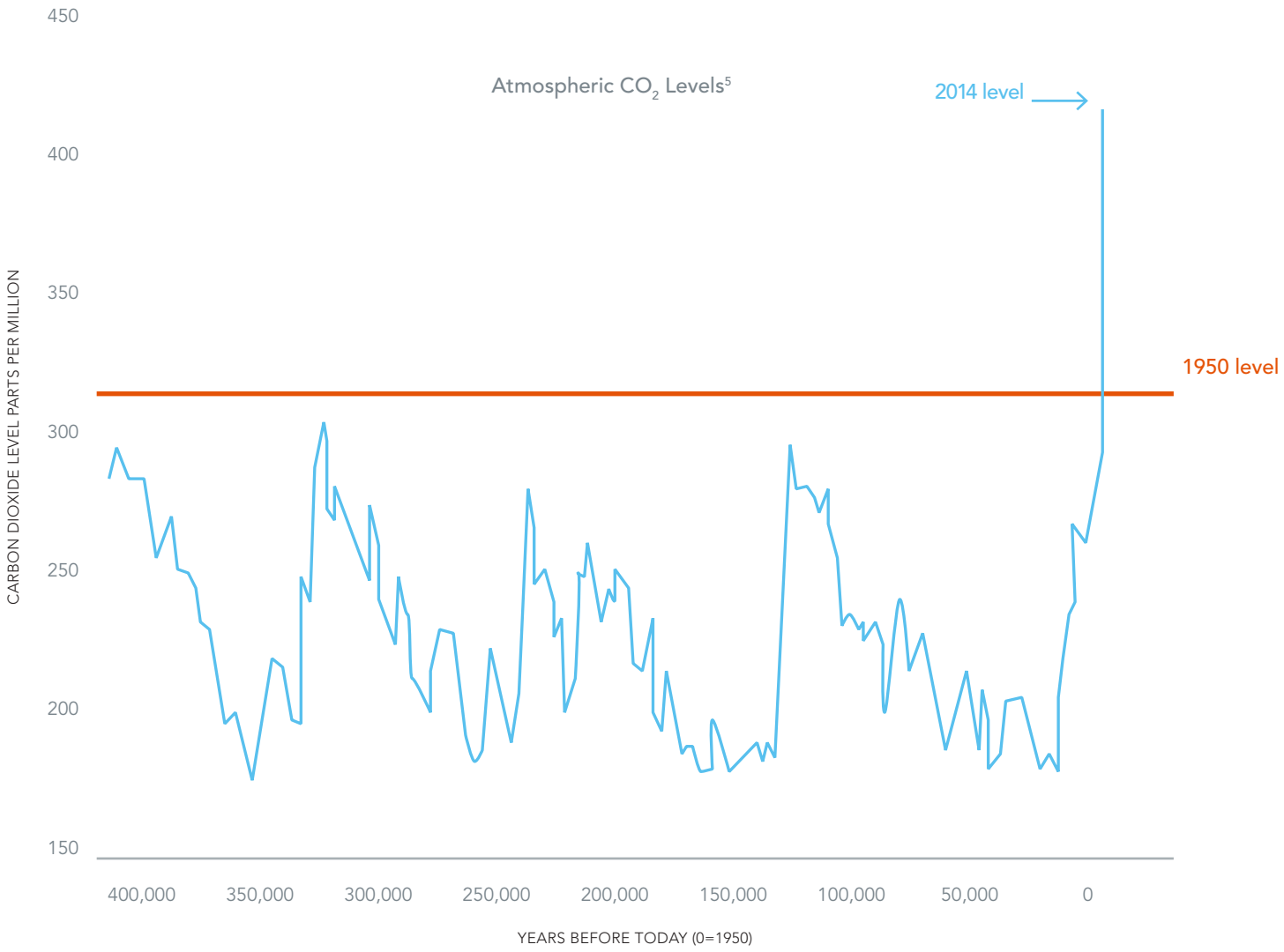
2 SETTING THE STAGE—CLIMATE CHANGE

Facts are Facts

The most commonly referenced indicators of climate change are atmospheric carbon dioxide levels, global temperature increases, and sea level rise. These indicators have increased significantly over the past several decades.

Atmospheric Carbon Dioxide Levels

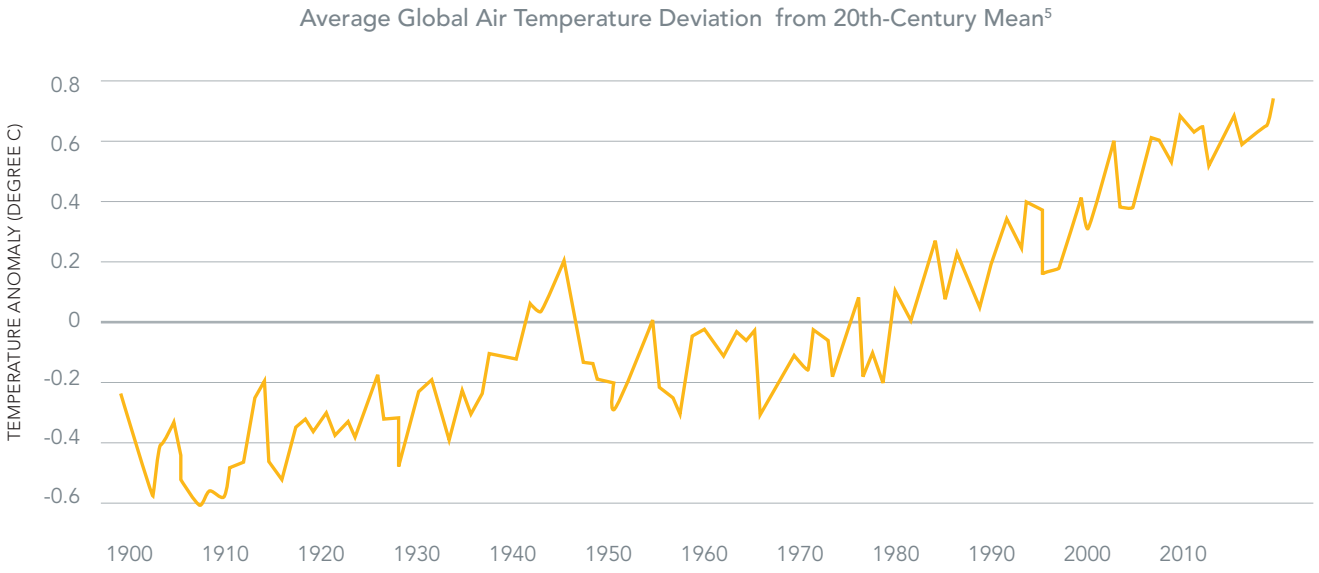
Carbon dioxide (CO_2) is a greenhouse gas that is released through various natural and human activities, including fossil fuel combustion, respiration, and volcanic eruptions.



Atmospheric carbon dioxide has never been above the red line in 650,000 years.[5]

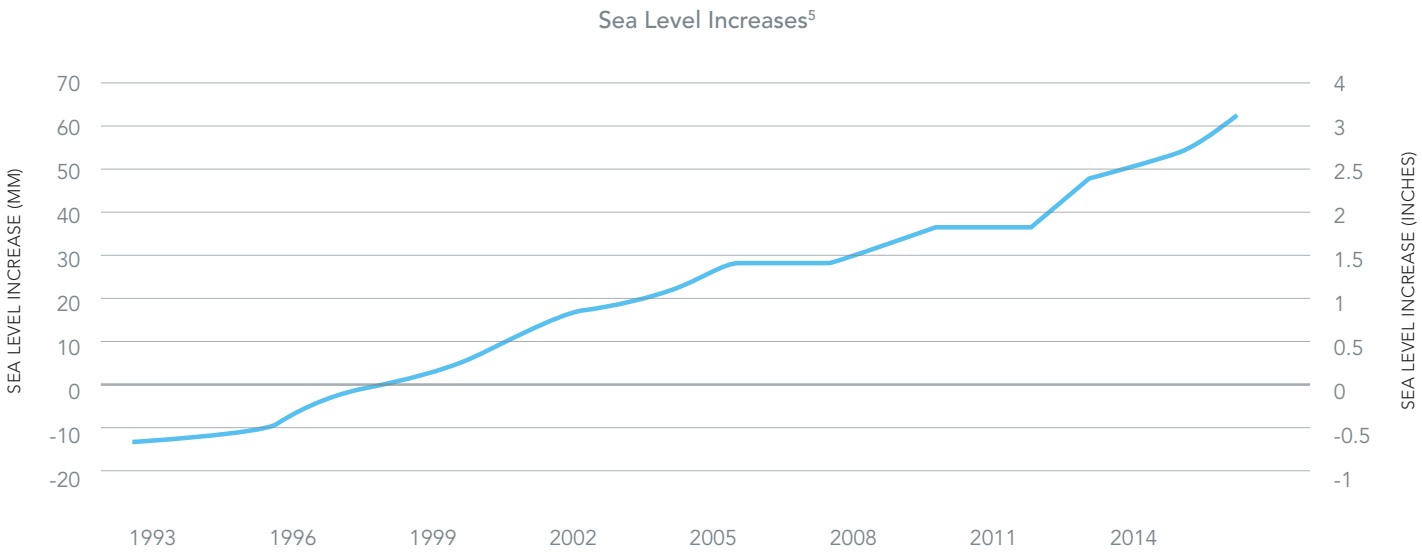
Global Surface Temperature

Global temperatures have been steadily rising over the past century, with the rate of temperature increase accelerating in recent decades. The year 2014 was the warmest year across global land and ocean surfaces since record keeping began in 1880.[6]



Sea Level

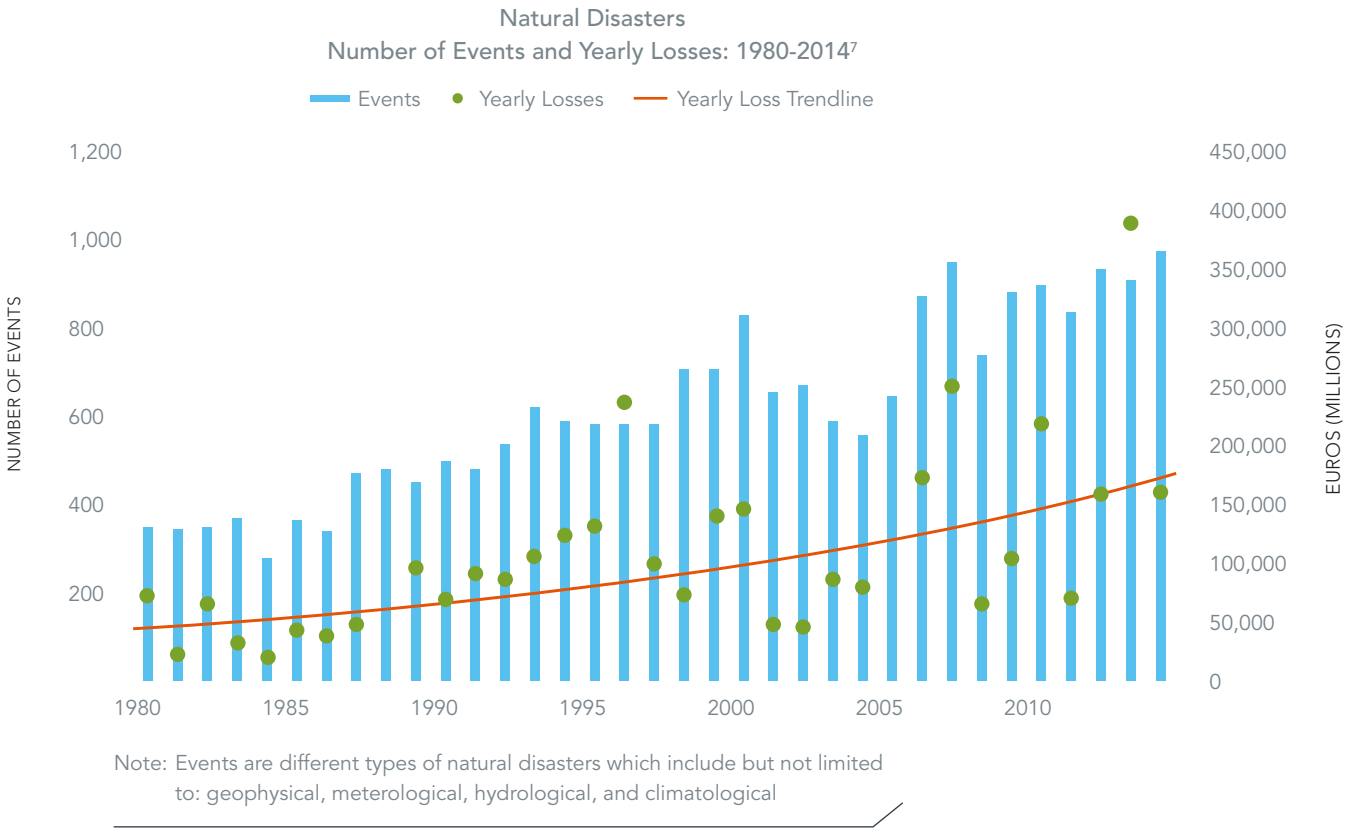
Sea-level rise is caused by two primary factors: the melting of land-based glaciers, which adds water to the oceans, and the expansion of ocean water as it warms. Sea level as observed by satellites over the past 20-plus years has risen by about 75 millimeters (2.95 inches), adversely affecting coastal cities, infrastructure, and the environment globally.[5] Using current sea-level rise projections, coastal cities and low-level islands are at risk of land-loss and salt water intrusion into freshwater aquifers.



Natural Disasters and Their Impact on Real Estate Value

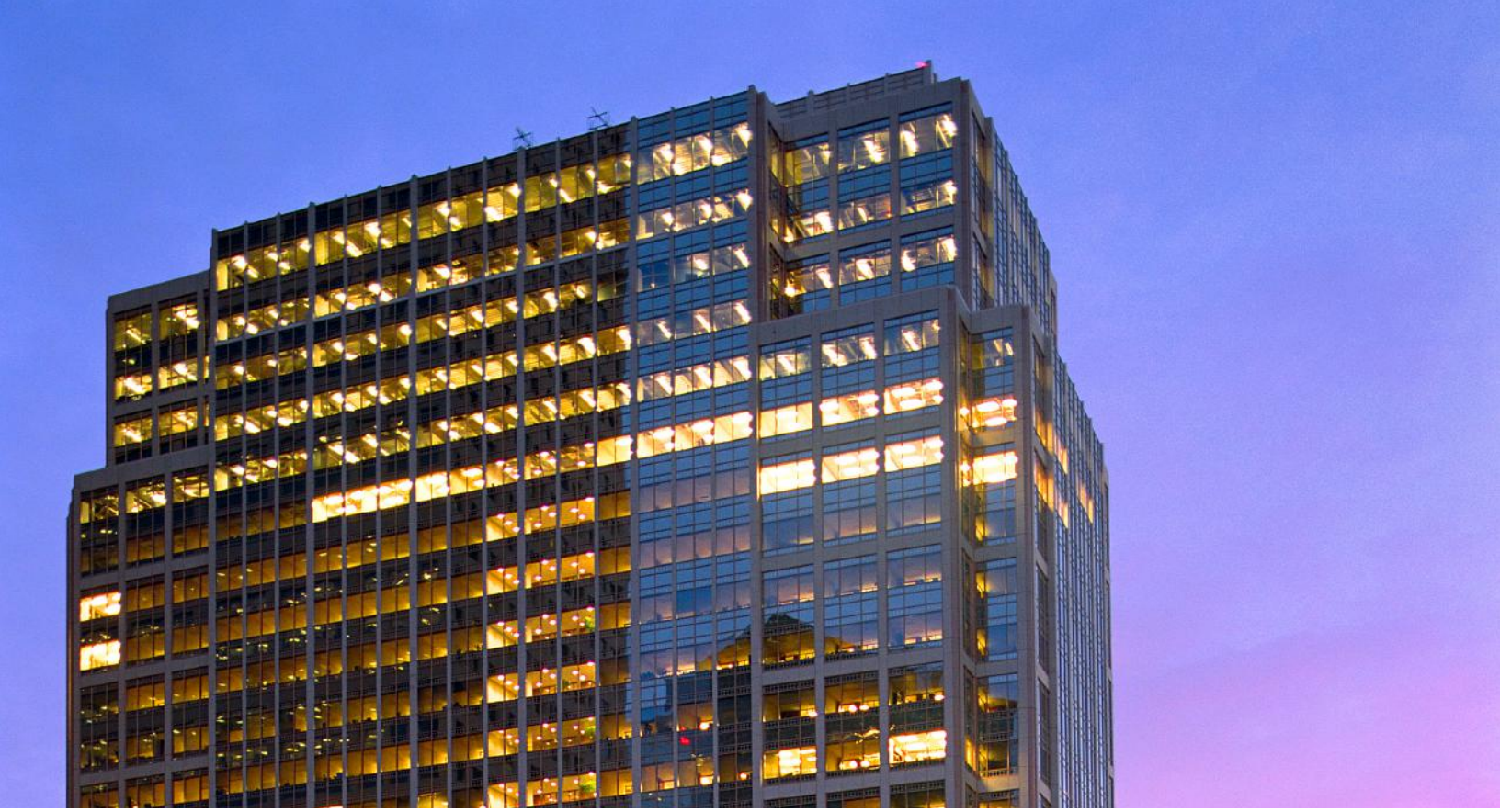
Scientists and institutions have linked the more frequent and intense occurrence of natural disasters to the trends associated with climate change. This increase in extreme weather events can have significant impacts on economic growth and asset value.

The chart below highlights the increasing frequency and costs associated with natural disasters since 1980.

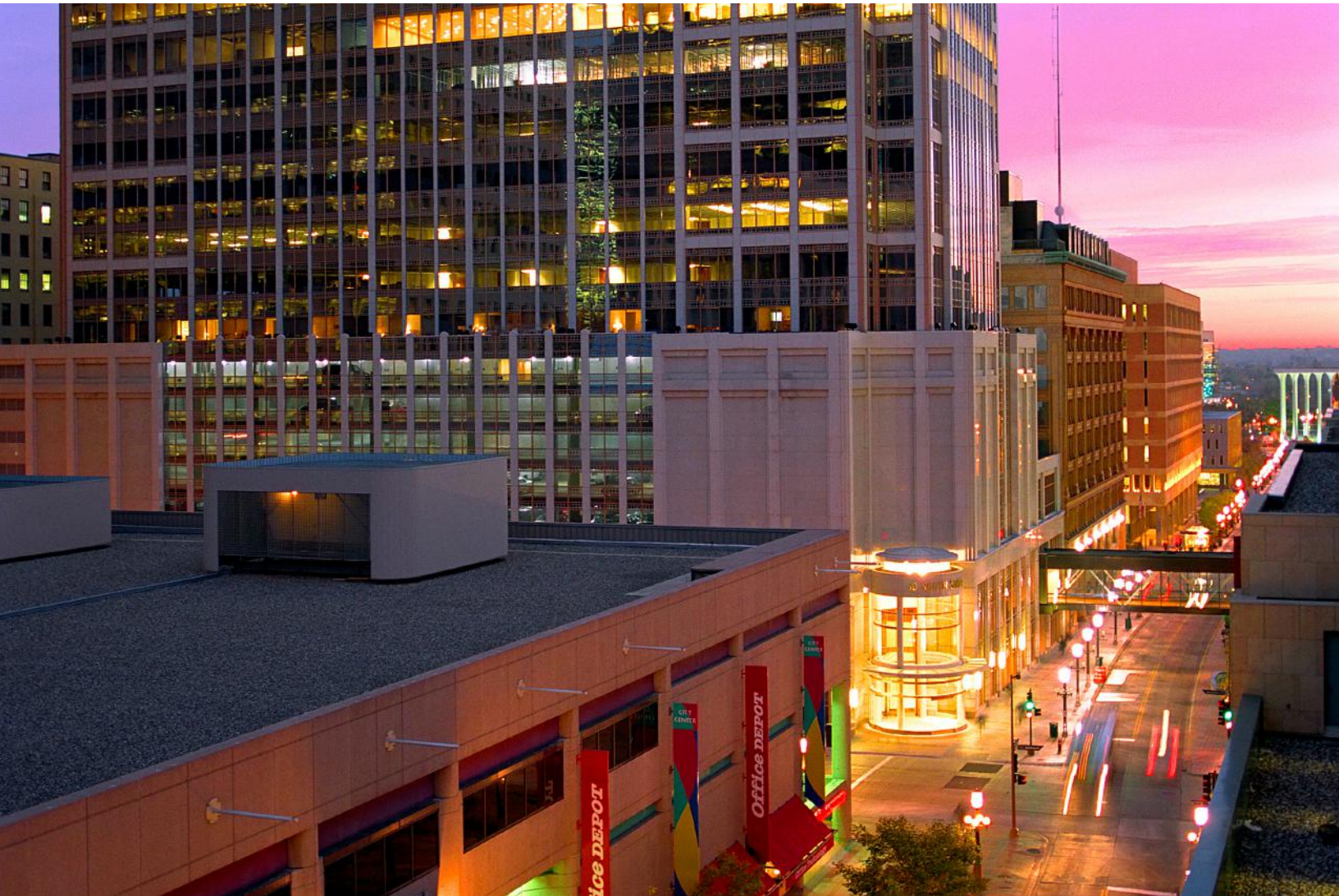


In the past several years, the world has experienced significant and costly natural disasters that affected many real estate markets, including New York City, Munich, Manila, São Paolo, California, eastern Europe, and others. It is likely this trend will continue if actions are not taken.

In addition to reducing the energy and emissions associated with their buildings, real estate owners need to understand the vulnerabilities of their properties and plan for ways in which to mitigate against future disasters that could harm their assets and infrastructure. ULI has created an Urban Resilience Program under the ULI Center for Sustainability to help the real estate industry address these challenges both at the individual-owner and city-planning levels.



3 ENERGY—ANNUAL RESULTS



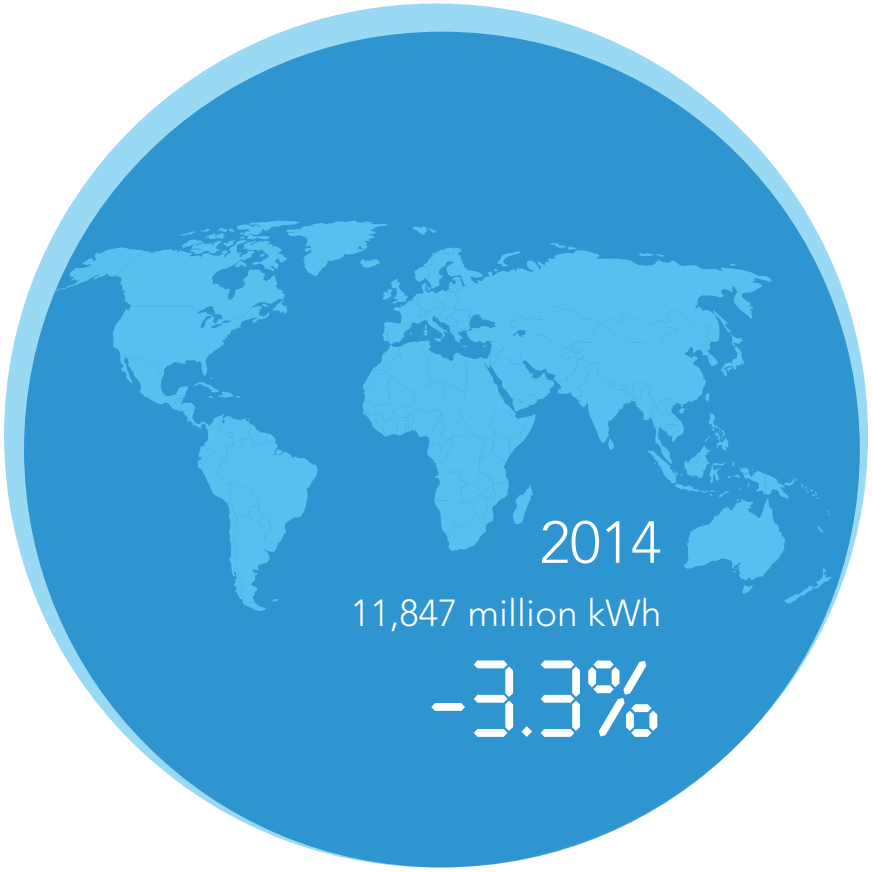
Energy Consumption

YEAR OVER YEAR—LIKE FOR LIKE

The chart below shows the like-for-like portfolio, which consists of 3,446 properties with 80.7 million square meters (869 million ft^2) of space, with data from 2013 through 2014.

2013

12,247 million kWh



The Greenprint portfolio's energy consumption decreased 3.3%, saving over 399 million kWh—nearly equivalent to one day of electricity consumption in the Philippines, Peru, Portugal, and Kenya combined.[8]

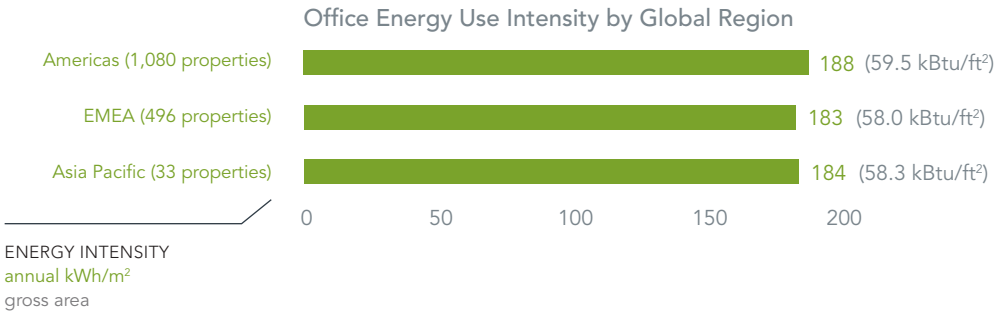
Energy Use Intensity of Office Properties

CURRENT

Energy use intensity is annual energy consumption divided by the floor area of the property. Building energy use intensity is affected by a variety of factors, including tenant energy data, worker density, and weather. As the Greenprint database grows and diversifies, the median energy intensities are expected to become increasingly representative of property subtypes in cities, countries, and regions.

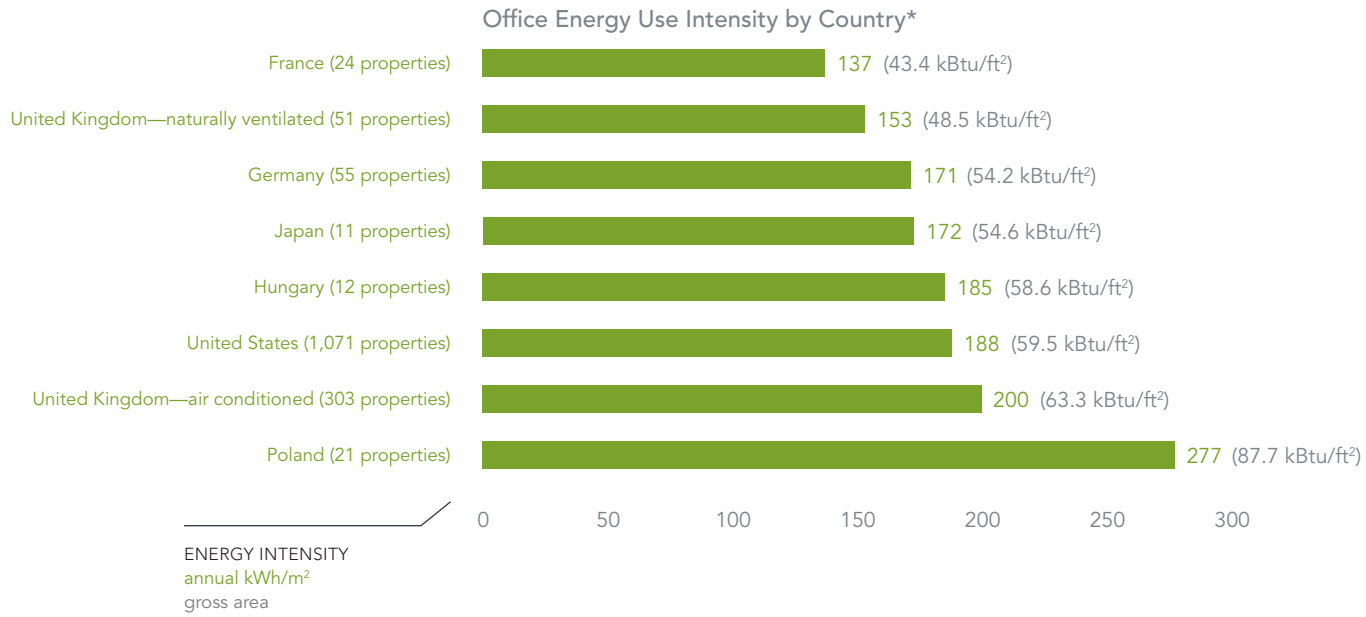
By Global Region

The chart below shows the median energy use intensity for Greenprint's portfolio of office buildings by global region.



By Country

The chart below shows the median energy use intensity for Greenprint's portfolio of office properties in seven countries.



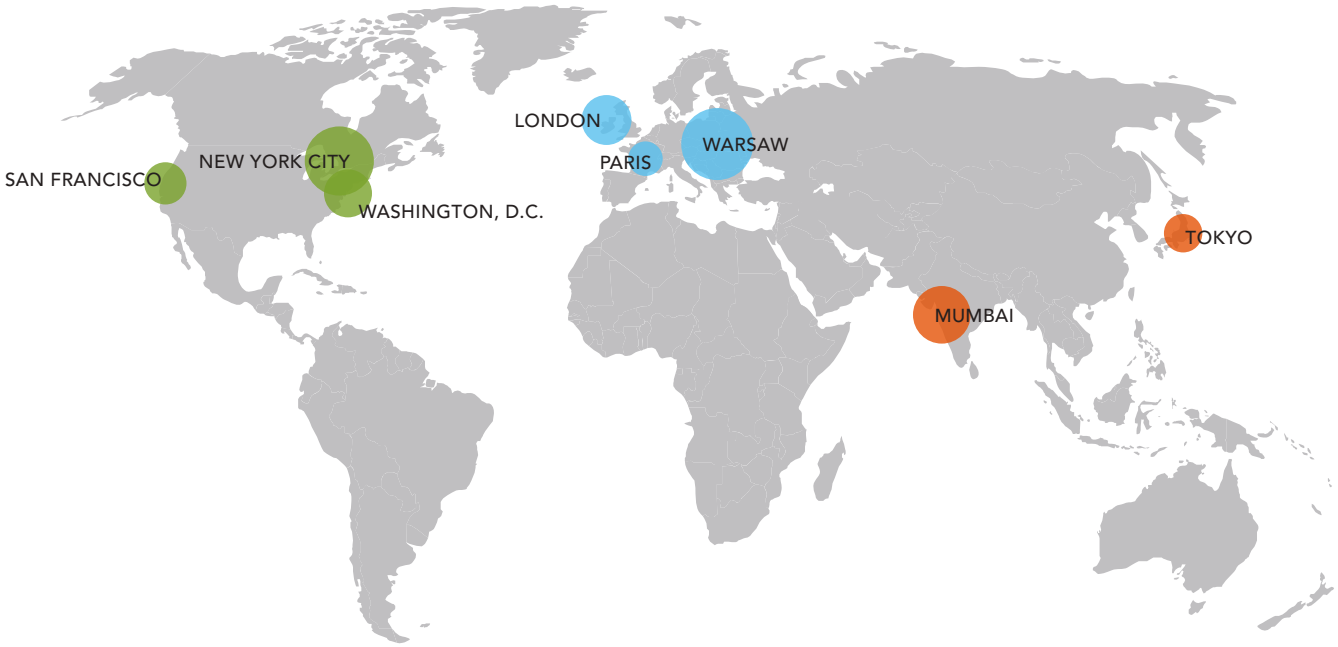
*All property benchmarks represent air-conditioned office properties that reported whole building data unless otherwise noted.

Energy Use Intensity of Office Properties by City

CURRENT YEAR

Over 50 percent of the global population currently resides in urban areas due to population growth and increasing urban migration.[9] The built environment produces up to 75 percent of GHG emissions in cities. To address this challenge, an increasing number of organizations, including the Institute for Market Transformation (IMT), C40 Cities Climate leadership Group, and Greenprint, have begun to promote city-specific benchmarking that showcases a more localized view of building performance.

This chart presents the median energy use intensity and energy cost intensity for Greenprint whole-building air-conditioned office properties in eight cities across the globe.



SAN FRANCISCO
371 properties

180 annual kWh/m²
(57.0 annual kBtu/ft²)
€16.0/m²

NEW YORK CITY
78 properties

254 annual kWh/m²
(80.6 annual kBtu/ft²)
€23.3/m²

LONDON*
225 properties

196 annual kWh/m²
(62.2 annual kBtu/ft²)
€41.5/m²

TOKYO
6 properties

153 annual kWh/m²
(48.6 annual kBtu/ft²)
€22.2/m²

WASHINGTON, D.C.
123 properties

193 annual kWh/m²
(61.3 annual kBtu/ft²)
€16.0/m²

PARIS
19 properties

151 annual kWh/m²
(47.8 annual kBtu/ft²)
€12.9/m²

WARSAW
18 properties

277 annual kWh/m²
(87.9 annual kBtu/ft²)
€23.8/m²

MUMBAI
4 properties

215 annual kWh/m²
(68.2 annual kBtu/ft²)
€16.6/m²

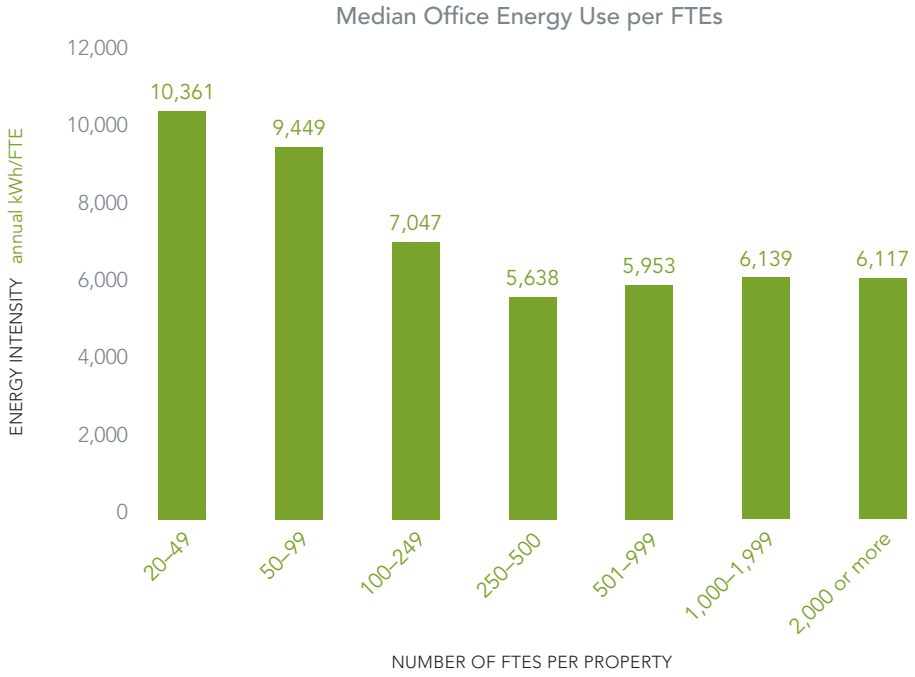
* The median energy intensity of 40 naturally ventilated office buildings in London is 186 kWh/m², not represented above.

Energy Use Intensity of Office Properties

CURRENT YEAR

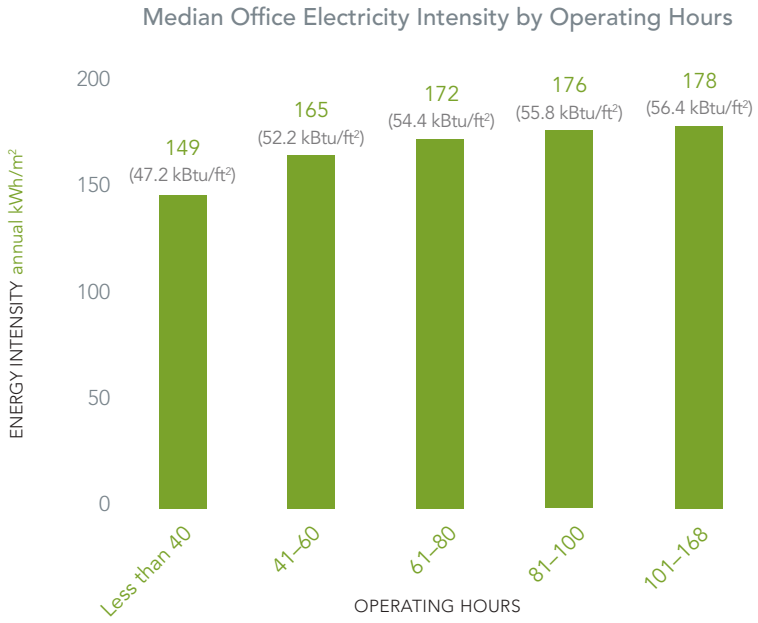
By Full-Time Equivalents

The chart below shows the median annual energy use per full-time equivalent (FTE) of Greenprint's global office portfolio with whole-building energy consumption. Generally, energy use per FTE decreases as occupants in the property increase.



By Operating Hours

The chart below shows the median electricity intensity by weekly operating hours of Greenprint's global office portfolios with whole-building energy consumption. The electricity intensity of office properties tends to increase as weekly operating hours increase.



Energy Case Study

BENTALL KENNEDY

GOAL
Increase operational efficiency through improved energy performance and reduced energy costs

APPROACH
Improvements to controls, maintenance, and operations

PROPERTY TYPE
Office

LOCATION
San Antonio, Texas, United States

BUILDING AREA
5,574 m^2 and 6,503 m^2
(60,000 ft^2 and 70,000 ft^2)

Low-cost operational improvements lead to strong environmental and economic wins

Westover Hills 1 and 2 are two medical office buildings that are part of a larger 12-hectare (30-acre) complex. After becoming the primary asset manager, Bentall Kennedy observed a number of operational inefficiencies, including failures in tracking and performing preventative maintenance, failures in maintaining work orders and warranties, and high property manager turnover. To resolve these issues, a number of steps were taken:

- A new property management firm was hired with experience in operational efficiency.
- Quarterly HVAC maintenance was consolidated under a single vendor.
- The building automation system was retrofitted with an interface that allowed better labeling and scheduling.
- An energy price contract was negotiated with the electric utility.

Results

Upgrades to building controls, maintenance, and operations yielded a number of positive results at little to no cost for Bentall Kennedy. Negotiations with the utility company led to a lower price for electricity in one of the buildings, and quarterly preventative maintenance calls revealed a number of HVAC failures that were remedied quickly.

Additional Benefits

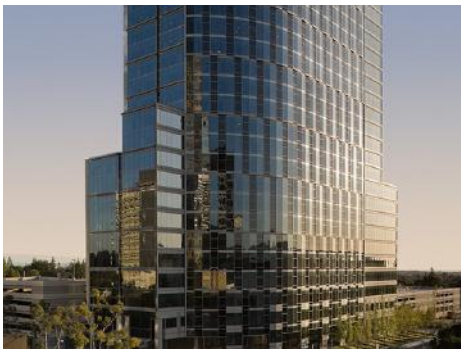
Well-maintained buildings typically lease faster, and the new maintenance schedule has led to fewer maintenance visits and lower operating costs. Tenants also reported higher overall satisfaction due to preventative maintenance, plus improved air flow and higher air quality.

Investment and Returns

$20,460	0.46 year
INVESTMENT	PAYBACK
$558,384	25%
CUMULATIVE SAVINGS OVER TEN YEARS	ANNUAL GHG REDUCTIONS

Energy Case Study

STEM AND CONSTELLATION PLACE, LLC



GOAL
Reduce peak energy demand and fees while managing energy consumption

APPROACH
Automated energy storage and intelligence software

PROPERTY TYPE
Commercial office building

LOCATION
Los Angeles, California, United States

BUILDING AREA
72,000 m^2 (775,000 ft^2)

Battery storage drives down peak electricity demand

Constellation Place, owned by Constellation Place, LLC (an affiliate of JMB Realty Corporation), is a 35-story office building and architectural landmark located in Century City, Los Angeles. As a Leadership in Energy and Environmental Design (LEED) Gold-certified building, Constellation Place has implemented numerous sustainability initiatives, including use of solar photovoltaics, a high-efficiency lighting control system, and mechanical equipment upgrades. It was even the first Los Angeles high-rise to generate a portion of its own electricity from fuel cells. Although these initiatives have reduced the building's total energy use and carbon footprint, they do not address the property's periods of peak electricity demand.

Peak demand periods are those infrequent times of high use when a property requires a large amount of energy over a short period. Peak demand typically occurs during the morning hours when building systems are starting up or in the afternoon when cooling loads are the largest. The peak-demand charges in California can account for more than half of a property's electricity costs while also complicating efforts to increase the efficiency and sustainability of the overall grid.

To address peak demand, Stem worked with the property owner to install a 54-kilowatt software-powered energy storage system. Stem's solution reduced peak demand by learning the building's unique energy profile and shifting to stored energy when demand charges are the highest. These changes enabled the property to reduce costs without disrupting building operations or requiring additional staff time.

The predictive software that powers the battery system also provides real-time visualization of the building's energy use, employing alerts and other tools that allow the building management team to optimize energy use and accurately predict costs. This platform supports the implementation of future energy projects by enabling accurate energy cost and consumption forecasting, as well as verification of the project results after the changes are made.

Impacts

5%
PEAK DEMAND REDUCTION

$103,139
TOTAL PROJECTED SAVINGS OVER 10 YEARS

21%
INTERNAL RATE OF RETURN

$58,320
STATE INCENTIVE PAYMENT

Additional Benefits

The system continuously learns and adapts to the building's energy profile. This will enable the property to enhance performance year after year while simultaneously protecting the tenants and owners from increasing demand charges, which continue to rise between 7 to 11 percent annually in many states.

Challenges

The permitting process required to connect the energy storage system with the electricity grid was arduous because distributed power systems are fairly new. With distributed storage becoming more common, utilities are growing familiar with the technology and developing better processes that enable more streamlined permitting and facilitate installation.

Energy Case Study

ABUNDANT POWER AND GRUBB

GOAL
Strengthen the tenant experience and lower costs through improved operational efficiency and lower energy use

APPROACH
Continuous mechanical systems data analytics and diagnostics

PROPERTY TYPE
Office

LOCATION
Charlotte, North Carolina, United States

BUILDING AREA
45,894 m^2 (494,000 ft^2) across three buildings

Continuous commissioning technology drives tenant satisfaction and savings

Grubb, a real estate operating company, deployed Abundant Power's IBAx data analytics and diagnostics system across three multitenant office buildings to leverage the existing control systems by data mining for comfort, asset health, and energy savings opportunities.

Project Background

- Deployed building performance algorithms against HVAC data to reveal comfort problems, improper equipment operations, and energy waste. This achieved the following:
  - Allowed early detection of cooling and heating failures: data analytics automates heat and flow balance checks across all pieces of equipment, immediately notifying the property manager of any irregularities.
  - Determined that nearly 70 percent of one facility's water-source heat pumps were running excessively despite control systems settings.
  - Reduced heating and cooling waste.
- Unified the building management approach and demonstrated performance to outside investors.

Cost

Across all three of the buildings, average cost savings exceed the monthly subscription fee for the software and services. The typical remedies identified through the program are minor and require little capital investment.

Additional Benefits

Running algorithms against live data streams provides ongoing commissioning in an automated, low-cost fashion. Easily accessible data and pre-built analytic modules also help property managers budget more accurately and with higher confidence.

Challenges

Through technological advancements, facility managers have access to millions of data points. Having the expertise and resources to consistently analyze the data is a challenge, while having access to the data creates opportunities to find savings and maintain high performance.

Results across the Pilot Buildings

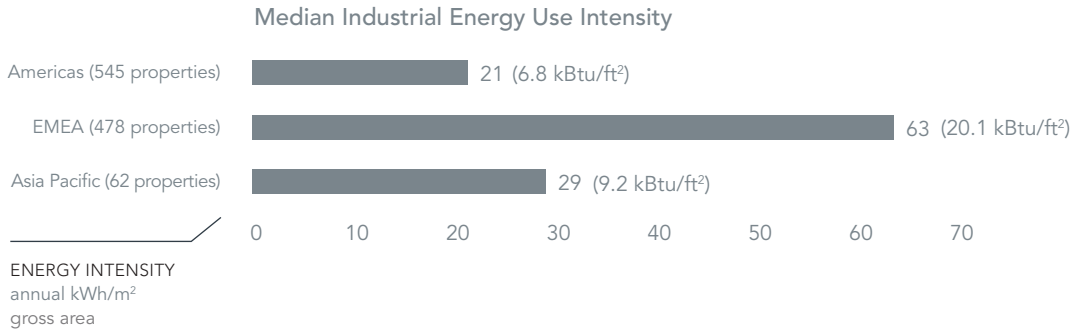
>15%	$63,864	525,132 kWh
AVERAGE ANNUAL ENERGY CONSUMPTION REDUCTION	YEARLY COST SAVINGS	YEARLY ENERGY SAVINGS

Energy Use Intensity of Industrial Properties

CURRENT YEAR

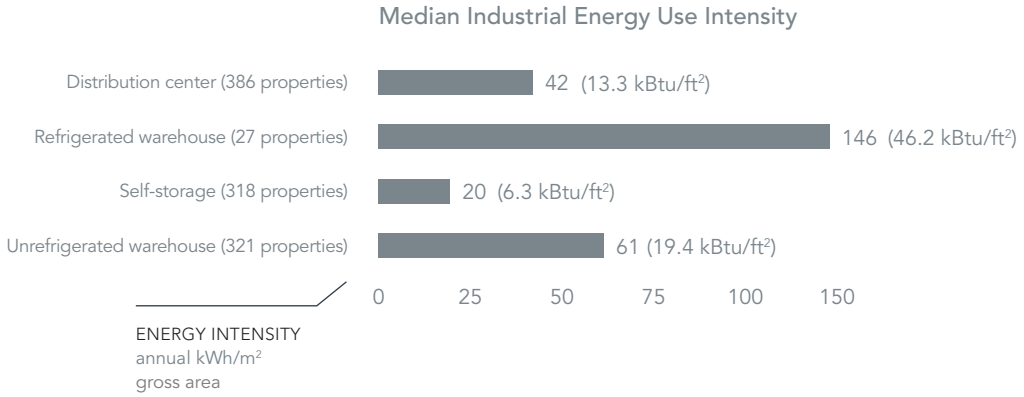
By Global Region

The chart below shows the median energy intensity of industrial properties with whole-building data broken down by region. Industrial properties in EMEA have higher energy intensities due to the subtype property mix.



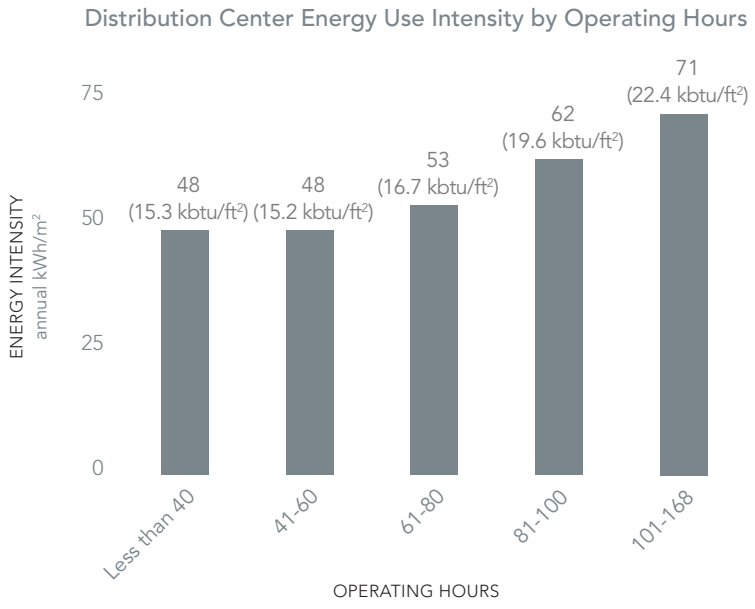
By Subtype

The chart below shows the median energy intensity of industrial properties with whole-building data broken down by property subtype. Clearly, refrigerated warehouses have a higher energy intensity due to high amounts of cooling.



By Operating Hours

The chart shows the median energy use intensity by weekly operating hours for Greenprint distribution center properties with whole-building energy data. The energy intensity of distribution centers generally increases as weekly operating hours increase.



Portfolio-wide case study

PROLOGIS

GOAL

Improve the environmental and financial performance of a large and distributed industrial portfolio through the use of the LEED volume certification standards and program

APPROACH

Investment in sustainable building certifications

PROPERTY TYPE

Industrial

LOCATION

Assets distributed throughout North and South America

BUILDING AREA

792,000 m^2 (8.525 million ft^2) across 33 properties

Building certification requirements drive environmental performance

To accelerate and streamline the adoption of sustainable building certifications, Prologis has committed to using the U.S. Green Building Council's LEED volume certification program. By the end of 2014, Prologis was the first industrial owner to use the LEED volume program. By the first quarter of 2015, Prologis had completed five projects with 28 projects registered throughout Canada, Mexico, and the United States, with future projects slated for Brazil.

Investment and Returns

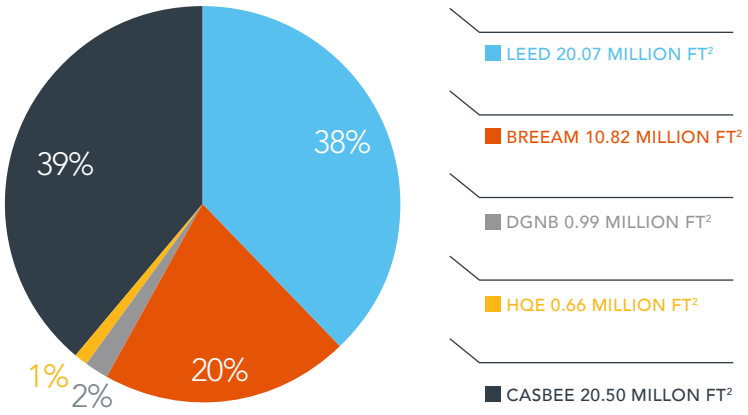
The LEED volume program has enabled Prologis to reduce its cost of certification by establishing a prototype design that enhances energy efficiency for tenants while streamlining the design and construction processes in the field. This has reduced tenant utility costs and extended the life-cycle cost of its buildings.

Global Building Certification Program

As part of its overall commitment to sustainability, Prologis has more than 4.9 million square meters (53 million ft^2) of sustainable building certifications. The graphic below shows the ratings systems used, along with the total area of the certified properties. The ratings systems used are:

- LEED: Leadership in Energy and Environmental Design
- BREEAM: Building Research Establishment Environmental Assessment Method
- DGNB: Deutsche Gesellschaft für Nachhaltiges Bauen
- HQE: Haute Qualité Environnementale
- CASBEE: Comprehensive Assessment System for Built Environment Efficiency

Prologis Portfolio by Sustainability Rating System



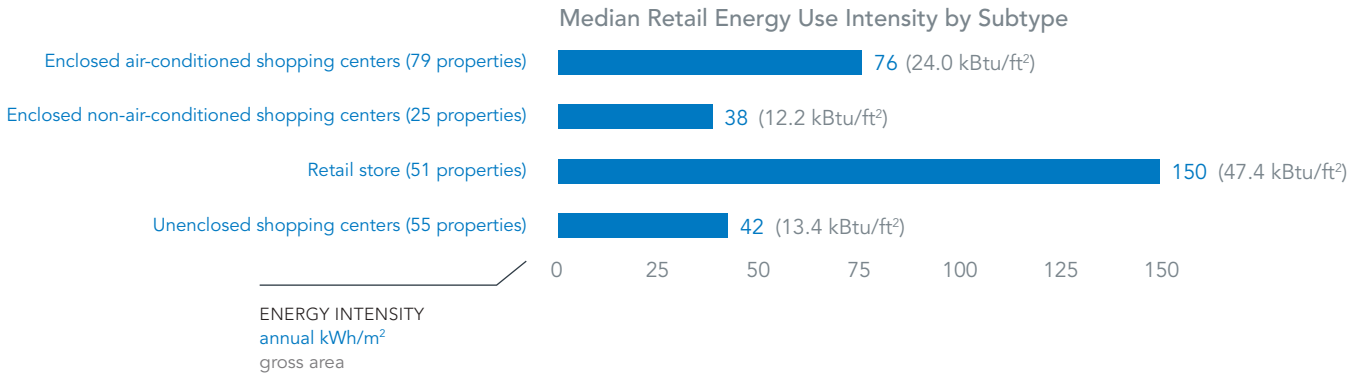
Prologis has invested in the certification of buildings for sustainability in order to provide best-in-class facilities that enhance the sustainability of tenants' operations and derive a competitive advantage by providing energy-efficient facilities at a competitive lease rate. This program is consistent with Prologis's focus on minimizing the environmental impacts of its operations and development activity in every market in which the company has invested.

Energy Use Intensity of Retail Properties

CURRENT YEAR

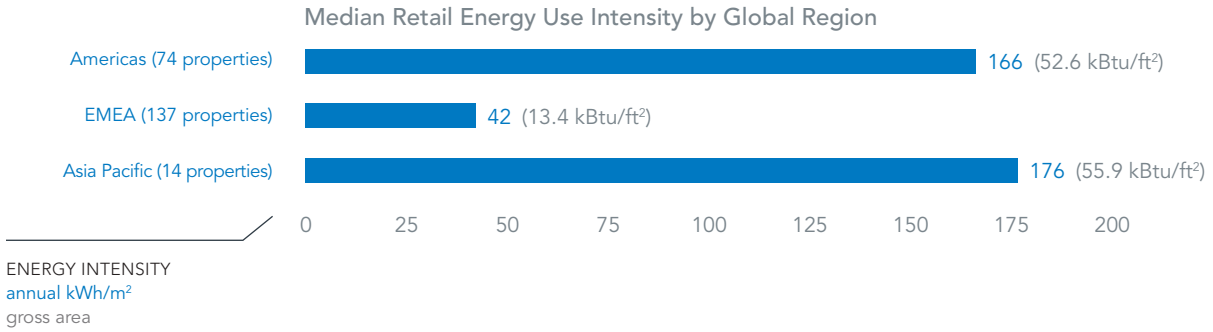
By Subtype

The subtype benchmark for retail properties is based on properties that provide whole-building energy data. Stand-alone retail stores are the most energy intensive, likely due to economies of scale that are more easily achieved in shopping centers.



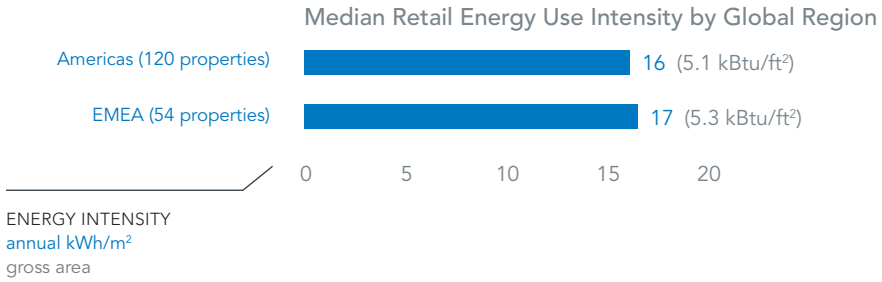
By Global Region with Whole-Building Data

The chart below shows the median energy intensity with whole-building data separated by regions. EMEA properties use the least energy per square meter of floor area, and Asia Pacific properties use the most. This is due to the variation in property subtypes in each region in the Greenprint portfolio. EMEA has more unenclosed shopping areas, whereas most retail properties in Asia Pacific are enclosed air-conditioned shopping centers.



By Global Region with Common Area Data

An examination of retail properties that provided common-area energy data by region shows that the energy intensity for the Americas and EMEA are similar. The intensity was calculated by dividing common-area energy by gross property area.



Energy Case Study

HEITMAN

GOAL
Improve energy efficiency and realize savings through a lighting program

APPROACH
Lighting replacement

PROPERTY TYPE
Retail

LOCATION
Coral Gables, Florida, United States

BUILDING AREA
22,527 m^2 (242,485 ft^2)

Sustainable lighting solution reduces utility and maintenance costs

Miracle Marketplace is a seven-story structure composed of three levels of retail space below four levels of parking. In its second year of ownership, Heitman began reviewing a lighting upgrade program for all parking lot and garage space fixtures. Replacing these lights became necessary when they began to fail. With this upcoming replacement expense, the asset management team decided to analyze the cost of implementing various lighting options.

Cost Analysis

Although replacing parking lot and garage space lighting with LEDs cost $170,000 more than the use of standard light bulbs, Heitman calculated a $90,000 annual energy cost savings with LEDs. With a 53 percent ROI on the incremental cost, the project payback is less than two years. Heitman will also benefit from reduced maintenance fees because LEDs last several times longer than standard bulbs, resulting in direct savings.

Results

LED LIGHTS

$385,000	1 Million kWh	$90,000
TOTAL COST	ANNUAL ENERGY SAVINGS	ANNUAL ENERGY COST SAVINGS

In this case, Heitman not only selected a sustainable and energy-saving lighting replacement option, but one that also enhanced property value.

Additional Benefits

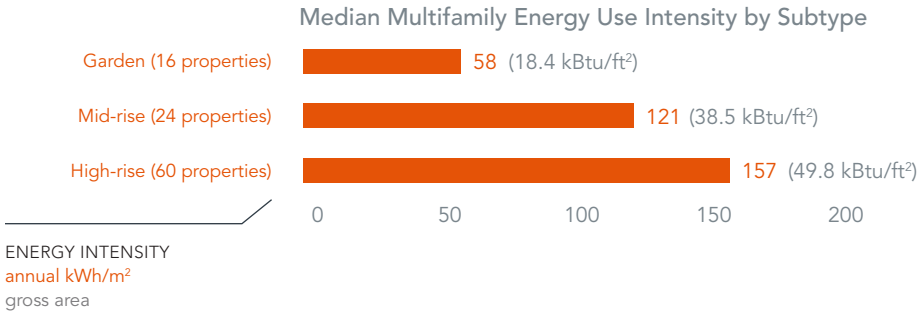
The lighting replacement improved area lighting coverage and security in the property's parking lot for tenants and visitors to the retail center.

Energy Use Intensity of Multifamily Properties

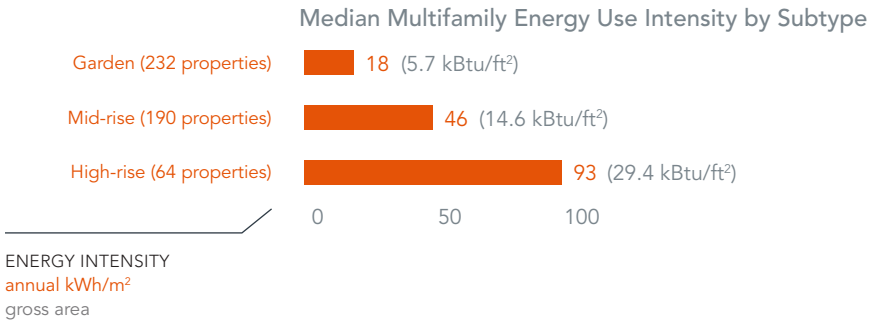
CURRENT YEAR

Energy intensity for multifamily properties is provided by property subtype with either whole-building or common-area data. Garden properties have the lowest energy intensity, and high-rise properties have the highest. A significant portion of high-rise properties in the Greenprint portfolio are located in New York City, where many use older, less-efficient fuel-oil boilers for heating.

By Subtype with Whole-Building Data



By Subtype with Common Area Data



Energy Case Study

GROSVENOR

GOAL

Pilot property performance improvement as part of a larger investment plan across the Grosvenor London Estate to create healthy and energy-efficient homes

APPROACH

Holistic retrofit using the Passivhaus's EnerPhit standard[10]

PROPERTY TYPE

Multifamily

LOCATION

London, England

BUILDING AREA

75.3 m^2 (811 ft^2)

Using the Passivhaus standard to retrofit a historic property

Grosvenor's terraced apartment units on Passmore Street were built in the 19th century. As part of its London Estate energy plan, Grosvenor targeted 19 Passmore Street as one of its first private rentals in London to achieve the Passivhaus EnerPHit standard for energy efficiency.

Passivhaus is an energy efficiency standard focused on reducing the heating demand and primary energy consumption of buildings. Thermal comfort is achieved through use of passive measures, including increased levels of insulation with minimal thermal bridges, passive solar gains, internal heat sources, and good indoor air quality provided by a ventilation system with high heat-recovery efficiency. Certification is achieved by meeting minimum criteria regarding space heating and cooling requirements, primary energy demand, infiltration rates, and thermal comfort.

The Passivhaus EnerPHit standard is a set of certification criteria for refurbished buildings, which are typically more challenging to retrofit. The primary challenge in retrofitting 19 Passmore to a Passivhaus standard was that this property is located in a designated conservation area. Grosvenor therefore needed to ensure that all sustainable additions maintained the original style of the property.

Upgrades

Upgrades to the properties included more efficient ventilation that filters 80 percent of large dust particles, bespoke triple-glazed mock sash windows, and improved insulation and airtightness.

Results

Grosvenor expects an 80 percent reduction in energy use for tenants, in line with the United Kingdom's national target of 80 percent GHG emissions reduction by 2050. The property is already outperforming neighboring ones, showing an 83 percent reduction in heating demand over a three-month winter data collection period in comparison to a similar unit that underwent a more traditional refurbishment.

840,000 kg CO_2e

REDUCTION OVER 60-YEAR LIFE OF BUILDING

Equivalent to 1,900 barrels of oil not consumed (estimated).

These retrofits are also intended to prove that a rental premium can be obtained through careful, coordinated communication regarding the wider benefits that energy efficiency has on health, well-being, and lifestyle.

Additional Benefits

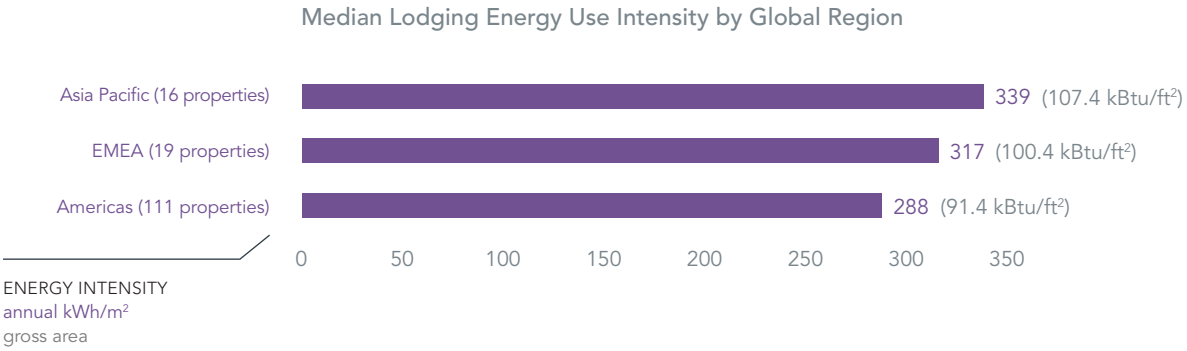
In addition to the improved environmental performance, this project has allowed Grosvenor to increase the knowledge and skills of its project managers, consultants, and contractors, allowing them to use these building techniques more widely and on additional projects.

Energy Use Intensity of Lodging Properties

CURRENT YEAR

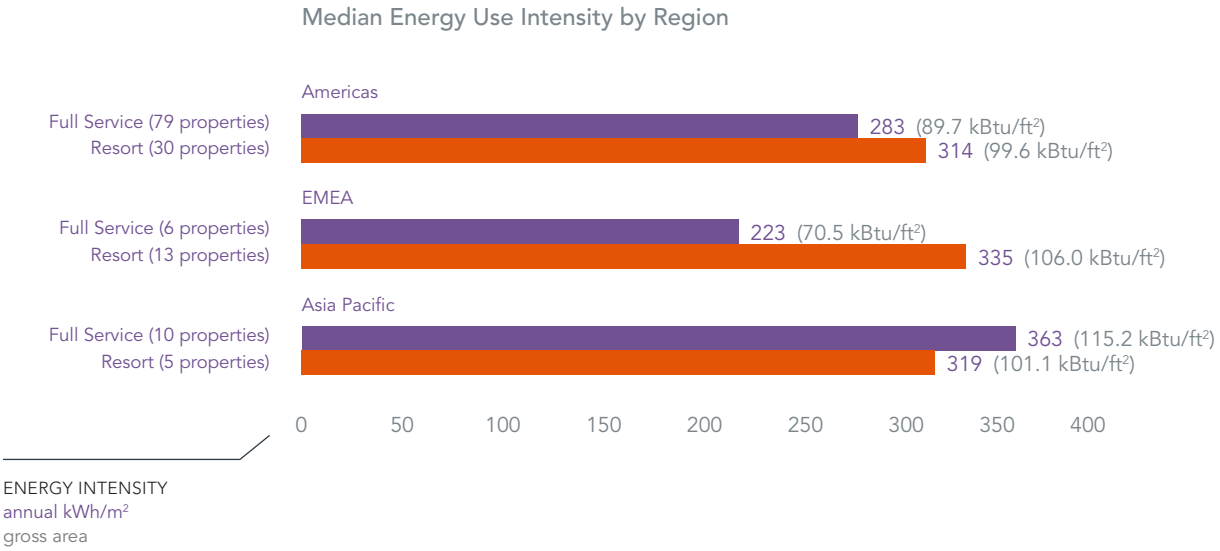
By Global Region

The chart below shows the energy intensity of hotels with whole-building data broken down by region. Energy intensity for each region varies slightly, with Asia Pacific being the highest and the Americas the lowest.



By Subtype

The chart below shows the energy intensity of hotels broken down by subtype and region with whole-building data. Overall, resorts use more energy per square meter of floor area than do full-service hotels. This may be due to the extra amenities that many resort hotels have, such as pools and spas.



Energy Case Study

STARWOOD HOTELS AND RESORTS

GOAL
Reduce energy consumption in line with Starwood's global environmental targets.

APPROACH
Holistic retrofit

PROPERTY TYPE
Lodging

LOCATION
Fesdu Island, Republic of Maldives

Creating a more sustainable and uncompromised luxury experience for guests

Starwood's W Retreat & Spa Maldives, a resort hotel on a private island, features 78 private suites for guests alongside staff accommodations. The resort also features three restaurants, two lounge concepts, an underground night club, a spa, an outdoor pool, and a fitness center. All electricity on the island is produced by diesel generators.

The Challenge

In order to operate a luxury resort with modern full-service amenities on a remote private island, Starwood needed to invest in projects that maximizes the efficiency of energy use and the reduction of waste while providing an uncompromised guest experience.

Furthermore, the Maldives is located just north of the equator in the Indian Ocean and have a naturally warm and humid climate, with temperatures ranging from 24 to 33 degrees Celsius (75 to 91 °F) year-round. In this climate, HVAC systems provide a comfortable and cooling environment for guests.

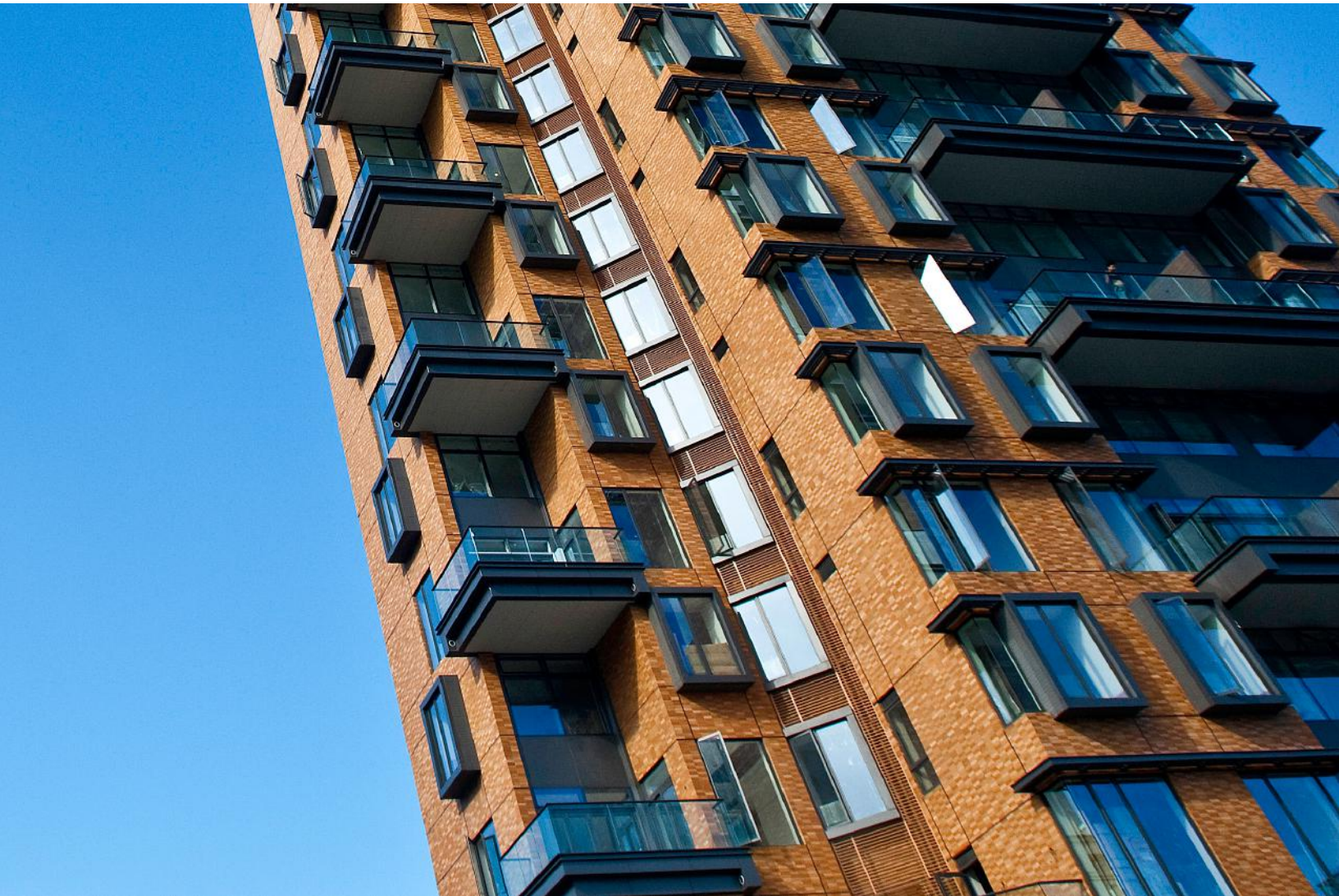
Upgrades Completed

- Replaced old air-conditioning units with efficient inverter-type AC units for staff accommodations and variable-refrigerant-flow units for guest villas and the spa.
- Installed an integrated room automation system to control AC units by reducing output when rooms are set at "unoccupied" and controlling temperature and humidity while guests are away or have doors open.
- Installed heat-recovery fixtures that use generator waste heat to provide continuous hot water.
- Upgraded guest-room lighting to light-emitting diodes (LEDs) from compact fluorescent lamps and replaced 50 televisions with more efficient LED sets.
- Installed motion sensors in lavatories to operate lights and exhaust fans.
- Installed water-saving fixtures in guest rooms and staff accommodations.
- Used facility wide power analyzer meters for each energy distribution area.
- Added recycling bins to encourage the separation of waste for easy on-site recycling, including grinding of glass bottles for a sand substitute and organic waste used as tree fertilizer.

Results

$1,448,392	25%	42%	$313,051
TOTAL INVESTMENT	REDUCTION IN PEAK ELECTRICITY LOAD	REDUCTION IN GENERATOR RUNNING HOURS FROM 2011 TO 2014	DIESEL OIL COST SAVINGS FROM 2013 TO 2014

4 GREENHOUSE GAS EMISSIONS—ANNUAL RESULTS



Methodology

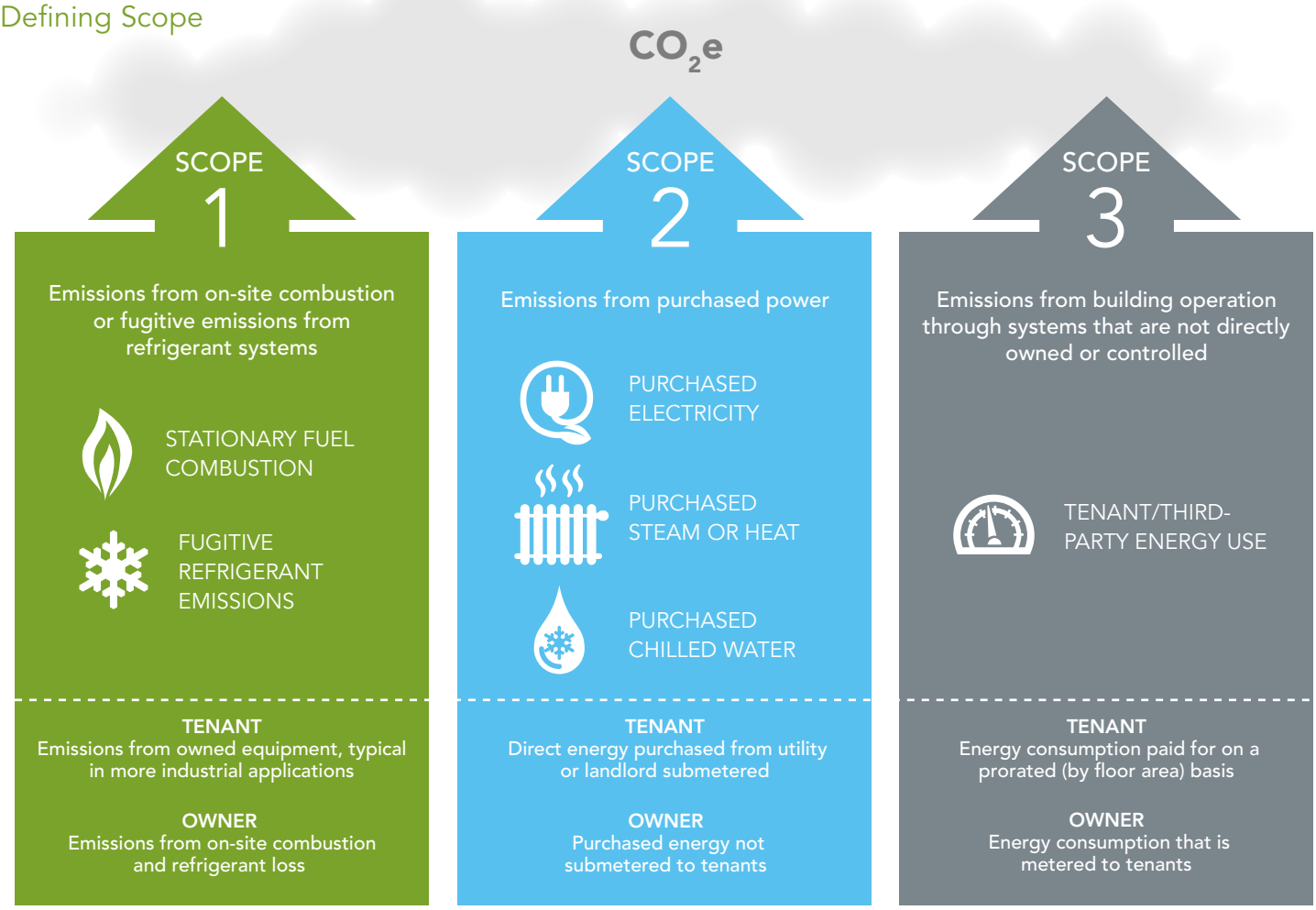
The Greenprint Performance Report™ separates greenhouse gas (GHG) emissions into three categories: Scopes 1, 2, and 3. This reporting system is aligned with the World Resources Institute/World Business Council for Sustainable Development (WBCSD) Greenhouse Gas Protocol. Categorizing emissions by scope enables separate accounting of GHG sources by different related entities, such as landlord and tenants, and also increases transparency.

Organizational Boundary

Greenprint has chosen to use the operational control approach, and defines areas under control to include all those where Greenprint members (landlord or tenant) have full authority to introduce and implement operating policies at the building.

Emissions are calculated from site energy consumption and exclude energy transmission and distribution losses, building construction, transport of materials, and waste disposal.

Defining Scope



Scopes 1+2+3 = Total Building Emissions

Calculating Greenhouse Gas Emissions

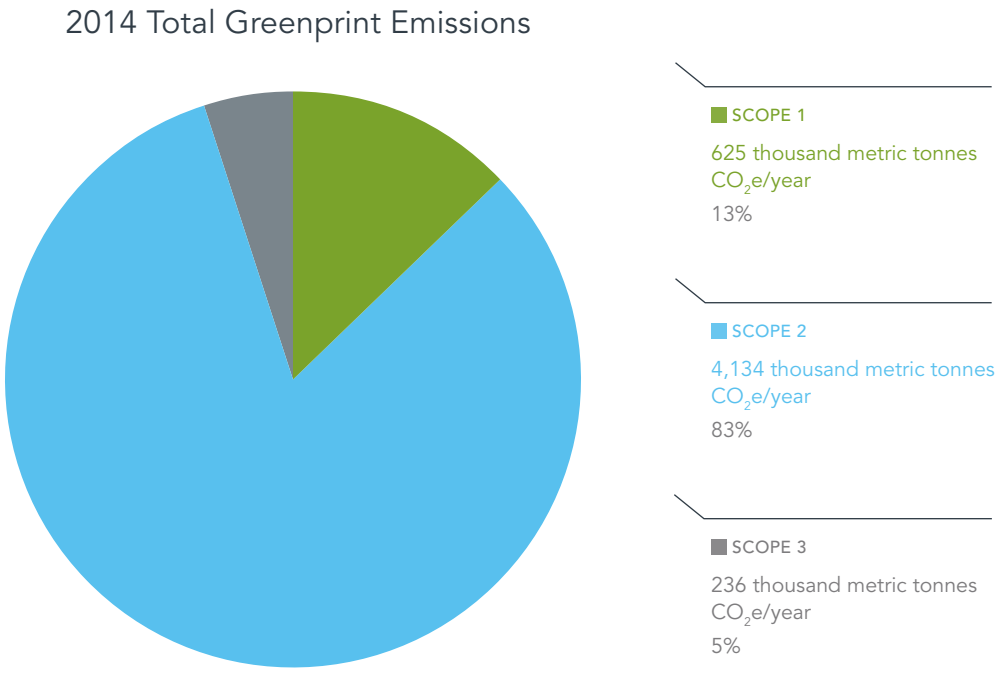
Energy [kWh] x Emissions Factor [kg CO_2e/kWh] = Greenhouse Gas Emissions [kg CO_2e]

Emissions factors are used to calculate the total CO_2e generated. Developing and applying accurate emissions factors are critical to reliable GHG emissions reporting. Emissions factors are listed in the appendixes. The same emissions factor sets have been applied to all sources since inception—2009.

Absolute Emissions

CURRENT YEAR

The chart below shows the absolute greenhouse gas emissions by scope, in line with the Greenhouse Gas Protocol. **Scopes 1 and 2** include emissions that Greenprint members have direct control over. **Scope 3** emissions for landlords are associated with the directly metered or submetered energy delivered to tenants. For occupiers, emissions are associated with energy provided by the landlord on a prorated basis (floor area).



Emissions by Property Type

YEAR OVER YEAR—LIKE FOR LIKE

This table shows the change in absolute emissions by property type from 2013 to 2014.

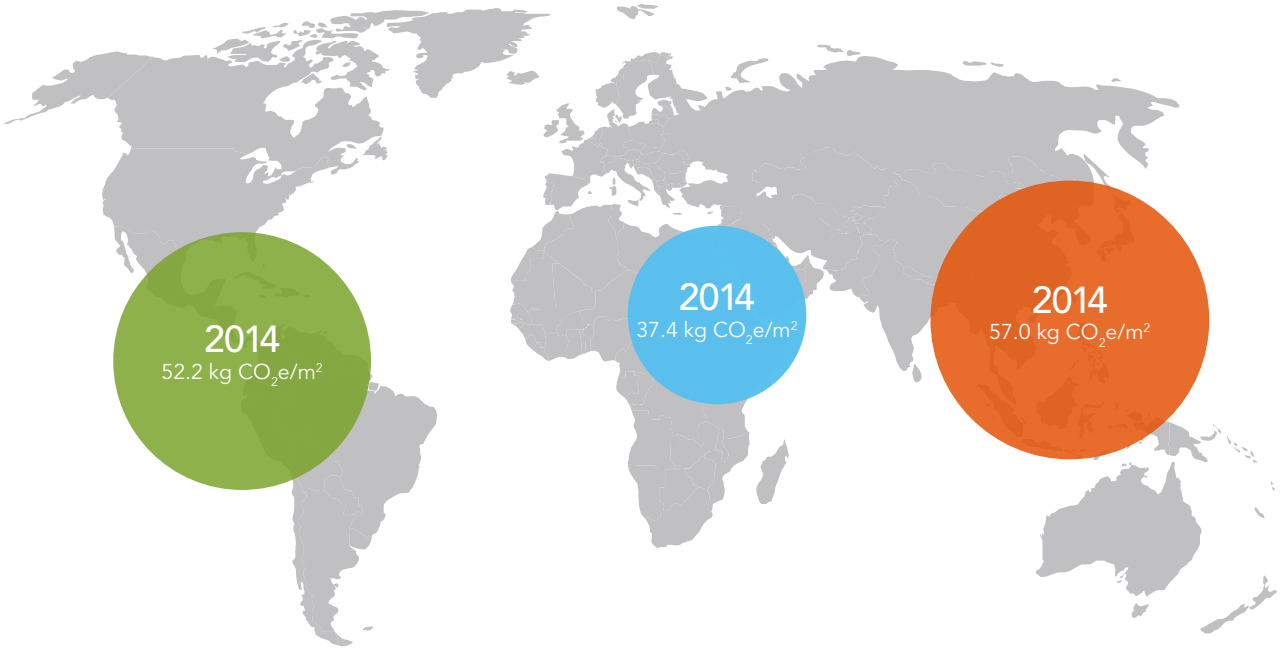
	Thousand Metric Tonnes CO_2e/Year			
	2013	2014	2013–2014 % change	2013–2014 occupancy % change
Office (1,460 properties)	2,895,801	2,814,071	-2.8% ↓	1.0%
Industrial (920 properties)	405,295	398,301	-1.7% ↓	0.1%
Retail (410 properties)	339,983	324,396	-4.6% ↓	0.2%
Multifamily (517 properties)	319,555	315,388	-1.3% ↓	0.1%
Hotel/lodging (139 properties)	499,301	488,300	-2.2% ↓	-3.5%
GREENPRINT TOTAL	4,459,934	4,340,456	-2.7% ↓	0.3%

Emissions by Global Region

YEAR OVER YEAR—LIKE FOR LIKE

This map illustrates the change in emissions (Scopes 1, 2, and 3) from 2013 through 2014 for the like-for-like portfolio for each global region.

- Americas
- EMEA
- Asia Pacific



AMERICAS
2,454 properties
57.8 million m^2 (622 million ft^2)

2013: 3,402 thousand metric tonnes CO_2e
2014: 3,333 thousand metric tonnes CO_2e

2.0 % decrease

EMEA
893 properties
18.9 million m^2 (203 million ft^2)

2013: 736 thousand metric tonnes CO_2e
2014: 696 thousand metric tonnes CO_2e

5.5% decrease

ASIA PACIFIC
99 properties
4.1 million m^2 (44 million ft^2)

2013: 322 thousand metric tonnes CO_2e
2014: 312 thousand metric tonnes CO_2e

3.2% decrease

The Greenprint portfolio's emissions decreased 2.7% on a like-for-like portfolio basis.

Emission Equivalencies by Global Region

YEAR OVER YEAR—LIKE FOR LIKE

The chart below details the change in the Greenprint portfolio's emissions from 2013 to 2014. Properties consuming the same amount of energy can emit different amounts of CO_2e for several reasons, including:

- Utility fuel mix: Emission factors reflect the type of fuel used at the power source. For instance, Australia produces much of its power from coal plants and has an emission factor of 0.89 Kg CO_2e/kWh, whereas Sweden uses nuclear energy and hydropower and therefore has a low factor of 0.017 Kg CO_2e/kWh
- Government approach: Policies and incentives to decarbonize the power supply vary. For example, renewable energy incentives are widely available in Switzerland.
- Geographic location: The viability and use of on-site renewable energy technologies and purchase of renewable energy contracts varies by location according to natural factors, such as water availability and sunlight intensity.

Emission Equivalencies by Global Region—Like for Like

	Americas		EMEA		Asia Pacific	
	2013	2014	2013	2014	2013	2014
Number of properties	2452		893		99	
Area (million m²)	57.8		18.9		4.1	
Occupancy rate (%)	93.9%	94.2%	92.4%	92.7%	88.2%	87.9%
	Difference	% change	Difference	% change	Difference	% change
Total energy (million kWh)	-212	-2.3% ↓	-167	-7.2% ↓	-21.3	-3.4% ↓
CO_2e emissions (thousand mt)	-69	-2.0% ↓	-40	-5.4% ↓	-10	-3.1% ↓

Emission Reduction Equivalents

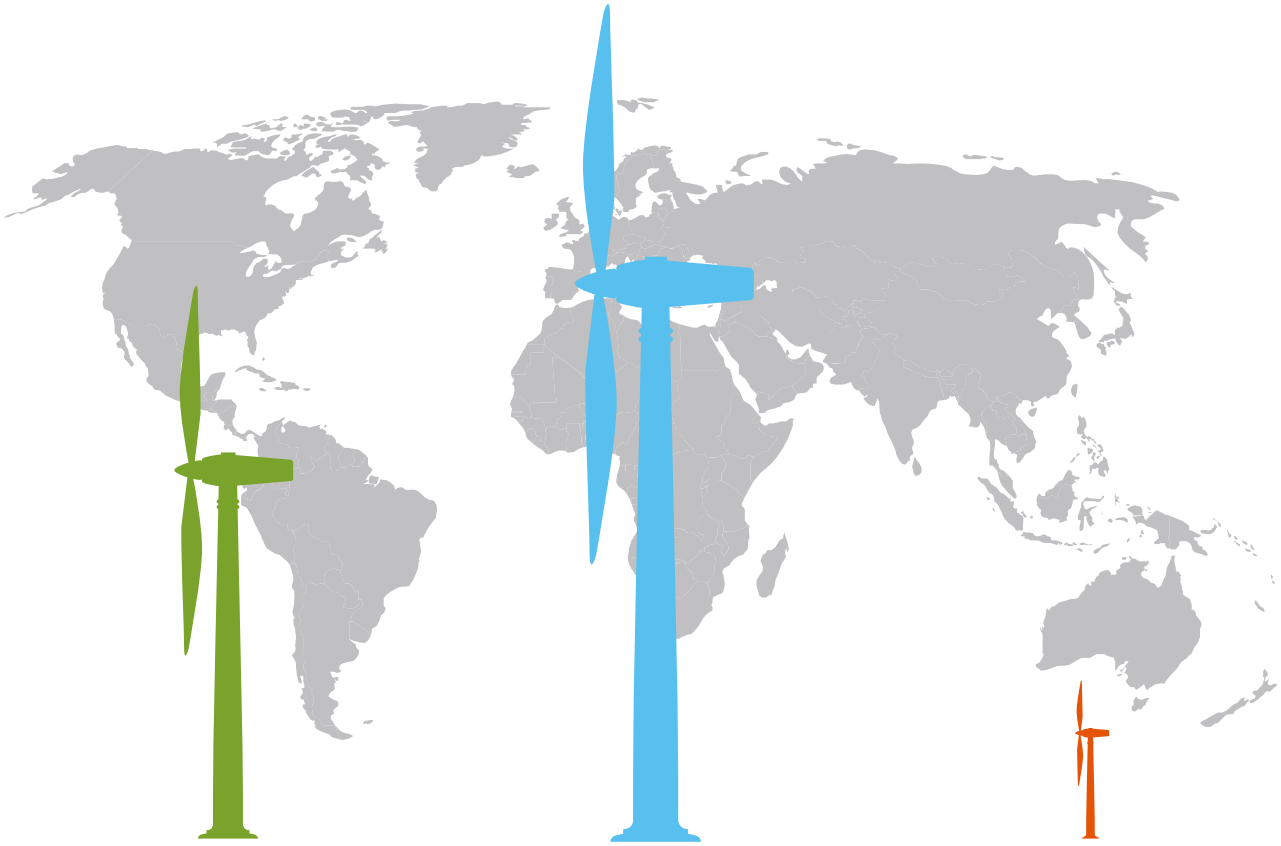
	Americas	EMEA	Asia Pacific
Barrels of oil not consumed	160,761	93,426	23,672
Cars taken off the road	14,553	8,458	2,143
Trees planted	1,772,487	1,030,077	261,000
Homes not consuming energy	6,307	3,666	928
Metric tonnes of coal not burned	33,679	19,573	4,959

Emissions Averted Due to Renewable Energy

CURRENT YEAR

Greenprint members are committed to increasing the use of on-site renewable energy, such as the use of rooftop photovoltaic panels and the procurement of renewable energy from power suppliers. The Greenprint portfolio showcased a 0.9 percent increase in renewable energy procurement from 2013 through 2014.

Many Greenprint members generate on-site renewable energy that is sold to third parties such as power supply companies. This renewable energy is not included in the chart below because it is not consumed on site. The graphic below illustrates the GHG emissions averted through use of renewable energy by global region.



AMERICAS
2014: 191,470 MWh
80,340 MT CO_2e

EMEA
2014: 272,555 MWh
100,316 MT CO_2e

ASIA PACIFIC
2014: 3,824 MWh
2,301 MT CO_2e

2014 Avoided Emissions Equivalents[4]

383,870
BARRELS OF OIL NOT CONSUMED

80,421
METRIC TONNES OF COAL NOT BURNED

Greenhouse Gas Case Study

COMMONWEALTH PARTNERS

GOAL
Achieve a 20 percent decrease in carbon emissions

APPROACH
Comprehensive property retrofit (with an innovative approach to transportation)

PROPERTY TYPE
Office

LOCATION
Los Angeles, California, United States

BUILDING AREA
231,894 m^2 (2.5 million ft^2)

Holistic retrofit not only improves building environmental performance but also reduces transport emissions

City National Plaza is composed of two 52-story office towers, one 4-story pavilion building with 2 subterranean parking levels and a retail level pavilion. It is a LEED Existing Building: Operations & Maintenance Gold-certified property and has an Energy Star rating of 92. CommonWealth Partners took a holistic look at upgrading the environmental performance of the property, making improvements to energy, water, indoor air quality, and transportation.

Project Highlights

Sustainability features implemented at City National Plaza include the implementation of a building automation system to reduce the property's energy and maintenance costs, an update of lighting systems to promote the use of task lighting, use of occupancy sensors, and better on/off controls to improve tenant office equipment management. Water savings were targeted through restroom retrofits on over 75 floors of the property, installation of dual flush valves on toilets and low-flow faucets, and replacement of the cooling tower.

CommonWealth Partners considered methods for improving the sustainability of the indoor tenant space, including:

- Use of sustainable cleaning products for 98 percent of the building's area, improving indoor air quality and decreasing air pollutants.
- Installation of high-performance filtration equipment and entry mats to mitigate against environmental contaminants.

Results

38%	40%	$4.3 Million
ENERGY REDUCTION	WATER REDUCTION FOR INDOOR PLUMBING	ANNUAL SAVINGS

Transportation Initiatives

In addition to the building improvements, CommonWealth Partners promotes a number of alternative and low-emission transportation options. City National Plaza's proximity to public transit allows an average of 600 passengers to be diverted to public transportation daily via natural gas–fueled shuttles. Offering another convenient option is Zipcars and bicycles, provided on site, which reduces the number of personal cars on the road during the day.

CommonWealth Partners also has the long-term goal of carbon neutrality. In support of this target, the company investigates innovative ways to support a clean-fuel economy so tenants at CommonWealth properties can also reduce their carbon footprint. After a review of new technologies, CommonWealth installed eight electric-vehicle charging stations at City National Plaza. In 2014, more than 300 drivers used the charging stations, resulting in over 10,000 kg (22,000 lbs) in GHG savings. A robust alternative transportation education program was also implemented to ensure that tenants are aware of all available options, making City National Plaza a leader in reducing the environmental impact of not only the property, but also of its tenants and local stakeholders.

Greenhouse Gas Case Study

SOLARIA

GOAL
Provide integrated high-power photovoltaic (PV) energy generation and energy efficiency along with effective daylighting and attractive aesthetics

APPROACH
Precise shading analysis and estimation of energy generation for atrium areas that are exposed to direct sunlight

PROPERTY TYPE
Retail

LOCATION
Hefei, China

BUILDING-INTEGRATED PV AREA
1,150 m^2 (12,378 ft^2) across the retail mall roof

Building facade turned into renewable energy–generating asset

A retail mall in Hefei, China, is currently being designed by Skidmore, Owings & Merrill (SOM), a global architecture, engineering, and urban planning firm. SOM included use of Solaria's solar technology in the design to provide a building-integrated photovoltaics (BIPV) solution that would bring a unique combination of energy efficiency, daylighting, and renewable energy generation to the project. SOM proposed use of Solaria's solar energy–generating window technology for 1,100 m^2 of atrium skylights.

Results

When constructed, the mall will raise the bar for energy efficiency and renewable energy generation in China. The BIPV system enables the atrium glass to provide the mall's interior with attractive aesthetics, a uniform view, and effective daylighting while also generating renewable electricity for the mall. In addition, Solaria's BIPV provides a good level of insulation, as well as an effective shading coefficient and U-value. The project is expected to generate ROI in two to three years, with low incremental costs and compelling economics for a leading-edge design.

Solaria demonstrated its capabilities using its advanced simulation tools to estimate energy generation for atrium areas and account for local irradiations. The results showed that the BIPV solution was estimated to produce 48 MWh/year with a 76KWp BIPV system on the three glass roofs combined.

> "The complexity of this project made it challenging to identify the best solutions. Solaria's trusted BIPV solution is a clear fit, and we are excited to see just what this innovative technology can accomplish in these unique conditions."
>
> Larry Chien, Managing Director, SOM

Challenges

Potential inefficiencies due to pollution and the need for frequent cleaning, high levels of direct solar radiation, and moderate cloud cover could result in shading during certain seasons or times of the day. In addition, light and heat gain and loss through the facade needs to be balanced with daylighting and space conditioning.

Breakdown of Emissions by Energy Type

CURRENT YEAR

Buildings use a mix of energy types and sources. Electricity is usually drawn from the grid, while fuels are burned on site for heating and cooking. Thermal energy is regionally available and is typically provided as steam, hot water, or chilled water.

ELECTRICITY
-2.0%
2013: 8,589 million kWh
2014: 8,417 million kWh

+

FUEL
-7.1%
2013: 2,648 million kWh
2014: 2,461 million kWh

+

THERMAL ENERGY
-3.9%
2013: 1,008 million kWh
2014: 968 million kWh

=

ENERGY CONSUMPTION
energy
-3.3%
2013: 12,247 million kWh
2014: 11,847 million kWh

EMISSIONS
–74,336
METRIC TONNES

+

EMISSIONS
–34,483
METRIC TONNES

+

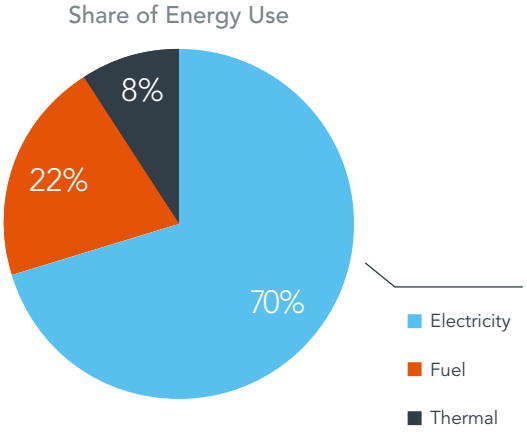
EMISSIONS
–10,660
METRIC TONNES

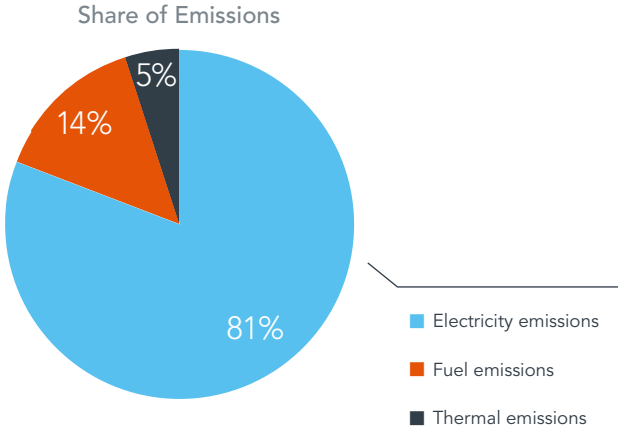
=

CO_2e EMISSIONS
emissions
-119,478
metric tonnes

Breakdown of Energy Types in Relation to Emissions

These charts show that the average emissions factors for electricity are higher than those for fuel and thermal energy. Electricity consumption creates more emissions because it is generated off site and a portion of the energy is lost due to combustion, transmission, and distribution.

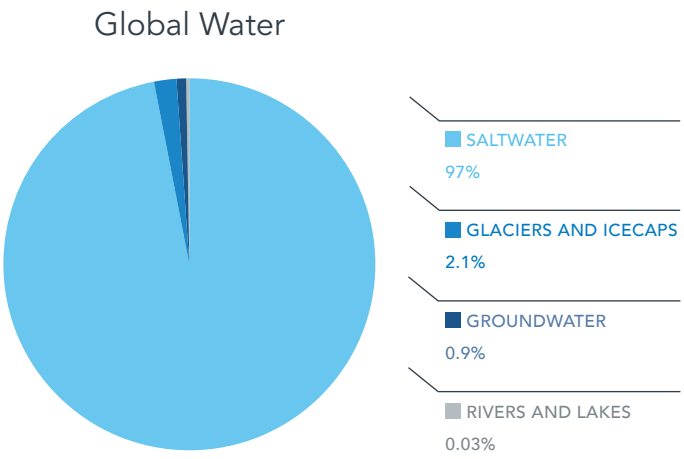




5 WATER—ANNUAL RESULTS

Global Water Scarcity

Freshwater represents only 3 percent of all water available on earth, with up to 70 percent of that locked in glaciers and ice caps.[11]

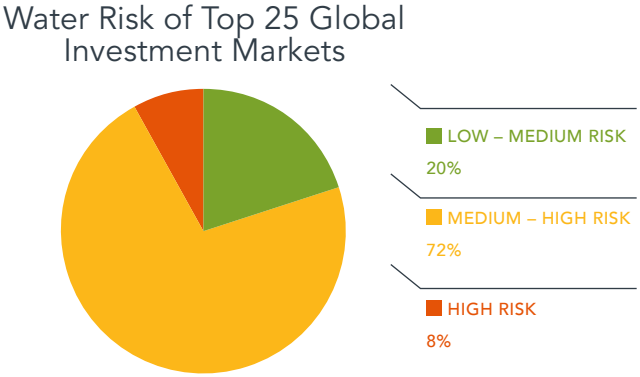


Water scarcity currently affects every continent and over one-fifth of the global population—1.2 billion people and growing! Another 1.6 billion people, or almost one-quarter of the world's population, face economic water shortages: countries lack the infrastructure necessary to take water from rivers and aquifers to where it is needed.[12] By 2025, it is estimated that over 1.8 billion people will be living in countries with absolute water scarcity, and two-thirds of the world population could be living in water-stressed conditions.[13]

To combat water scarcity, cities in Australia and the United States enacted strict water conservation rules, such as limits on landscape irrigation, water allotments for commercial agriculture, and restrictions on specific industrial uses.[14] In São Paolo, Brazil, which has also experienced a significant multiyear drought, the city water board is rationing water to support more efficient use.[15]

Water use has been growing at more than twice the rate of population increase in the past century due to industrial applications and varying degrees of economic and social gains. These conditions coupled with the variability of the natural water cycle will exacerbate water management issues in the foreseeable future.[16] Real estate owners should consider how water scarcity in vulnerable markets will affect their business. There are financial risks such as increased water costs and diminishing property values due to the depopulation of water-stressed regions, and operational risks associated with supply disruptions that might affect mechanical systems and standard operations.

According to the World Resources Institute's Aqueduct Water Risk Atlas, 72 percent of the top global investment markets face medium to high water risk, and 8 percent face high water risk.[17] In order to keep pace with increasing water scarcity, the global real estate industry should be aware of the risk and begin to consider new technologies and services that can help reduce consumption and increase reuse and recycling of the water used at their properties.



Water Use

YEAR OVER YEAR—LIKE FOR LIKE

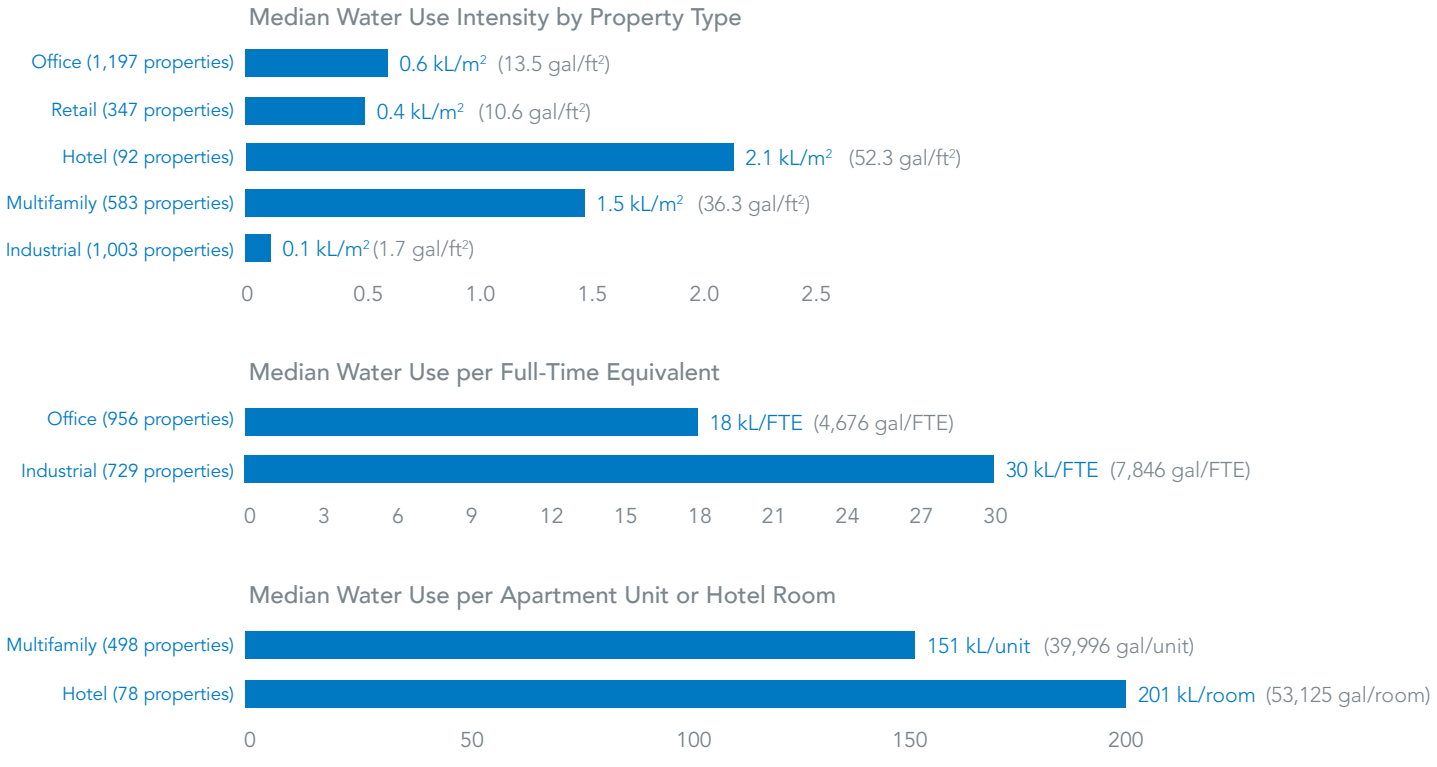
Within commercial real estate, water is used for irrigation of the grounds, heating and cooling, sanitation, kitchen services, and other miscellaneous requirements. Real estate owners can support water reductions through installation of low-flow fixtures, use of smart-irrigation technologies, and application of HVAC efficiencies. This report takes into account water consumption specifically for indoor use when available, and whole-meter data otherwise. This year, water use declined across all property types.

	Number of properties	2013 (kL)	2014 (kL)	Change 2013–2014
Office	955	14,716,293	14,462,393	-1.7% ↓
Retail	284	6,380,003	6,185,170	-3.1% ↓
Industrial	588	1,516,605	1,496,900	-1.3% ↓
Multifamily	469	24,014,919	23,593,553	-1.8% ↓
Hotel	87	8,947,705	8,795,817	-1.7% ↓
GREENPRINT	2,383	55,575,525	54,533,834	-1.9% ↓

Water Use Intensity

CURRENT YEAR

Water use intensity varies significantly by property type and function. The charts below provide a variety of intensity metrics to highlight several ways in which water use can be benchmarked.



Water Use Case Study

AVALONBAY

GOAL
Reduce potable water use in a water-stressed region

APPROACH
Portfolio-wide efficient fixture retrofit program

PROPERTY TYPE
Multifamily

LOCATION
Multifamily units in California, United States

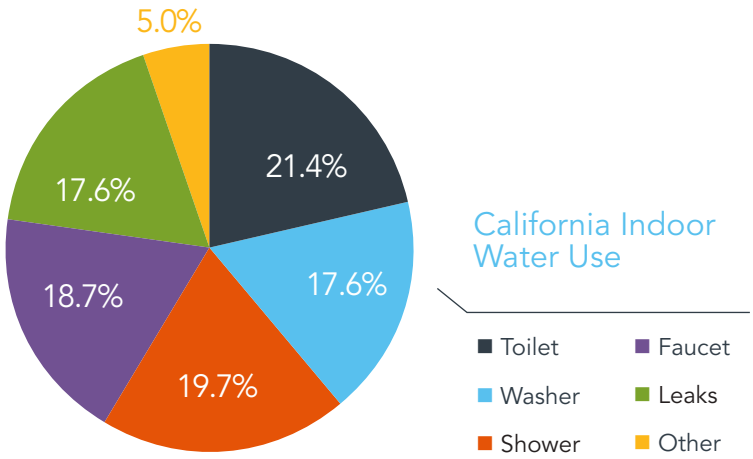
Leveraging rebates to fund water efficiency retrofits

As part of its overall corporate responsibility strategy and in response to California's drought, AvalonBay retrofitted toilets in 2,546 apartments throughout the state. Toilets are the highest indoor water users in California homes, according to data from the California Department of Water. Rebates from the Los Angeles Department of Water and Power were used to fully fund these retrofits.

AvalonBay's 2014 Savings

$0	3,575	4.2
INVESTMENT	TOILETS REPLACED	MILLION GALLONS ANNUAL WATER SAVED

The annual amount of water saved through these retrofits is equivalent to one year of indoor water use for 67.7 California households.[18]



California shows average indoor water consumption levels similar to those in the rest of the United States, with toilets constituting the primary water consumer.[19] As AvalonBay realized, putting resources into upgrading toilets is an excellent method for reducing water consumption at multifamily properties.

Future Work

In 2015, AvalonBay has instituted a California water task force to bring water efficiency projects to scale and support resident engagement and education on water issues.

Water Use Case Study

SONAE SIERRA

GOAL
Reduce dependence on water-stressed reservoirs, increase reuse of potable water, and decrease water costs

APPROACH
Innovative technology implementation

PROPERTY TYPE
Retail

LOCATION
São Paulo, Brazil

BUILDING AREA
11,809 m^2 (127,111 ft^2)

Innovative approach to water management at a retail center

Plaza Sul is a large shopping center in São Paulo composed of 220 stores. Although São Paulo is supplied by eight separate water systems, it is in a continuous state of water scarcity. In accordance with Sonae Sierra's priority of resource resilience, an innovative method of resource use was sought for Plaza Sul, which was highly dependent on water-stressed utilities. To improve the water efficiency of the property, the following opportunities for improvement were identified:

- Implement a system capable of treating 4,500 kiloliters (1.2 million gallons) of wastewater per month through membrane bioreactor (MBR) ultrafiltration to treat and reuse water from toilets, cooling towers, and irrigation for nonpotable use.
- Capture and treat groundwater by locating an artesian well that was used as a replacement for the traditional utility supply.
- Convert a warehouse and construct a system with the capacity to treat 7,500 kiloliters (2.0 million gallons) per month of captured groundwater for iron and manganese.

A project partner provided all the investment for implementation of the reuse station and artesian well. This partner also operates the station and well, plus produces the water. Plaza Sul now purchases water from that partner at half the cost of water from the local public utility.

This project is an example of Sonae Sierra's focus on solutions for effective resource resilience. The company is committed to protecting its assets against higher costs and the risks of resource constraints—in this case, water shortages.

Results

Implementation of this water project led to a 36 percent reduction in the consumption of potable water and, through water reuse, a 50 percent reduction in generated wastewater. Because all consumed water generates the same cost for sewage disposal, there were additional financial benefits to this project, including a 25 percent reduction in total water and sewage costs for Plaza Sul.

3,500 kL	2,000 kL	€98,000
REDUCTION IN DEMAND ON LOCAL UTILITY	UTILITY REUSED WASTEWATER	YEARLY SAVINGS

Plaza Sul is a great example of how to turn global challenges, such as water scarcity, into business opportunities.

6 WASTE—ANNUAL RESULTS

Waste Generation by Office Properties

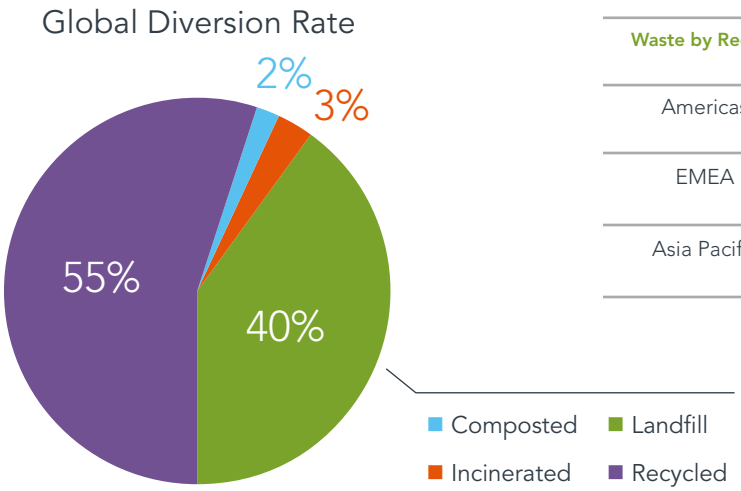
CURRENT YEAR

The world's population has become increasingly urban and affluent over the past century, leading to a tenfold increase in waste production.[20] Improper waste disposal can cause numerous environmental and public health concerns. The global cost of waste management is projected to rise from $205 billion per year in 2010 to an estimated $375 billion by 2025. Currently, the primary method of waste disposal is use of landfills, where the waste slowly breaks down, contributing to GHG emissions through the release of methane from the anaerobic digestion of organic matter.

In order to counteract the costs and negative environmental effects of excess waste, cities and countries are trying to reduce the amount of waste they produce by diverting it from traditional landfills to recycling or reusing materials. For example, San Francisco has set an ambitious goal of achieving zero waste by 2020. To reach this goal, the city enacted strong waste reduction policies, partnered with a private company to test and operate new infrastructure, and created a culture of recycling and composting, which has resulted in high participation in recycling and an 80 percent landfill diversion rate in 2010.[21] Much like San Francisco, leading real estate owners, including some Greenprint members, are working with their tenants and occupants to reduce or divert waste from landfills.

Greenprint collects waste information in the form of diversion methods, which include landfill, recycling, incinerating, and composting, as well as waste type (e.g., the type of material that is being discarded). For this year's report, Greenprint members were able to record 2014 waste data for 823 properties.

The chart below shows that landfill disposal and recycled waste account for a majority of the waste stream reported for Greenprint properties.



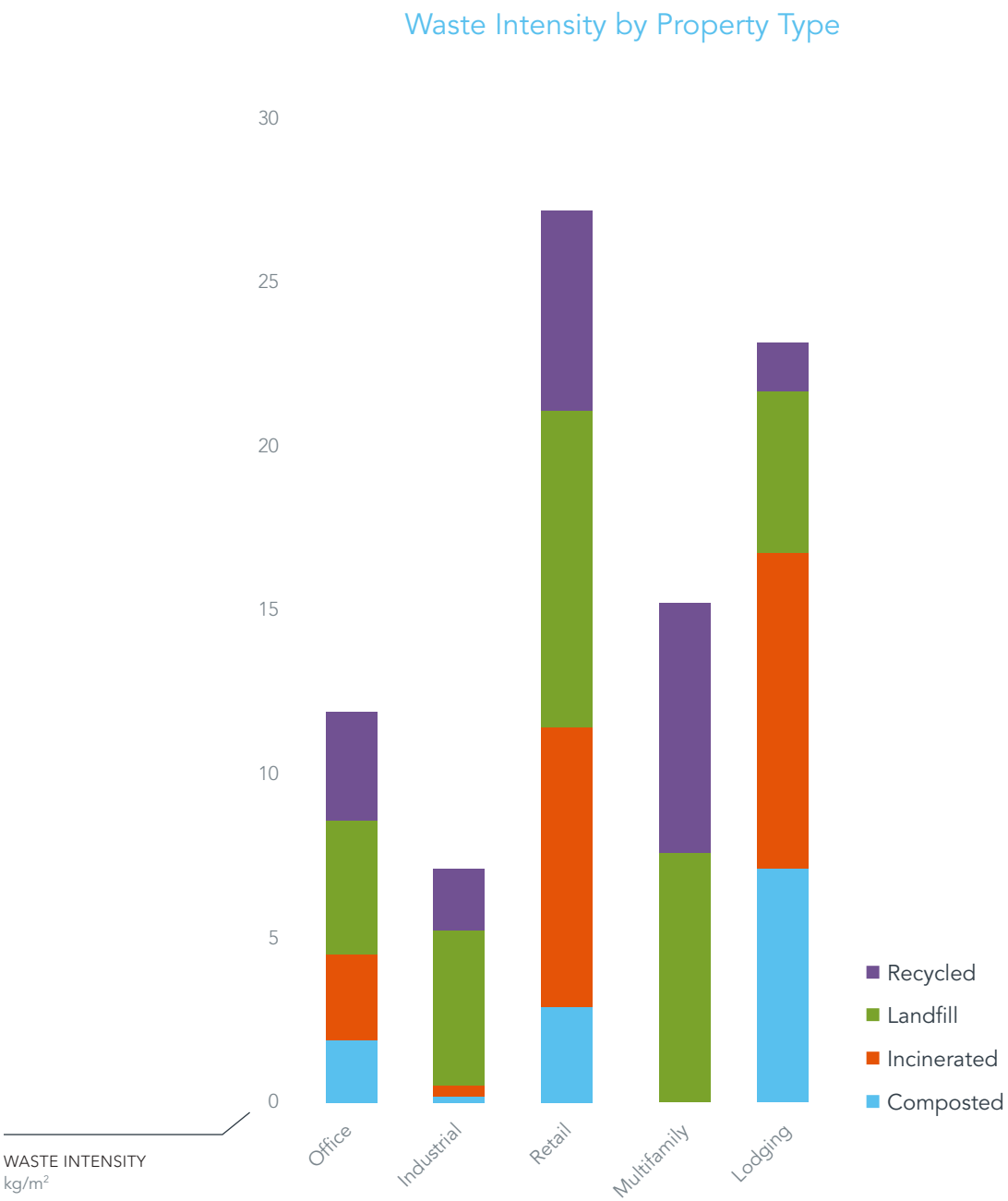
Waste by Region	# of properties	kg/m²	lb/ft²
Americas	605	32.7	6.7
EMEA	171	77.0	15.8
Asia Pacific	20	20.0	4.1

Globally, across markets and property types, collection of data on waste can be challenging because the waste stream is varied, decentralized, and inconsistent. Also, waste management contracts typically have not included language regarding capturing of metrics, so some haulers may not have the infrastructure to quantify the amount and types of waste collected, creating an opportunity for improvement. A conscious shift in consumption, waste production, and disposal is needed before more land is converted to landfill or air is polluted by waste incineration.

Waste Intensity by Property Type

CURRENT YEAR

The chart below shows the waste intensity by property type and waste disposal method across the Greenprint portfolio. Industrial properties create the least waste per square meter of gross floor area while retail properties create the most. Landfill disposal and recycling are the most prominent disposal methods for all property types in the Greenprint portfolio. In order to improve performance over time, the property owners should first attempt to reduce waste intensities across all property types and then increase recycling rates.



Waste Case Study

JAMESTOWN

GOAL
Divert 60% of waste from landfills through a waste management program

APPROACH
Composting program

PROPERTY TYPE
Mixed use, retail

LOCATION
New York, New York, United States

BUILDING AREA
103,502 m^2 (1,114,087 ft^2)

Progressive waste management through tenant engagement

Chelsea Market is an enclosed mixed-use office and retail space, famous for its many food-related tenants. Jamestown set out to increase the number of tenants that compost their organic waste. After strong education and communication efforts directed at back of house restaurants and food retailers, the number of tenants participating in the composting program increased significantly, diverting large amounts of organic waste from landfills.

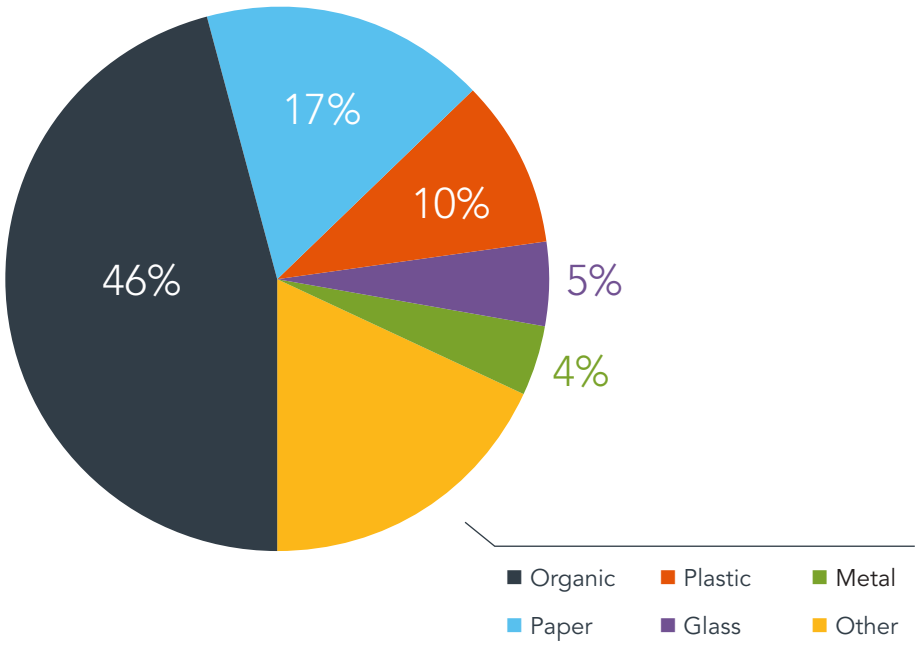
This initiative will serve as an example to other commercial properties as they prepare to comply with new waste and composting legislation in New York City.

Results

50%
ADDITIONAL TENANT PARTICIPATION

937
METRIC TONNES ORGANIC WASTE DIVERTED FROM LANDFILLS (ESTIMATED)

Global Waste Composition



Organic waste makes up 46 percent of global solid waste and 59 percent of waste in landfills.[22] In landfills, organic waste breaks down through anaerobic digestion, generating large amounts of methane emissions. By diverting 937 metric tonnes of waste from landfills, Jamestown prevented a net release of 186 metric tonnes of CO_2e, equivalent to the emissions from consuming 433 barrels of oil.[23]

7 BIODIVERSITY

In order for an ecosystem to thrive, a diverse variety of plants and animals is essential. Biodiversity provides ecosystem services that are vital for the commercial real estate industry.[24] Examples of ecosystem services include stormwater management, microclimate regulation, air quality improvement, greenhouse gas sequestration, plant pollination, and recreation.

In urban areas, biodiversity has decreased due to the development of green space, population increases, unsustainable consumption, and global warming.[24] With 60 percent of the projected urban area for 2030 yet to be built, there will likely be an impact on biodiversity and the ecosystem services it supports.

Biodiversity degradation leads to an unstable and less-resilient ecosystem. An unhealthy ecosystem can have a negative impact on real estate longevity and lead to food scarcity, reduction of freshwater, poor air quality, and rising temperatures in urban environments. To mitigate these impacts, some commercial real estate owners are working to better integrate their buildings into the greater urban ecosystem by developing with biodiversity in mind.

Reporting frameworks, including the Global Reporting Initiative (GRI), the Carbon Disclosure Project (CDP), and the Global Real Estate Sustainability Benchmark (GRESB), incorporate indicators that assess biodiversity planning across investment portfolios, evaluating how biodiversity relates to the activities and operations of an organization. By considering their properties' relationship to biodiversity, real estate owners and investors have a better view of their properties' current and future performance. Benefits for real estate companies include happier tenants, improved stakeholder relations, new market opportunities, and long-term stability.

This new section of the Greenprint Performance Report™ aims to show innovative projects undertaken by Greenprint members to improve biodiversity at their properties and within their communities.

Biodiversity Case Study

COMMONWEALTH PARTNERS

PROPERTY TYPE
Office

LOCATION
Seattle, Washington, United States

BUILDING AREA
115,947 m^2 (1,248,047 ft^2)

Promoting the environmental benefits of green roofs

Russell Investment Center is a 42-story, 1.2 million-square-foot Class A office property in downtown Seattle. The 23,000 square foot (2,137 m^2) roof on the 17th floor of the building is one of the first green roofs in Seattle and serves as a model for promoting green roofs and biodiversity at other properties in the area. The garden spans 10,719 square feet and is planted in twelve 36-inch deep soil beds, two-thirds of which are planted with drought-resistant and native plants, including native pines, bamboos, and grasses. Because some parts of the garden experience heavy rainfall, the roof is equipped with a rain catchment system that collects water throughout the year. The plants are irrigated with this water using drip irrigation, reducing the use of potable water by 86 percent compared with conventionally irrigated landscaping.

Benefits to Owner

Assists in stormwater management

Improves building insulation

Decreases consumption of nonpotable water through collection of rainwater

Benefits to Tenant

Provides recreation space, including walking paths

Benefits to Environment

Reduces urban heat-island effect

Provides alternative habitat for native plants, insects, and birds

Helps convert carbon dioxide to oxygen

Biodiversity Case Study

GROSVENOR

GOAL
Create a more sustainable ecosystem for urban bees and a greener urban area

LOCATION
London, England

Developing green space to support urban bees

The declining bee population worldwide is alarming because of the significant role bees play in pollinating food crops and wild plants.

To combat the decline in urban biodiversity, Grosvenor has started a "Creating a Buzz" initiative. This program has led to the development of green-roof ecosystems and "parklets"—pocket gardens—with seating and bee-friendly plants to sustain a growing number of urban beehives. Grosvenor's urban ecosystems support a community of up to 50,000 bees that produce local honey. By making a significant contribution to green space, Grosvenor wants to educate the local community on the benefits of healthy bee populations and biodiversity in urban environments and work alongside other landowners to improve green infrastructure more widely. In addition, this initiative has helped Grosvenor forge a closer relationship with the community. Proceeds from the sale of the Grosvenor honey go back into the community through Grosvenor's Living Communities Fund, which supports community projects to improve cohesion and young people's personal development.[25]

Biodiversity Case Study

PARKWAY

APPROACH
Innovative chiller disposal

BUILDING LOCATION
Orlando, Florida, United States

Repurposing a decommissioned HVAC system to enhance local marine habitat

Background

Artificial reefs have evolved dramatically over the years as marine scientists have learned which materials serve as effective anchors for new coral reefs and which do not. The success rate for providing needed reef habitats has greatly improved as a result.

Step 1: Establishment

Today, artificial reefs are typically created by sinking large, heavy metallic (or concrete) objects such as old ships, planes, train cars, etc., in relatively shallow coastal ocean waters. These large, heavy objects provide critical anchor points for thousands of tiny organisms that make up the base layer of any living reef. They also provide safe places for smaller fish to hide from larger predators and often make for interesting recreational dive sites for people.

Step 2: Growth and Evolution

Once a base layer of living reef organisms is "anchored" to these large objects, vibrant and complex living reef ecosystems can begin to develop. The result after several years of continued growth is a beautiful and teeming underwater ecosystem that any fish or diver would be delighted to visit.

Parkway's Project

One Orlando Centre is a 19-story, Class A office building located on the north end of downtown Orlando, Florida.

In conjunction with major HVAC system upgrades completed at One Orlando Centre in 2014, Parkway's director of engineering spearheaded an innovative approach to the disposal of the building's original chiller plant. Rather than send the over 23,000 kilogram (50,000 pound) decommissioned chiller plant to the scrapyard, he worked with Reefmaker Artificial Reefs & Marine Ecosystems and Trane to safely decommission and dispose of the old chiller plant at the bottom of the Gulf of Mexico. There, it has begun its new purpose as the anchor for one of Florida's newest artificial reef habitats. Trane shared the cost of decommissioning the old chiller plant and transporting it to the new reef site.

Parkway's innovative contribution of a large, heavy chiller plant to the Gulf floor is the latest in a long list of artificial reef projects designed to enhance the coastal ecosystems of Florida's Gulf waters. The chillers were sunk to a depth of 27 meters (90 ft) in the Gulf of Mexico along with a granite plaque commemorating their origins at One Orlando Centre, 19 stories above downtown Orlando.

8 LONG-TERM PERFORMANCE

Historical Performance

GROWTH—SINCE INCEPTION

The growth of data from new member submissions and existing members resulted in additional historical data. The Greenprint portfolio has been updated to account for new and revised data, from 2009 to 2014.

602 PROPERTIES **2009**

5,224 PROPERTIES **2014**

16 MILLION SQUARE METERS IN **2009**
(172 MILLION SQUARE FEET)

112 MILLION SQUARE METERS IN **2014**
(1.2 BILLION SQUARE FEET)

15 MEMBERS IN **2009**

36 MEMBERS IN **2014**

Greenprint's goal to reduce overall building emissions in its portfolio by **50% BY 2030** compared with the 2009 baseline is in line with the Intergovernmental Panel on Climate Change (IPCC) greenhouse gas stabilization target.

Performance Snapshot

SINCE INCEPTION—LIKE FOR LIKE

ENERGY CONSUMPTION

energy
-11.0%

2009: 5,475 million kWh
2014: 4,874 million kWh
973 properties

CO_2e EMISSIONS

carbon
-10.8%

2009: 2,072 thousand mt
2014: 1,849 thousand mt
973 properties

COST

cost of energy[3]
-4.5%

2009: €279 million ($356 million)
2014: €266 million ($340 million)
796 properties

ELECTRICITY

electricity
-12.7%

2009: 4,391 million kWh
2014: 3,834 million kWh
973 properties

WATER USE

water
-9.7%

2009: 9.6 million kL (2.5 billion gal)
2014: 8.7 million kL (2.3 billion gal)
535 properties

COST

cost of water
+9.0%

2009: €11 million ($14 million)
2014: €12 million ($15 million)
431 properties

2009 to 2014 Emission Reduction Equivalents[4]

518,607
BARRELS OF OIL NOT CONSUMED

46,948
CARS TAKEN OFF THE ROAD

20,347
HOMES NOT CONSUMING ENERGY

5,717,974
TREES PLANTED

108,648
METRIC TONNES OF COAL NOT BURNED

Greenprint Carbon Index™

YEAR OVER YEAR

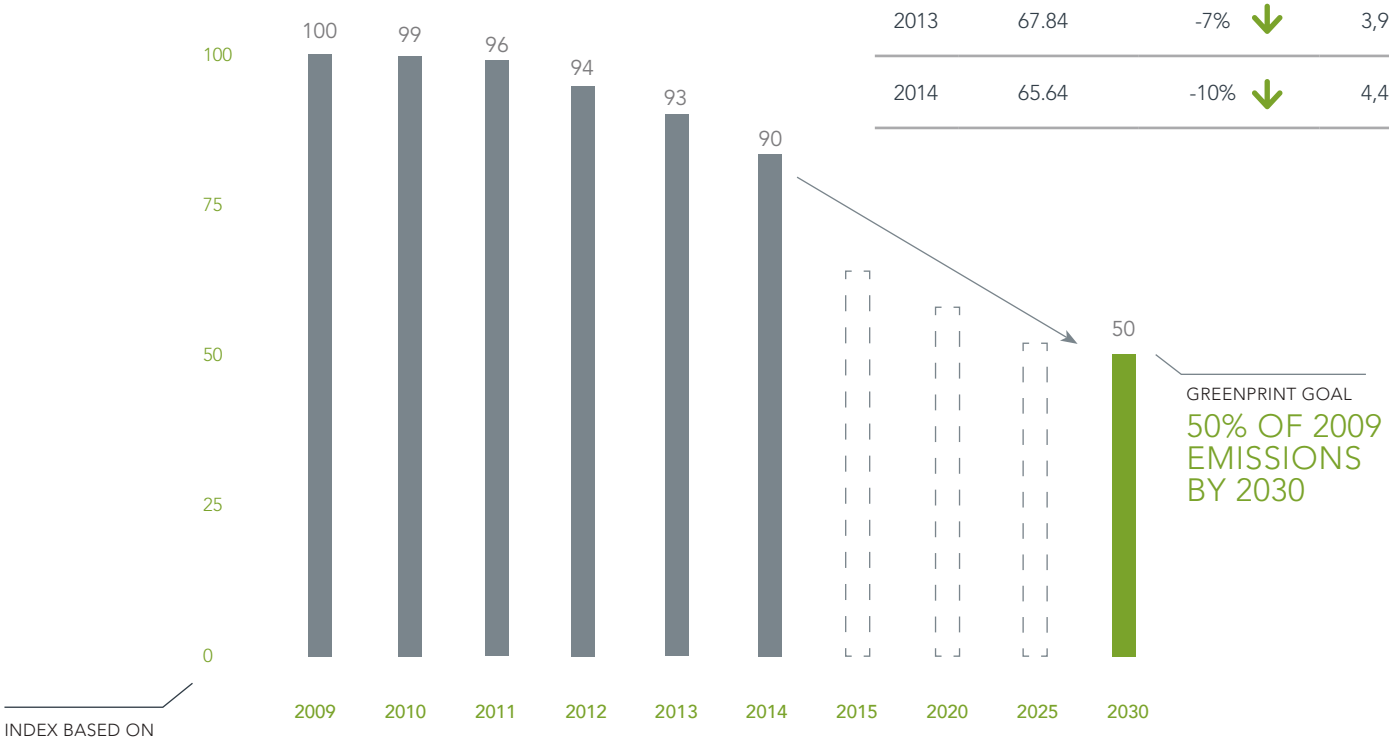
Greenprint's mission is to lead the global real estate community toward value-enhancing carbon-reduction strategies that support global greenhouse gas stabilization by 2030 in line with IPCC goals. The Greenprint Carbon Index™ (GCX) was created to track progress toward this goal. The GCX is calculated as an annual time series of normalized emissions intensity of the Greenprint portfolio.

The GCX is set at 100 starting in 2009. The GCX is based on the total greenhouse gas emissions divided by the associated total floor area for submitted properties, measured in kg CO_2e/m^2. The GCX is weighted by the same property-type proportion for each year of the index. This is done to ensure that the property mix from year to year remains constant. The Greenprint portfolio is becoming more diversified and creates a proxy for a balanced property-type allocation. This year, the property-type weightings are equivalent to the Distribution by Property Type on page 6 in the Executive Summary of this report.

The historical index is updated and restated for various reasons:

- As new members join Greenprint, their historical data are put into the database to improve the size and scale of the GCX.
- Properties adjust energy use after the end of the reporting year to reflect updated invoice and meter information.
- Data errors are caught and corrected after the initial release of the GCX. In 2014, Greenprint ran more than ten validation routines through a multi-user workflow to check for consistent and accurate data at each property. (See the appendixes.)
- Measurement of building boundaries is improving because floor area is more accurately defined, allowing for better disaggregation between whole-building and tenant areas.

Year	Annual emissions intensity (kg CO_2e/m^2)	% change in emissions intensity from 2009	Number of properties
2009	73.33	—	1,216
2010	72.60	-1% ↓	1,601
2011	70.43	-4% ↓	2,051
2012	69.20	-6% ↓	2,627
2013	67.84	-7% ↓	3,915
2014	65.64	-10% ↓	4,498



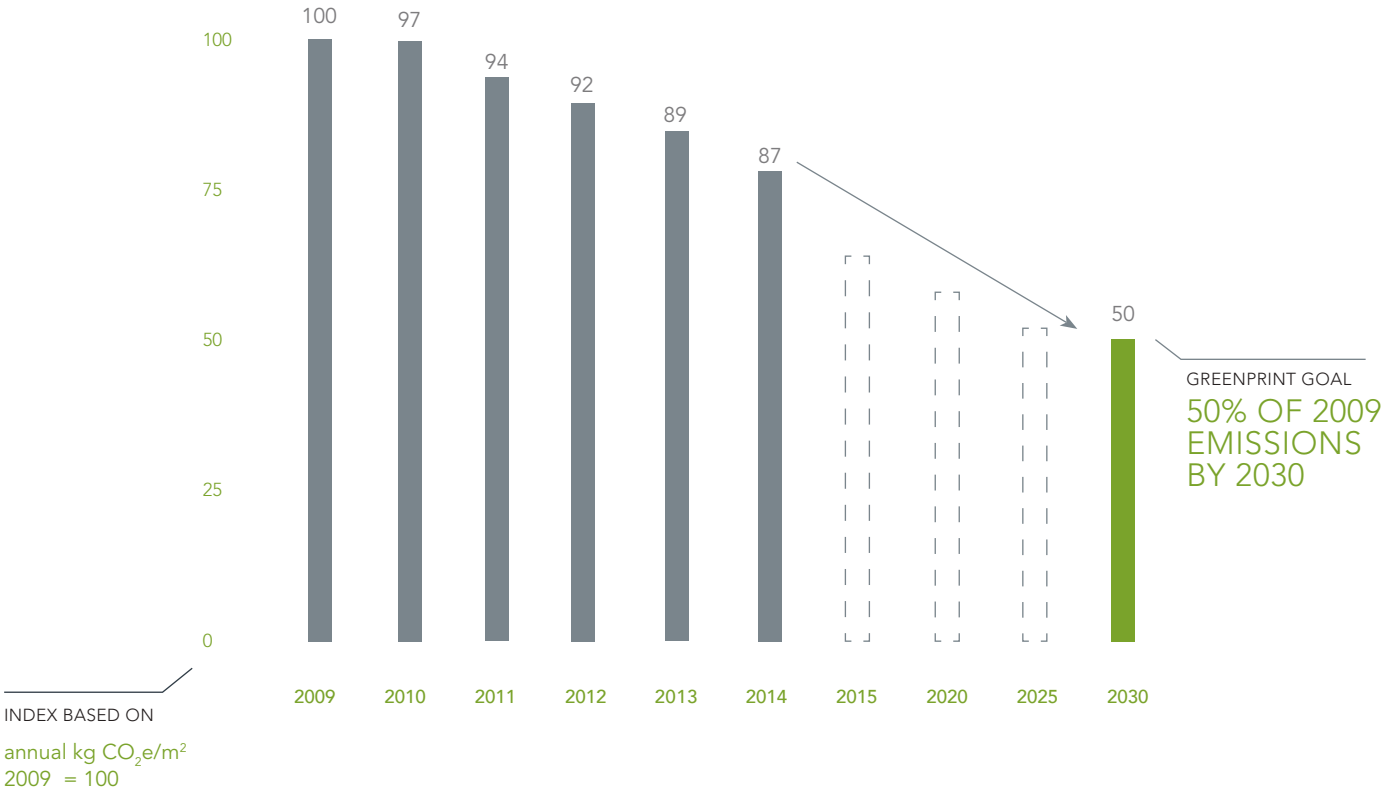
Greenprint Office Carbon Index™

YEAR OVER YEAR

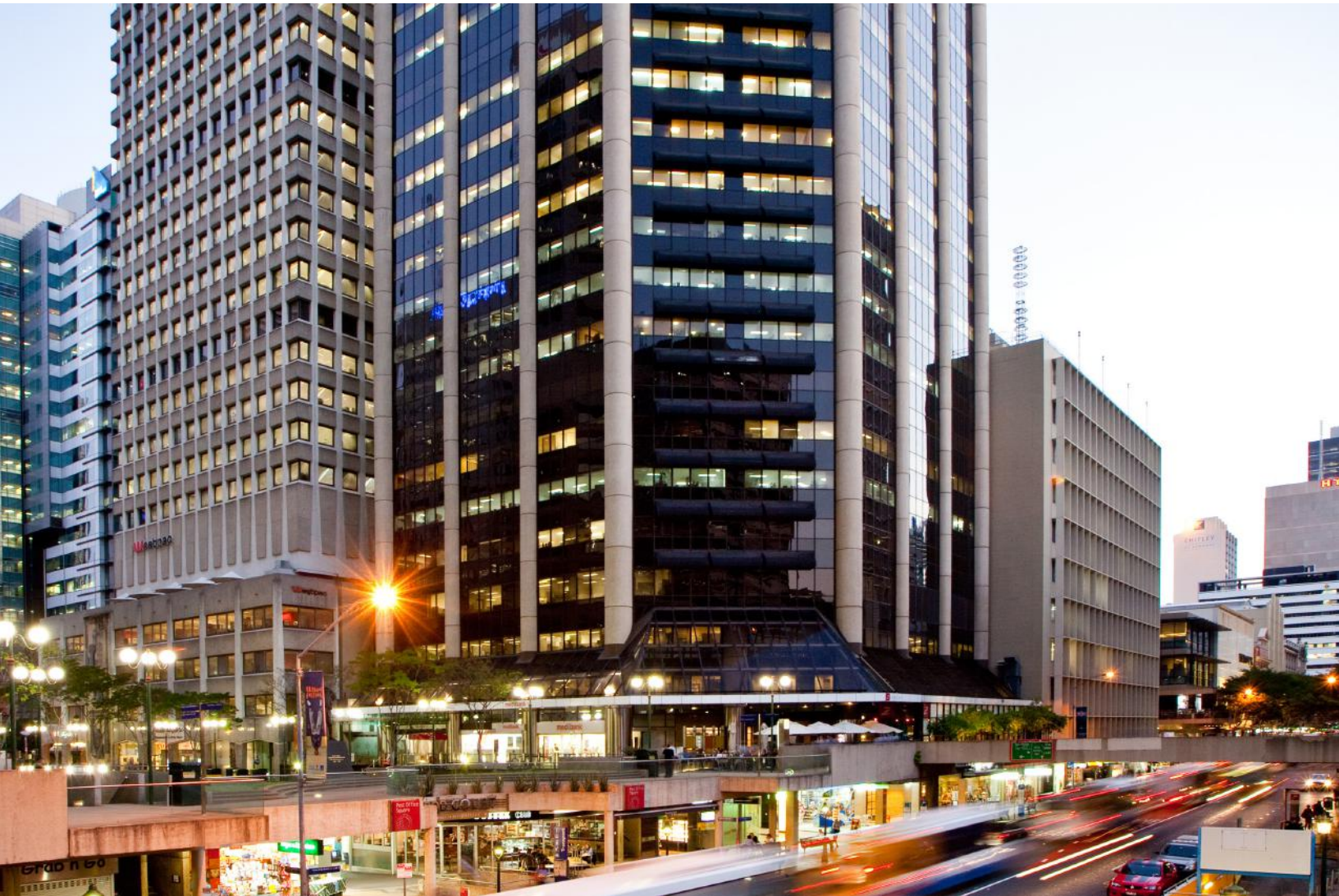
The Greenprint Office Carbon Index (GOCX) is a subset of the GCX used to measure long-term emissions performance of the Greenprint office portfolio. Similar to the GCX, the GOCX is based on the total annual greenhouse gas emissions divided by the associated total floor area for office properties. The GOCX provides real estate investors and stakeholders with a new index for research and performance measurements.

The GOCX is provided this year instead of the Greenprint Industrial Carbon Index to provide another data set that can help the industry track performance over time.

Year	Annual Emissions Intensity (kg CO_2e/m^2)	% change in emissions intensity from 2009	Annual Emissions (thousand metric tonnes of CO_2e)	Total Denominator Floor Area (m^2)	Number of Properties
2009	93.8		2,145	22.9	770
2010	91.0	-3%	2,275	25.0	884
2011	88.0	-6%	2,429	27.6	1042
2012	86.3	-8%	2,582	29.9	1172
2013	83.8	-11%	3,032	36.2	1604
2014	81.1	-13%	3,134	38.6	1800



9 APPENDIXES



Quality Controls and Verifications

Greenprint employs a data collection, verification, and calculation process aligned with the Greenhouse Gas Protocol and the principles of ISO 14064.

Greenprint employs a quality management procedure to ensure that accurate and verifiable results adhere to the following steps:

	Process Step	Role Responsible
1.	Identification of sites	Member approver
2.	Input of property data	Member respondent
3.	Data plausibility checks	Software platform
4.	Review and approval of data	Member approver
5.	Verification of data	Greenprint and software platform
6.	Calculation of GHG emissions	Software platform
7.	Verification of results	Greenprint

Data are submitted by professional managers, vetted by regional operations professionals at the member organization, and reviewed by Greenprint with assurances from owners and managers that the data are correct.

Roles

- Member approver: A senior-level employee from each Greenprint member who selects sites for inclusion in the report and provides oversight of the review process on behalf of the member firm.
- Member respondents: Property-level employees from each Greenprint member who collect property data.
- Software platform: Provided by a GRI stakeholder and CDP Accredited Provider contractor who administers the web-enabled system, manages the software plausibility checks, and performs GHG emissions calculations.
- Greenprint: Greenprint's team provides oversight of the software architecture, data collection, and results, and creates workflow process with member approvers.

Data Sources

- Property data based on the records of building landlords or their building management companies. Occupier space data are based on tenant records and lease agreements.
- Energy data based on utility bills, invoices, power-supply company records, or meter readings.
- Refrigerant data based on property maintenance logs.

Data Quality and Verification Steps

Data validation checks involve the removal of outlier data in line with the data cleansing process utilized by U.S. Department of Energy Building Performance Database. Validation checks are only performed on properties that reported whole building energy data. Any property with data outside the range below is removed from analysis.

	Minimum	Maximum
Occupancy	0%	100%
Gross Floor Area	9.3 m^2 (100 ft^2)	650,000 m^2 (7 million ft^2)
Number of Floors	1	110
Number of FTE	0	35,000
Weekly Operating Hours	0	168
Number of Guest Rooms	1	6,500
Number of Apartment Units	1	3,000
Energy Use Intensity Ranges	3.15 kWh/m^2 (1 kBtu/ft^2)	3,156 kWh/m^2 (1,000 kBtu/ft^2)

Like-for-like data was also reviewed, and properties that increased consumption by more than 100 percent or decreased consumption by more than 80 percent are not considered like-for-like. This was performed for total energy, electricity, fuel, thermal energy, and total water.

Greenprint is committed to providing its membership with the best-in-class environmental management system. We continually scan the software landscape for the most comprehensive solution. To date, we have worked closely with Credit360 to jointly create the Greenprint Environmental Management Platform, which our members use collectively.

Emissions Coefficients

Electricity Emissions Factors (kg CO_2e per kWh electricity generated)

Americas	
Argentina	0.3900
Brazil	0.0680
Canada	0.1640
Alberta	0.7390
British Columbia	0.0113
Ontario	0.0970
Quebec	0.0020
Chile	0.4410
Guatemala	0.2860
Mexico	0.4500
Panama	0.3570
United States (by eGRID subregion)	0.5618
ERCOT all	0.5547
FRCC all	0.5451
MRO West	0.7009
NPCC Long Island	0.6083
NPCC New England	0.3300
NPCC NYC/Westchester	0.2829
NPCC Upstate NY	0.2487
RFC East	0.4568
RFC Michigan	0.7431
RFC West	0.6856
SERC Midwest	0.8257
SERC Mississippi Valley	0.4688
SERC South	0.6174
SERC Tennessee Valley	0.6335
SERC Virginia/Carolina	0.4897
SPP North	0.8204
SPP South	0.7201
WECC California	0.2782
WECC Northwest	0.3842
WECC Rockies	0.8647
WECC Southwest	0.5366

EMEA	
Austria	0.2150
Belgium	0.1960
Croatia	0.2834
Czech Republic	0.5910
Egypt	0.4570
Finland	0.1910
France	0.0610
Germany	0.4770
Greece	0.7200
Hungary	0.3170
Ireland	0.4270
Italy	0.4020
Luxembourg	0.3870
Malta	0.8620
Morocco	0.7290
Netherlands	0.4040
Poland	0.7800
Portugal	0.3030
Qatar	0.4900
Romania	0.4990
Russian Federation	0.4370
Saudi Arabia	0.7540
Slovakia	0.2000
Spain	0.2910
Sweden	0.0170
Switzerland	0.0300
Turkey	0.4720
Ukraine	0.4500
United Arab Emirates	0.6000
United Kingdom	0.4410

Asia Pacific	
Australia (NGER determination)	0.8900
Australian Capital Territory	0.8800
New South Wales	0.8800
Queensland	0.8600
South Australia	0.6500
Victoria	1.1900
Bangladesh	0.5640
China	0.7640
Hong Kong	0.7680
India	0.8560
Indonesia	0.7550
Japan	0.4970
Korea, Republic of	0.5450
Macao	0.7640
Malaysia	0.6880
New Zealand	0.1410
Pakistan	0.4090
Philippines	0.4920
Singapore	0.5000
Taiwan	0.6010
Thailand	0.5220
Vietnam	0.4290

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Quality Controls and Verifications

Fuel Emissions Factors	kg CO_2e per kWh
Diesel	0.2619
Fuel oil	0.2867
LPG	0.2168
Natural gas	0.2055
Petrol	0.2504

Source

Greenhouse Gas Emissions in Portfolio Manager July 31, 2013; Figure 1 United States and Canada (Direct GHG Emissions Factors) (page 8); https://portfoliomanager.energystar.gov/pdf/reference/Emissions.pdf

UK Department for Environment, Food & Rural Affairs (Defra) – 2014 http://www.ukconversionfactorscarbonsmart.co.uk/

Notes:

Within this report, the same fuel emissions factors have been used across countries. This is in keeping with the following:

"… companies reporting on their emissions may need to include emissions resulting from overseas activities. Whilst many of the standard fuel emissions factors are likely to be similar for fuels used in other countries, grid electricity emission factors vary very considerably. It was therefore deemed useful to provide a set of overseas electricity emission factors to aid in reporting where such information is hard to source locally."

Paragraph 209, page 65: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224437/pb13988-emission-factor-methodology-130719.pdf

Thermal Energies Emissions Factors	kg CO_2e/kWh
District steam	0.2695
District cooling	0.2269
District hot water	0.2694

Source

Greenhouse Gas Emissions in Portfolio Manager July 31, 2013; Figure 3 United States and Canada (Indirect GHG Emissions Factors for all District Fuel) (page 9); https://portfoliomanager.energystar.gov/pdf/reference/Emissions.pdf

Glossary

Carbon dioxide equivalent (CO_2e)—the metric used to compare emissions from various greenhouse gases based on their global warming potential and includes carbon dioxide, methane, and nitrous oxide.

CO_2e averted as on-site renewable electricity—the amount of GHGs averted from the use of on-site renewable energy, e.g., potential sources are wind, hydroelectric, solar, and geothermal energy.

CO_2e averted as certified renewable—the amount of GHGs averted through the purchase of certified renewable electricity from power supply companies.

CO_2e emitted from on-site thermal energies—the GHGs emitted from the on-site generation of thermal heating and/or cooling.

CO_2e emitted running on-site CHP—the GHGs emitted from the operation of an on-site combined heat and power (CHP) plant producing thermal energy and electricity (for consumption both on site and exported).

CO_2e emitted from all imported fossil fuels—the GHGs emitted from the consumption of fossil fuels purchased by the landlord or tenant(s) from power supply companies.

CO_2e emitted from noncertified grid electricity—GHGs emitted from the consumption of standard grid electricity

CO_2e emitted from fugitive emissions—the GHGs emitted through intentional or unintentional refrigerant leaks and other industrial processes.

Energy use intensity (EUI)—the annual energy consumption divided by floor area.

Full-time equivalent (FTE)—the number of employees working an eight-hour interval, e.g., one employee working eight hours equals one FTE, and two employees working four hours also equals one FTE. This does not include visitors such as clients or customers, but does include subcontractors and volunteers.

ISO 14064—an International Organization for Standardization (ISO) globally recognized standard for quantification, monitoring, and reporting of sources of greenhouse gas emissions, as well as the validation of emissions data and assertions.

Like for like—a specific year-over-year analysis of the current year's properties that also have data from the previous year, with at least 350 days of data available for each year.

Median—the value lying at the midpoint of a distribution of observed values.

Normalized—a reference to adjusting values on a different scale to a common scale, such as energy intensity that is independent of the size of the building by dividing energy use by corresponding floor area.

Occupancy—the percentage of rentable floor area that is leased.

Site energy—the amount of heat and electricity consumed by a building.

Source energy—the total amount of raw fuel that is required to operate a building, including all transmission, delivery, and production losses.

Waste diversion—the prevention and reduction of generated waste through source reduction, recycling, reuse, or composting.

Property Subtype Definitions

Greenprint worked closely with its members to appropriately define property subtypes based on industry standards.

Office

Air conditioned or naturally ventilated are the only subtypes.

Industrial

Refrigerated warehouse—refrigerated buildings that are used to store perishable goods or merchandise under refrigeration at temperatures below 50 degrees Fahrenheit.

Distribution center—unrefrigerated buildings that are used for the temporary storage and redistribution of goods, manufactured products, merchandise, or raw materials.

Unrefrigerated warehouse—unrefrigerated buildings that are used to store goods, manufactured products, merchandise, or raw materials.

Self-storage—buildings that are used for private storage. Typically, a single self-storage facility will contain a variety of individual units that are rented out for the purpose of storing personal belongings.

Retail

Enclosed air-conditioned shopping center—buildings that house multiple stores, often "anchored" by one or more department stores and with interior walkways. Most stores will not have entrances accessible from outside, with the exception of the "anchor" stores. The common areas are air conditioned.

Enclosed non-air-conditioned shopping center—buildings that house multiple stores, often "anchored" by one or more department stores and with interior walkways. Most stores will not have entrances accessible from outside, with the exception of the "anchor" stores. The common areas are not air conditioned.

Retail store—individual stores used to conduct the retail sale of nonfood consumer goods such as clothing, books, toys, sporting goods, office supplies, hardware, and electronics.

Unenclosed shopping center—mixed-use commercial development that includes retail stores and leisure amenities, where individual retail stores typically contain an entrance accessible from the outside and are not connected by internal walkways. Unenclosed shopping centers have an open-air design and often include landscaped pedestrian areas, as well as streets and vehicle parking.

Lodging

Boutique—establishment that provides lodging and sometimes meals, entertainment, and various personal services for the public. It may not be part of a national chain and has fewer than 200 rooms.

Full-service—establishment that provides lodging and sometimes meals, entertainment, and various personal services for the public; usually also has room service and on-site restaurant.

Resort—establishment that provides lodging and sometimes meals, entertainment, and various personal services for the public. Usually has a large amount of land and is situated in a resort location or near a beach. Property might also have a golf course, water park, or amusement facility.

Multifamily

Garden—one- to four-story buildings that usually do not contain an elevator and have a courtyard or single family-type setting and a wide range of units.

Mid-rise—four to nine stories serviced by elevators and usually located in the inner city or dense suburbs with limited range of unit types.

High-rise—buildings with ten or more stories that sometimes have underground parking and security, with full-service and standard plan and limited unit types.

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Strategic Alliances

Partnerships and collaborations with like-minded organizations help move the ULI Greenprint Center's mission forward.

Better Buildings Partnership

The ULI Greenprint center would like to thank the Better Buildings Partnership (BBP) and its members. The BBP is a collaboration of the United Kingdom's leading commercial property owners that are working together to improve the sustainability of existing commercial building stock. This year, the BBP enhanced the Greenprint benchmark with over 400 U.K.-based properties.

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