Green Real Estate

Building a Case for Sustainable Property
‘Green is Good’ Mantra to Persist Even if Policy Shifts

MOST OF THE world’s biggest real estate managers have adopted a “green is good” attitude to their properties.

From air conditioning and bathrooms to building materials and blinds, every feature has been double and triple checked to see if they can be made more efficient or sustainable, with the goal of cutting emissions, minimizing water usage or improving the quality of life of the workers who spend time at a property.

This, of course, isn’t just an altruistic bid to better manage one of the world’s biggest contributors to global warming. Studies have repeatedly shown that investing in sustainability also generates better returns (even after a potentially higher outlay on construction), through higher rents, lower operating costs and lower vacancy rates, as their green credentials make their buildings more appealing to tenants.

“Green space is more attractive to tenants, and as demand outstrips supply, there is a disequilibrium in the market,” said Maastricht University’s Nils Kok, who is also chief economist for Netherlands-based real estate data company GeoPhy.

For example, private equity real estate firm GTIS’s LEED-certified assets in Brazil have attracted blue chip global tenants like Apple, Credit Suisse and Facebook. These global tenants offer GTIS a measure of immunity against local market volatility, GTIS executives told Bloomberg. The firm's class A portfolio in Sao Paulo had a Dec. 31 occupancy rate of 95 percent compared to 71 percent in the broader market, according to Cushman & Wakefield figures.

Despite the global enthusiasm from owners, investors and tenants for more sustainable assets, the industry now finds itself in an uncertain policy position, following the election of U.S. President Donald Trump. During last year’s election campaign, Trump pledged to roll back many of former president Barack Obama’s regulations linked to climate change, which could have implications for the U.S. and for the 2015 Paris Agreement on climate change.

However, it seems at least some in the real estate market believe that the carbon issue will not be put on the backburner for long.

“We are long term investors; carbon is something for the long term as well,” Mathieu Elshout, director of private real estate at PGGM Investments, told Bloomberg. While things have changed, “the carbon issue is not gone. We are still on the same path,” he said.

In the U.S., Fannie Mae is also betting on continued enthusiasm for – and strong returns from – sustainable real estate. It has been focusing more on creating portfolios of green loans for multifamily housing that meet green building certifications. The guarantor said it increased its underwriting of multifamily green loans that meet LEED, Energy Star or Green Globes certifications more than ten-fold last year to over $3.6 billion.

“We think in the long run it will broaden our investor base,” said Jeff Hayward, head of multifamily at Fannie Mae, in an interview.

For anyone with an interest in real estate or sustainability, this report will give insights about how the asset class has performed and is expected to perform in an era of uncertainty about climate change policy.

Ainslie Chandler,
Bloomberg Reports Editor
Fannie Mae increased its underwriting of multifamily green loans more than tenfold last year to more than $3.6 billion.

The loans, on buildings that have LEED (Leadership in Energy and Environmental Design), Energy Star or Green Globes certifications, are an outgrowth of Fannie Mae’s recent efforts to encourage landlords to improve sustainability to reduce their operating costs.

“There is a fundamental economic reason behind this,” said Jeff Hayward, head of multifamily at Fannie Mae in an interview. “In an environment where rents might not be growing at the same pace as historically and you’re looking for ways to cut expenses, if a landlord can cut down on its water and energy and utility line, it flows right to the bottom line.”

In 2011, Fannie Mae began studying trends among landlords who had green buildings certifications, Hayward said.

“The owners who were better at running their buildings just so happened to also care about being green,” he said. “Office and retail buildings have been focusing on this for a long time – in some ways multifamily was late to the party. But there will be a day when every owner does this because it makes common sense.”

Hayward said the firm has noted lower default risks on properties with green certifications, and smaller losses in the case of defaults. In many cases, Fannie Mae has paid for energy audits of buildings it guarantees to help landlords figure out how to reduce energy costs – discounting guarantees for green buildings by 10 to 20 basis points, he said.

The benefits of green buildings can also trickle down to low-income residents in affordable multifamily housing projects, to the extent that landlords don’t need to raise rents, Hayward said.

Fannie Mae is also bringing its focus on green buildings to mortgage-backed securities, which it’s marketing to a broad group of green investors.

“We think in the long run it will broaden our investor base,” Hayward said.

“The returns on the green MBS are the same as the returns on everything we do,” he added.

Fannie Mae said Feb. 15 that it priced its first green real estate mortgage investment conduit (REMIC) tranches as part of a $1 billion multifamily loan.
Green Buildings
Key to Attracting Global Tenants in Emerging Markets: GTIS’s Pristaw

Ainslie Chandler interviewed Josh Pristaw and João Teixeira, senior managing directors of GTIS Partners, on Feb. 15. Their comments have been edited and condensed for clarity.

GTIS is a private equity real estate investor. Pristaw and Teixeira head the firm’s Brazil operations.

A focus on energy efficiency means higher upfront costs but better long-term returns, according to Teixeira.

Q: Why the focus on sustainability?
Josh Pristaw: In addition to being a good corporate and global citizen, it’s been a competitive advantage for us. One, it’s really important in attracting global multinational institutions as our tenants. We have developed, from the ground up, five buildings that are LEED certified. That was a key component in our leasing efforts for the past 10 years.

Two, we manage capital for global investors. As investors have become more conscious and focused on sustainability, in partnering with them, we have absorbed and implemented a lot of their initiatives, and met their requirements, and brought them to Brazil.

Three, we think it makes financial sense. We own some land and hotels and we partnered with a renewable energy firm that put up the capital to build wind farms on some of our land. We are about to close a transaction to acquire power from them that would basically power 10 percent of our owned hotel portfolio. We are reducing our energy costs and we are making a big difference from a sustainability standpoint. And we are buying the energy back at a price that is less than we would pay a distribution company.

Q: Are your limited partners showing more interest in sustainability?
JP: Across the board we see increased interest from our tenants and our limited partners and all of our stakeholders. One of our focuses for the past year has been stakeholder engagement. We have implemented things like tenant surveys, employee surveys. We have a renewed focus with our construction companies, where we look at how our construction is impacting the community. There’s definitely a growing focus on it. That has stimulated our efforts to implement it.

Q: What does it do for returns?
JP: We generally think we are getting better returns because we are getting better quality tenants with better credit. We have tenants like Facebook, Apple, Credit Suisse and Goldman Sachs. The reality is, if you can deliver a product that is in the right location that meets the objectives of those clients, that is a scarce asset for an emerging market like Brazil. People will pay a premium for it and when we go to sell it, it will trade at a premium price.

We also generate better returns by looking to reduce our operating costs. We look at things like the systems that we are investing in and we are looking at reducing the operating costs and the consumption of energy and the efficiency of things. Oftentimes, the sustainable solution is aligned with the economic solution.

Q: What has the uncertainty in Brazil in recent years changed any attitudes towards sustainability? Is it still front of mind?
JP: The tenants that we strive for and have generally been successful leasing to tend to have global standards that they can’t ignore. We actually think that that’s another reason why in a really challenging economic climate in Brazil, with difficult real estate fundamentals, we have been able to outperform the market because our buildings are sustainable. We like to build or invest in buildings that a tenant would occupy in any market in the world. It’s not just good for Brazil, it meets their global standards.

Q: Do you think the vacancy rate in your portfolio is lower because of your sustainability focus?
JP: In the challenging economic environment in Brazil, a lot of the leasing in the market has been from the bigger multinational companies that are well capitalized and view their business in Brazil as a long-term endeavor and are migrating from older, inefficient, substandard buildings to new class A buildings. If you have well located, sustainable, high quality buildings, you have outperformed the market materially in the past few years.
INVESTORS STILL SEE climate policy as a risk for the real estate sector, even as the election of U.S. President Donald Trump raises questions on whether curbing the rise of global temperatures will stay on the agenda.

PGGM, the second-largest Dutch pension fund manager, said it is sticking to its goal of lowering the carbon footprint of real estate funds it manages by 50 percent before 2020, compared with a 2015 baseline.

The idea is to get out ahead of any possible carbon pricing or taxes that may be imposed on the sector – a view PGGM still holds despite any changes in political sentiment on the issue.

“We are long term investors; carbon is something for the long term as well,” Mathieu Elshout, director of private real estate at PGGM Investments, said in an interview on Feb. 17. Around 11 percent of PGGM’s more than 200 billion euros ($212 billion) in assets under management is in the real estate sector, equally divided across public and private assets.

Elshout said things may change “overnight” in the political world, but “the carbon issue is not gone. We are still on the same path.”

While campaigning for president, Trump said last year that he would roll back many of former president Barack Obama’s regulations linked to climate change. Climate activists are waiting to see what this will mean for the 2015 Paris Agreement. The accord, which was forged in Paris and came in force in November, brings together the U.S., China and more than 190 other nations into a United Nations-sponsored plan to cut the emissions that trap heat in the Earth’s atmosphere.

Apartment blocks, shopping malls and offices aren’t often branded as major climate change contributors. Yet, the heating, air conditioning, lighting and electrical equipment thrumming inside buildings every day make them energy hungry and – in many cases – emissions intensive.

Buildings accounted for 32 percent of final global energy use and 19 percent of energy-related greenhouse gas emissions in 2010, according to the Intergovernmental Panel on Climate Change’s latest global warming assessment report, published in 2014. The reports, which are released every several years, serve as the scientific basis for international climate negotiations. The panel says buildings’ energy use, and related emissions, may double or even triple by the middle of the century as global standards of living improve and the world population increases.

In an interview last June, PGGM’s Elshout indicated the effort to reduce emissions in the property sector will have value beyond short term financial results.

“Our pension is worth more in the future in a liveable world than in a non-sustainable world,” he said.

Eighty-Eight Climate Pledges Included Efficiency or Building Commitments

- No known NDC
- NDC
- NDC with energy efficiency or building commitment
- NDC with energy efficiency and building commitment

Source: Global Alliance for Building and Construction; Note: Nationally determined contributions (NDCs) are pledges made by countries as part of the Paris climate agreement
Northern Trust Says Institutional Clients Are Demanding ESG REITs

By AINSLIE CHANDLER

NORTHERN TRUST ASSET
Management has created a new ESG-focused global REIT index and a passive fund to invest in it, responding to increasing investor demand for sustainable real estate investments.

The Chicago-based firm, which had about $55 billion in assets under management for ESG strategies and $942 billion under management overall at Dec. 31, partnered with Global Real Estate Sustainability Benchmark (GRESB) to develop the Northern Trust Developed Real Estate GRESB Custom ESG Index.

A Netherlands-domiciled passive fund to invest the index is in the final stages of planning, with a cohort of investors ready to back the fund, Mamadou-Abou Sarr, global head of ESG investing at Northern Trust Asset Management said in an interview.

REITs remain a staple of most institutional investors’ portfolios, Sarr said.

Demand for green REIT investments is coming from Northern Trust’s institutional clients, which include pension funds, endowments and sovereign wealth funds, and also networks of retail investors, Sarr said. Demand is particularly strong in Europe, he said.

“When you think about REITs allocation, we’ve seen a constant allocation from pensions around the world. In Europe, for example, between 70 to 80 percent of pension funds will have a REITs allocation in their portfolios,” he said.

The REITs in the index are ranked by GRESB using an annual survey that assesses 40 indicators, in categories including water and energy use, waste management, health and safety and corruption.

The index is currently about 50 percent allocated to U.S. REITs, 12 percent to Japan REITs and 10 percent to Australian REITs, according to Northern Trust.

Aside from helping institutions meet their ESG goals, returns could also be improved by investing in REITs with an ESG focus, as measured by GRESB, Sarr said, pointing to a 2015 University of Cambridge study. The study showed that investing in sustainability improved operational performance and lowered risk exposure and volatility.


“Both the returns on assets and returns on equity of REITs with high GRESB scores appear to outperform the rest of their cohort,” Fuerst wrote in the report, noting that there is significant room for improvement in the sustainability performance of the REITs.

“You have a lot of ESG issues that are impacting the performance of REITs,” Sarr said.

50%

Weighting of U.S. REITs in the Northern Trust Developed Real Estate GRESB Custom ESG Index

Biggest Holdings in Northern Trust/GRESB ESG REIT Index

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<tr>
<th>Stock</th>
<th>Weighting (%)</th>
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<tr>
<td>Simon Property Group</td>
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<tr>
<td>Prologis Inc.</td>
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<td>Unibail-Rodamco</td>
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<tr>
<td>Sun Hung Kai Properties</td>
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<td>Equinix Inc.</td>
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<td>Welltower Inc.</td>
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<td>Vornado Realty Trust</td>
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<td>Ventas Inc.</td>
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<td>Scentre Group</td>
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Index Weighting by Country

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<td>Australia</td>
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<td>France</td>
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<td>U.K.</td>
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<td>Singapore</td>
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Source: Northern Trust Asset Management
Green Ratings Have Been a Consistent Boost for Office Rents, Study Shows

By SIOBHAN WAGNER

A new research report on the financial benefits of owning sustainable office space in the U.S. backs up a host of other studies that make the business case for green buildings, and also finds the premium environmentally friendly properties command may depend on the type of certification.

Environmentally certified buildings in the U.S. are being leased at higher prices, compared with non-green properties, according to a recent academic paper that has tracked the market over 10 years.

Office buildings that are rated by the U.S. Environmental Protection Agency’s Energy Star program lease for 1.5 percent more than non-rated properties, based on average rent, researchers Rogier Holtermans of the University of Southern California and Nils Kok of Maastricht University in the Netherlands wrote in the report.

The premium for office buildings that are certified by the U.S. Green Building Council’s LEED program, short for Leadership in Energy & Environmental Design, is slightly higher at 2.3 percent, based on average rent, the report said.

“Green space is more attractive to tenants, and as demand outstrips supply, there is a disequilibrium in the market,” said Kok, who is also chief economist for Netherlands-based real estate data company GeoPhy.

LEED properties are rarer than Energy Star buildings. Energy Star represented 9.6 percent of commercial office buildings in the 30 largest U.S. markets during 2015, while LEED only accounted for 4.7 percent, according to the Green Building Adoption Index 2016, which was developed by Maastricht University and CBRE Group Inc.

Kok said tenants may prefer green buildings because their corporate leasing requirements prescribe LEED-certified space or companies may expect lower running costs from a more efficient building.

In addition to higher rents, the researchers documented better occupancy rates with green buildings over time. “The occupancy rate for non-certified buildings is on average seven percent lower than for certified buildings,” the report said. “However, in contrast to the trend we observe in the total net asking rent, this difference is slightly decreasing over time. While the average difference in occupancy rate in 2004 is more than seven percent, this is reduced to less than five percent in 2013.”

The study used a dataset of 25,690 U.S. commercial office buildings and recorded the quarterly rent growth and volatility of environmentally certified and non-certified buildings from the start of 2004 to the third quarter of 2013.

### Occupancy Rates Are Higher for Greener U.S. Offices

<table>
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<tr>
<th>Occupancy Rates (Percentage)</th>
<th>2004</th>
<th>3Q/2013</th>
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<tbody>
<tr>
<td>Certified</td>
<td>90%</td>
<td>85%</td>
</tr>
<tr>
<td>Non-Certified</td>
<td>80%</td>
<td>75%</td>
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Source: Rogier Holtermans, University of Southern California, and Nils Kok, Maastricht University
Who Generates Least Amount of CO2 Per Rent Dollar?

GeoPhy Ranks Top 3 REITs by Region

Kilogram of Co2 equivalent per dollar of rent revenue

higher revenue,” Nils Kok, the chief economist for GeoPhy, said by e-mail, “so that can explain a lower carbon intensity (carbon/rent) for otherwise similar property companies, in the same region and property type.”

Kok said the location of a property can play a major role in its carbon footprint. “Carbon emissions are also based on the carbon intensity of the local grid — that will have a profound effect over the next decade, as grids will start to ‘green’ with coal plants retiring and utility-scale renewables coming online,” he said.

Kok said one of the standout companies for him on the list was Unibail-Rodamco SE. “I like a company such as Unibail,” he said. The company’s

RESEARCH

Property Location, Age Are Major Factors in a REIT’s Carbon Footprint, GeoPhy Says

By SIOBHAN WAGNER

REAL ESTATE INVESTMENT trusts that own newer buildings located in areas with access to renewable energy have relatively low carbon footprints, according to analysis by GeoPhy.

The Netherlands-based real estate data firm says investors are beginning to consider the sustainability of their property portfolios as studies show energy-efficient buildings also make good investments.

But how do you determine the relative carbon impact of a real-estate portfolio, which could include properties as diverse as low-energy (and low-earning) warehouses and energy-guzzling data centers?

GeoPhy does it by directly comparing how much carbon a property produces per dollar of rent revenue it generates. GeoPhy calculated the carbon footprint of 50 of the largest REITs by market cap in its database of 900 listed companies in the sector worldwide, exclusively for Bloomberg. This follows a previous ranking GeoPhy compiled for Bloomberg last year, with new figures on rental income from year-end 2016.

“Better managed, more efficient, green buildings typically generate a higher revenue.” Nils Kok, chief economist for GeoPhy

How much carbon is produced by Mitsubishi Estate’s property portfolio for every dollar of rent revenue. The REIT had the lowest footprint in the APAC region.

properties get power from grids with “relatively low carbon intensity,” and it’s “also very actively pursuing energy efficiency opportunities, while at the same time this is a financially (very) successful property company.”

Who Generates Least Amount of CO2 Per Rent Dollar?

GeoPhy Ranks Top 3 REITs by Region

Kilogram of Co2 equivalent per dollar of rent revenue

<table>
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<tr>
<th>Americas</th>
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<td>SL Green Realty</td>
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<td>Mitsubishi Estate</td>
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<td>Scentre Group</td>
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<td>Goodman Group</td>
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Source: GeoPhy

“Better managed, more efficient, green buildings typically generate a higher revenue.”

— Nils Kok, chief economist for GeoPhy
Nearly two dozen New York City big commercial real estate owners and tenants have enlisted in a program to cut the greenhouse gas emissions of buildings that its boosters hope other cities can emulate.

But President Donald Trump’s company isn’t among them.

The new participants in the New York City Carbon Challenge add 58 million square feet of commercial space to the program, with a projected $50 million in energy savings, Mayor Bill de Blasio said Jan 26. The program calls for voluntary steps to reduce carbon emissions by 30 percent or more in 10 years.

The Carbon Challenge, which began in 2007 under the administration of Mayor Michael R. Bloomberg, now includes 17 universities, 10 hospital organizations, 24 commercial tenants, 10 commercial owners, 20 residential property management companies and 18 hotels—with a total exceeding 325 million square feet, or 6 percent of citywide built square footage.

The former mayor, who left office at the end of 2013, is the founder and majority owner of Bloomberg News parent Bloomberg LP, which was among the first companies to join the program.

Participants have averaged 20 percent in reductions, with 10 having already fully met their goals, the city said. The total aggregate reduction so far is 340,000 metric tons, saving more than $150 million in energy costs, the city said.

The program is part of a city effort to reduce greenhouse emissions by 80 percent by 2050 from 2005 levels.

“The commitments from these 22 commercial owners and tenants show environmental sustainability and economic sustainability work hand in hand,” de Blasio said in a statement.

Backed by Industry Group

With the backing of the Real Estate Board of New York industry association, the newly participating major property owners are The Durst Organization, Forest City, Normandy Real Estate Partners, Related Companies, Rockefeller Group, Rudin Management Co. Inc., RXR Realty, SL Green Realty Corp., Silverstein Properties Inc. and Vornado Realty Trust. Newly added commercial tenants and owner-occupiers include the law firms Allen & Overy LLP, Stroock LLP and White & Case LLP; banks Barclays, Citi and UBS; companies Barnes & Noble, Pfizer Inc., Sumitomo Corp. and Viacom Inc.; and the advocacy groups Environmental Defense Fund and Natural Resources Defense Council.

Statements of support by business leaders and environmental advocates endorsing the city program pointed to the leadership role of cities and the private sector in reducing carbon emissions.

Alluding to changes in federal climate policy expected with the Trump administration, EDF President Fred Krupp called the city program “a shining example” at a critical time for cities and states to “take the lead in protecting the environment.”

Absent from the roster were city properties held by the Trump Organization Inc., although a former Trump property, the Grand Hyatt Hotel, participates in the program. A city table compiling 2014 energy and water use in a Buildings Department conservation benchmarking program shows leading Trump properties to be among the lower ranks of large city buildings, based on their Energy Star efficiency rating. The data reporting is required under a local law adopted in 2009 (No. 84).

Trump Soho Hotel Condominium was at the bottom of the most recent list, with an Energy Star rating of 1. That means its rating was on par with the worst 1 percent of its peers.

By contrast, the Trump Building, a 71-story 1930 office tower at 40 Wall Street, had a high 91 Energy Star rating.

But most properties listed on the Trump Organization website were squarely in the bottom half of the Energy Star scale, with the Trump Park Avenue apartment building getting a 6 and the Trump International Hotel and Tower at 1 Central Park West getting an 8.

The Trump Tower at 721 Fifth Avenue, where the president keeps his New York residence, had an Energy Star rating of 46.

Representatives of the Trump Organization didn’t respond to a March 7 e-mail request for comment on the company’s view of the city program, its Energy Star ratings or its energy efficiency policies.

The original version of this story ran on Jan. 26.
Massachusetts was the U.S. state with the highest level of LEED-certified property per capita in 2016, according to the U.S. Green Building Council. The state, whose LEED-certified assets include the Boston Convention and Exhibition Center, has 136 certified projects, resulting in 3.73 square feet of certified space per resident. Massachusetts jumped from third position in 2015, when it averaged 3.03 sqf per capita.

However, Washington D.C., which was not officially ranked because it is not a state, outpaced the competition by a large measure in 2016 with 29.04 sqf per capita in its 120 projects.
Sustainability has become a concern across the real estate sector. Owners and occupiers of properties ranging from casinos to warehouses tell Bloomberg Reports they are committing time and capital to greening their assets and the buildings they occupy. Comments have been edited and condensed for clarity.

**Gwen Migita, VP sustainability & corporate citizenship, at Caesars Entertainment Corp.**

“We continue to do retrofits at an aggressive level — that’s literally millions of light bulbs, sensors, thermostats and remodels. There’s a lot more smart technology around continuous leak monitoring that we’ve been on a three-year roll out. If you can see or call out a specific issue ranging from leaks to heating and cooling, complaints about a room being too cool or too hot, out of 3,000 rooms in a hotel, we can detect patterns and look if there’s an issue on the floor.

We are also focusing on behavior changing programs, with external certifications in employee training through “Green Key,” managing sheet replacement costs, soap and shampoo collections. We try to find ways for it to matter for individual employees and keep them engaged. It has to matter for the individual employee on green buildings. He or she has got 30 other things to care about and we don’t want to pile on, we want it to be a positive engagement.”

**Christophe Cuvillier, chairman & chief executive officer, Unibail-Rodamco, on the company’s Feb. 1 earnings call**

“We’ve introduced our new corporate social responsibility initiative called Better Places 2030. This initiative addresses the main challenges facing commercial real estate for the next 15 years: moving toward a low carbon economy, anticipating new modes of sustainable mobility and fully integrating our business activities within the local communities. Better Places 2030 sets to reduce by no less than minus 50 percent the carbon footprint of Unibail-Rodamco’s building by 2030. We aim to reduce by 35 percent the carbon footprint of the construction of new development projects, and to reduce by 70 percent the carbon footprint of our operations. We also target to reduce by minus 50 percent the group’s annual carbon footprint from transport.”

**Jeannie Renne-Malone, vice president of sustainability, Prologis, Inc., in a Feb. 7 NAREIT interview on Reit.com**

“We’ve already done so much to address the low-hanging fruit. We need to now be looking at the next innovative technologies and initiatives that will continue to move the needle. Specifically, we need to think about where we’ll be in 10, 20 years — what will the industry look like in respect to water, waste, energy, transportation and what kind of technologies are going to help us get to that point. In addition, we really need to be thinking about resiliency from an economic, environmental and human capital perspective and understand what kind of design specifications we’ll be needing to think about, along with the needs of our communities and our employees.”

**Albert P. Behler, chairman, president and CEO, Paramount Group Inc., on the company’s Feb. 23 earnings call**

“We also made tremendous progress on the sustainability front where we recently announced that each building in our portfolio has achieved either a Gold or Platinum LEED Certification. To our knowledge, we are the only public real estate portfolio to have this distinction and we are very proud of that. This achievement is a testament to the quality of our assets and brings tangible benefits in our efforts to attract high quality tenants while helping lower operating costs.”

**Tamara Barker, UPS chief sustainability officer and vice president of environmental affairs**

“While it may seem like insignificant activities these days, given the variety of green building programs and areas of focus, lighting is still a big area where we can gain efficiencies and build a more sustainable footprint within our facilities. We’ve identified 100 of our highest energy usage facilities in the U.S. and began a focused effort in 2014 to upgrade these facilities to LED lights. We built on that in 2015 by adding an additional 100 facilities. We expect to save more than 32 million kilowatt-hours per year when these upgrades are completed.”
## Green Buildings: Key Figures and Stats

**Compiled by Siobhan Wagner**

| **122** | The amount of exajoules the global building sector consumed in 2014. This was over 30 percent of total final energy consumption for all sectors of the economy, according to figures reported in the Global Alliance for Building and Construction's Global Status Report 2016. |
| **50%** | The potential increase in energy demand from buildings by 2050 as population grows and purchasing power in emerging economies and developing countries increases, according to the GABC report. This assumes no action is taken to increase energy performance. |
| **62** | The number of countries with both mandatory and voluntary building energy codes. Building energy codes and standards are regulations that set minimum requirements for energy efficiency and/or use of resources in buildings.* |

| **388** | How many billions of dollars spent on energy-efficient products and services globally in 2015. The "building envelope," primarily with insulation and windows, accounted for the largest share of investments in building energy efficiency at $237 billion.* |
| **48.5** | How many billions of dollars Western Europe alone spent on energy efficiency investment in 2015 — making it a leader among world regions. North America was second with $31.2 billion, followed by China with $22.7 billion.* |
| **6%** | The share of global residential energy consumption that could have been saved globally in 2015 had average standards been implemented across all countries for space cooling, space heating, water heating and lighting.* |

| **19.6%** | By square footage, the total floor space LEED certified by the U.S. Green Building Council in 2015, according to the Green Building Adoption Index 2016, which looked at the 30 largest office markets in the U.S. This was a decrease from 20.1 percent in 2014.** |
| **12.4%** | The share of U.S. commercial building stock that had an Energy Star label, LEED certification, or both, at the end of 2015, compared with 12.1 percent at the end of 2014, according to the Green Building Adoption Index.** |
| **10x** | The potential increase in energy demand from space cooling by 2050 in some warm-climate, rapidly emerging economies. Space cooling is the fastest-growing end use in buildings.* |

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