ROBECO
The Investment Engineers

Robeco Sustainable Property Equities

The decarbonization of property is accelerating

Sustainable Investing Expertise by ROBECOSAM

- The top 200 largest listed real estate companies decreased carbon emissions by 4.7% in 2021, but cross-sector variance is significant.
- Real estate companies improved carbon emissions disclosure and target setting in 2021, particularly with regards to scope 3 emissions.
- Future regulations are anticipated to focus not only on overall carbon emissions, but also energy intensity of individual assets.

Decarbonization in real estate is a race against time. Governments have set the path for reduced emissions, with the goal of transitioning to a low-carbon or even carbon-neutral future. The property sector plays a significant role in this decarbonization journey, as it accounts for approximately 40% of annual global greenhouse gas (GHG) emissions, according to the International Energy Agency (IEA). The sector is making big strides toward decarbonization, but are we close to where we need to be?

In this report, we investigate whether, to what extent, and how real estate companies report their environmental performance and targets, as disclosure is the very first step in the pursuit of carbon mitigation goals. We analyze data from companies invested in the Robeco Sustainable Property strategy and the top 200 largest listed real estate companies. For the first time, our analysis encompasses a wider range of

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metrics, now including scope 3 target setting, embodied carbon, and green leases, as more companies have started disclosing information on these topics.

Scope 3 progress

It is reassuring to see that in 2021, real estate companies in our sample, which account for 87% of the weight in the S&P Global Developed Property Index, and around 1.9 trillion USD in terms of market cap, have improving GHG emissions disclosure and targets, especially for scope 3. The following table summarizes the number of companies in our sample that report on, set targets for, and use tools to manage GHG emissions.

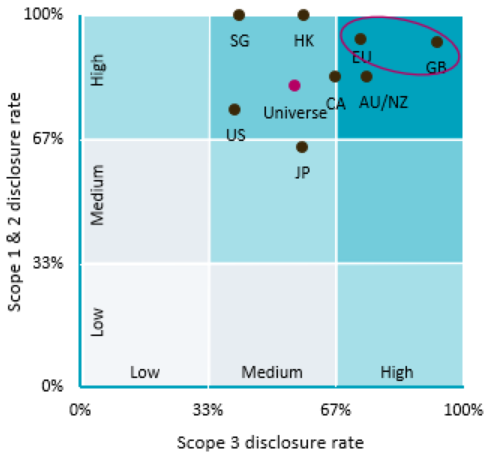
Table 1 | Disclosure of environmental performance, targets, and use of tools to manage GHG emissions

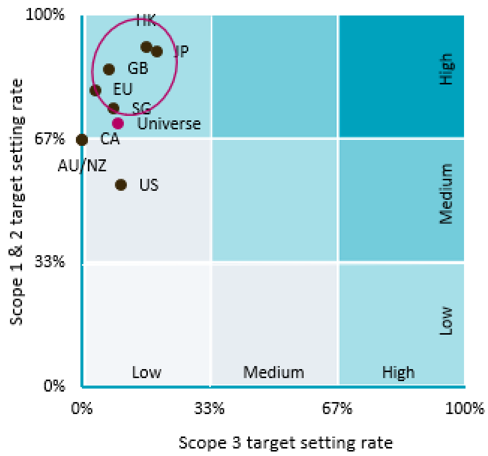
		Scope 1 & 2		Scope 3		Embodied carbon		Green lease
		Reporting	Targets setting	Reporting	Targets setting	Reporting	Targets setting	In place/plan to
2021	# Companies	160	140	111	19	4	9	98
	% Benchmark weight	84%	69%	62%	21%	3%	4%	48%
2020	# Companies	156	139	72	N/A	N/A	N/A	N/A

Source: Corporate reports, Robeco.

160 companies, representing 84% of benchmark weight, disclosed their scope 1 & 2 emissions, and 111 companies, representing 62% of benchmark weight, disclosed scope 3 emissions. Geographically, the UK and the EU are ahead in these regards, while the US falls behind by contrast (Figure 1).

Figure 1 | Carbon disclosure and targets by geography





Source: Corporate reports, Robeco.

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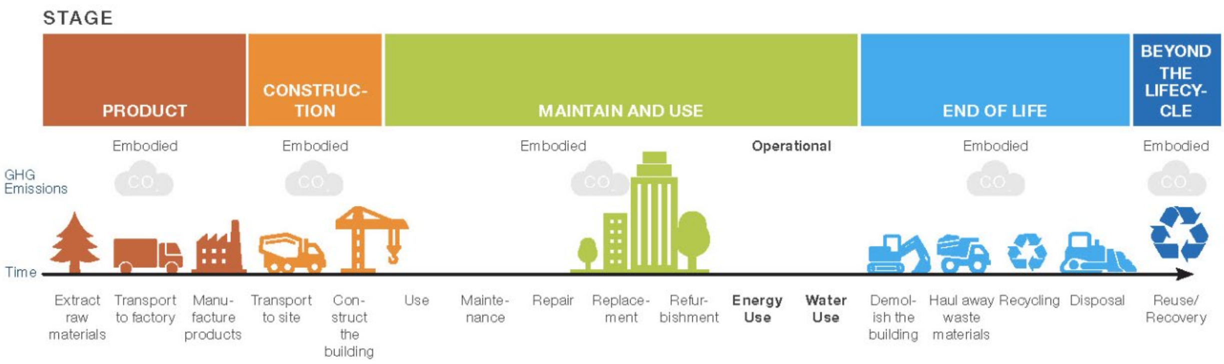
Box 1: Embodied carbon versus operational carbon

In the property sector, embodied carbon refers to the carbon emissions associated with the production and transportation of building materials and components, as well as the construction of a building, end-of-life, and refurbishments. Operational carbon refers to the carbon emissions associated with the day-to-day energy use of a building, such as heating, cooling, and lighting.

Figure 2 | Building life cycle and associated types of carbon emissions



Source: New Buildings Institute.

In terms of operational carbon, 98 companies (48% of benchmark weight) reported using or considering the use of green leases to reduce their operational carbon. However, when it comes to embodied carbon, only a small percentage of companies have disclosed (3% of benchmark weight) and set targets (4% of benchmark weight) for it. This aligns with our previous research[1] that operational carbon emissions remain the priority of the property sector for now, as they constitute a large portion of total emissions and are relatively easier to tackle. Also efforts to reduce operational carbon can directly impact operating costs, with regulations thus far primarily focusing on this area. When it comes to addressing embodied carbon, the industry remains at a much earlier stage. While tools are available to better quantify embodied carbon, they still need to be developed further.

Based on the environmental performance and Scope 1 & 2 emissions reduction targets of the companies, we project the decarbonization pathway of the benchmark and Robeco Sustainable Property strategy for the coming years. It is worth noting that we use scope 1 and 2 emissions as a proxy for operational carbon. Tenants' emissions sometimes can fall under scope 3 depending on their metering/sub-metering arrangements. The metric we use to track the emissions of companies is weighted carbon intensity based on EVIC, as illustrated by the formula below[2]:

$$\sum_{i}^{n} (Investment\ Weight_i) \times \frac{Emissions\ Scope\ 1\ and\ Scope\ 2_i}{EVIC_i}$$

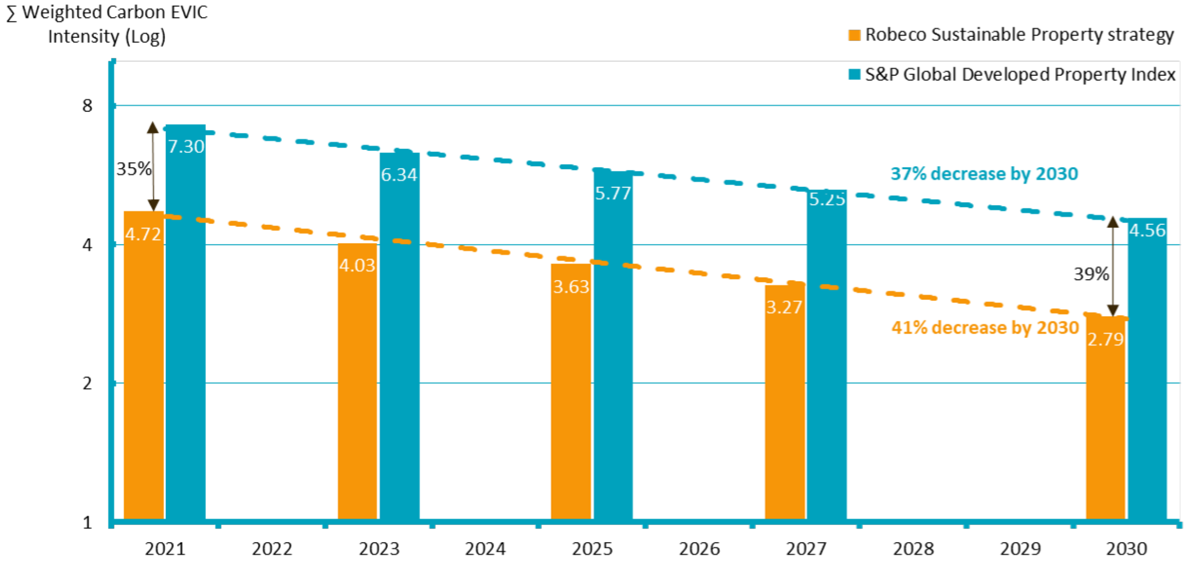
Where:
i = companies in the S&P Development Property Index
Investment weight = individual stock weight in the S&P Developed Property Index
EVIC = enterprise value including cash
Scope 1 & 2 emissions = GHG emissions in metric tons, as reported by each individual company.

Figure 3 presents the decarbonization pathways for the S&P Developed Property Index and for the Robeco Sustainable Property strategy. The weighted average carbon intensity is measured in tCO2e/mn USD.

[1] See Robeco white paper, The Financial Risk of Carbon Footprint in the Real Estate Sector for more information.

As shown in Figure 3, in 2021, the strategy's holdings had a 35% lower weighted carbon intensity (4.72) than the S&P Developed Property Index (7.30), demonstrating that the strategy is already better positioned for decarbonization. In 2030, the strategy's holdings are expected to decrease their carbon intensity even further, reaching 2.79, compared to 4.56 for the index. Taking into account the lower starting point, calculated from the benchmark level, the strategy's average annualized reduction rate is 9.2%, in contrast to 4.6% for the index. It is important to bear in mind that, according to the UN Environment Programme, to achieve the targets set in the Paris Agreement, emissions must fall by 7.6% per year between 2020 and 2030[3]. While the strategy's holdings are more in line with the Paris Agreement, and seem better prepared for future regulations, the overall reduction of emissions in the property sector has to accelerate to fully meet the demands of this pressing issue.

Figure 3 | Decarbonization pathways for the S&P Developed Property Index and Sustainable Property strategy[4]



Source: Trucost, Corporate reports, Robeco.

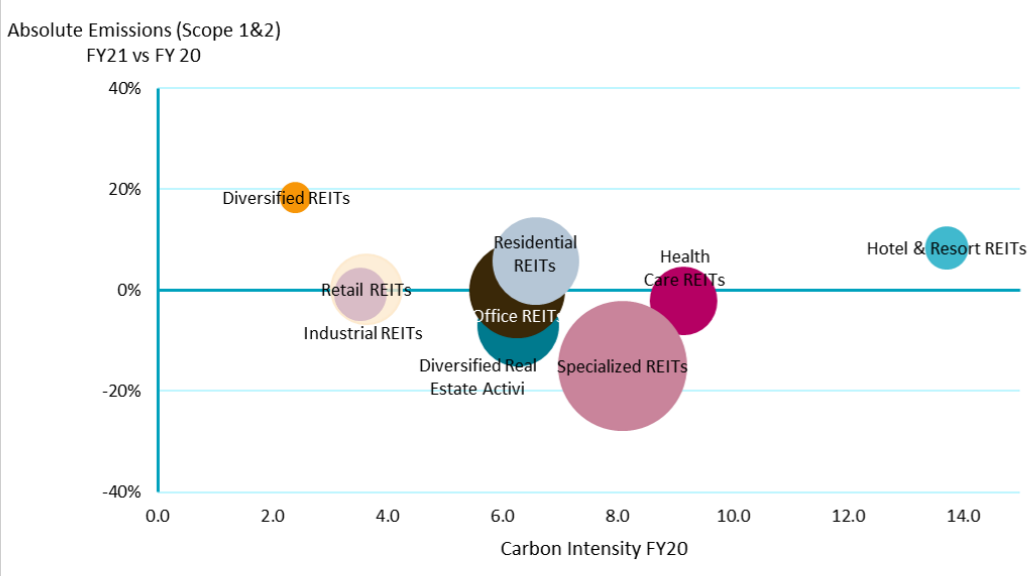
[3] UN Environment Programme (2019), Emissions Gap Report 2019.
[4] A few assumptions are made in our calculation for the sake of comparability:
Assumption 1: If the emission targets disclosed in corporate reports are on an absolute amount basis rather than an intensity basis, it is assumed that the total floor area of the companies remains the same and the targets are treated as intensity targets.
Assumption 2: The base year and target year are uniformly set as 2021 and 2030 respectively for all companies. If a company has a target year close enough to 2030 (≤5 years), then that target is used as the 2030 target. Otherwise, the 2030 target is extrapolated by using the annual reduction rate.
Assumption 3: Carbon targets are only obtained for the companies in our sample, representing 84% of the weight in the S&P Developed Property Index, while the remaining 16% companies in the benchmark are treated to be decarbonizing in line with the rest of the sample. It is a conservative assumption, as smaller companies are generally at the very beginning of their decarbonization journey or have not yet started the process at all, therefore are less likely to have carbon disclosure or targets in place.

What progress did the Property sector make in 2021?

By using scope 1 & 2 emissions as a proxy for operational carbon emissions, we compare the absolute carbon emissions across different subsectors of the property industry from 2020 to 2021. As depicted in Figure 4, the x-axis illustrates the carbon intensity of each segment, the y-axis shows the change in carbon emissions from 2020 to 2021, and the size of each bubble represents the absolute amount of carbon emissions in 2021.

Our analysis reveals that companies in our sample decreased their carbon emissions by 4.7%[5] over 2021. From a subsector perspective, the operations of some REITs that were hit hard in 2020, namely, Diversified, Hotel & Resort, and Residential, began to recover gradually when lockdowns were lifted, benefiting from rising vaccination rates and stimulus plans. As a result, we observed an increase in absolute emissions in these sectors in 2021. On the other hand, Specialized REITs where data centers constitute a significant part, have seen a decrease in emissions. With persistent robust demand for cloud computing and data storage, it is likely that the decrease has been driven by a reduction in carbon intensity rather than a decrease in operations.

Figure 4 | Absolute carbon emissions (scope 1 & 2) per segment, 2021 versus 2020



Source: Trucost, Corporate reports, Robeco.

Box 2: Covid and decarbonization for property companies

The year 2020 was a black swan for the world and a great many economic activities were put on hold, and in 2021, countries around the world imposed lockdowns during the second wave of Covid over the winter months of 2020-21, and the third wave starting November 2021 till early 2022.

As previously discussed in another article[6], Covid hit property subsectors disproportionately. Sectors such as Office and Health Care were particularly hard-hit. When offices closed, people were forced to work from home, and even when more workplaces reopened, many people continued to do so by choice as companies transitioned to hybrid working models. Senior housing facilities had to close for prolonged periods during the peak of the pandemic.

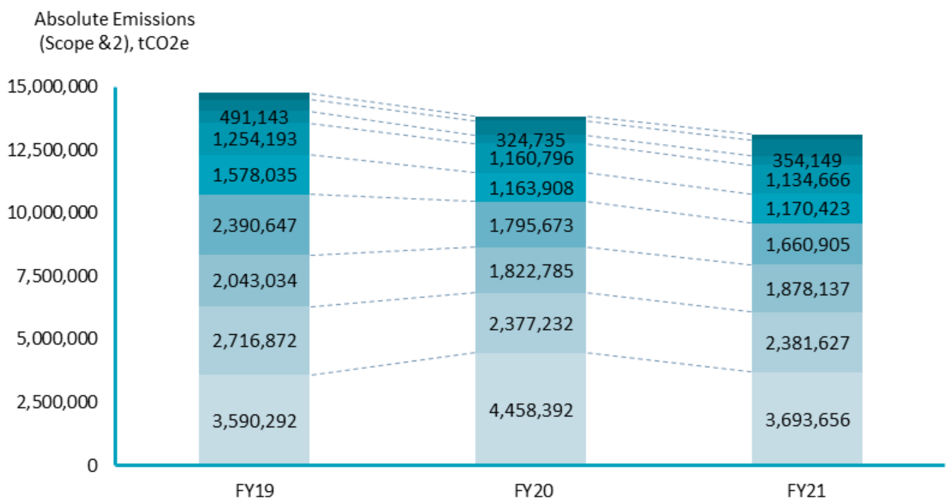
[5] This number is derived from the analysis of scope 1 & 2 emissions of companies that have disclosure for both the years 2020 and 2021.
[6] Robeco article, Covid Shows Decarbonization Strategies Essential for Property Companies.

In contrast, Industrial REITs, which invest in warehouses and distribution centers, experienced outsized growth during the pandemic due to the increase in demand for home delivery of goods, and the shift in consumer behavior towards ecommerce. Meanwhile, specialized REITs, where data centers represent a large part in this category, also saw a surge, as remote working and social distancing made digital infrastructure more essential than ever.

Figure 5 presents data on the absolute carbon emissions (scope 1 & 2) of property subsectors for the years 2019, 2020, and 2021[7], providing a holistic picture of the decarbonization performance of each sector during the pandemic. The property sector as a whole saw a decrease in carbon emissions at rates of 6.3% and 5.2% per year respectively from 2019 to 2021. This decline, however, falls short of the 7.6% decrease per year needed to meet the target set in the Paris Agreement. Indeed, one would have expected a steeper decline during the period when business activities were suspended for months. This illustrates theformidable nature of the task ahead.

It is important to note that the impact of the pandemic will distort any analysis of the progress made by the property sector in terms of decarbonization. This means that it won't be until late 2023, at the earliest, that investors will be able to judge whether the sector really is on a Paris-aligned pathway to net-zero emissions. We will then have to compare the carbon disclosure with those of 2019, the last year of the pre-pandemic era. Hopefully by then we will also have much better disclosure on scope 3 carbon emissions, which represent by far the largest part of the overall carbon footprint of the real estate sector.

Figure 5 | Absolute carbon emissions (scope 1 & 2), 2019 - 2021



	Emissions change FY20 vs FY19	Emissions change FY21 vs FY20
Specialized REITs	24.18%	-17.15%
Office REITs	-12.50%	0.18%
Residential REITs	-10.78%	3.04%
Diversified Real Estate Activi	-24.89%	-7.51%
Retail REITs	-26.24%	0.56%
Health Care REITs	-7.45%	-2.25%
Hotel & Resort REITs	-33.88%	9.06%
Industrial REITs	29.40%	13.23%
Diversified REITs	-35.85%	25.94%

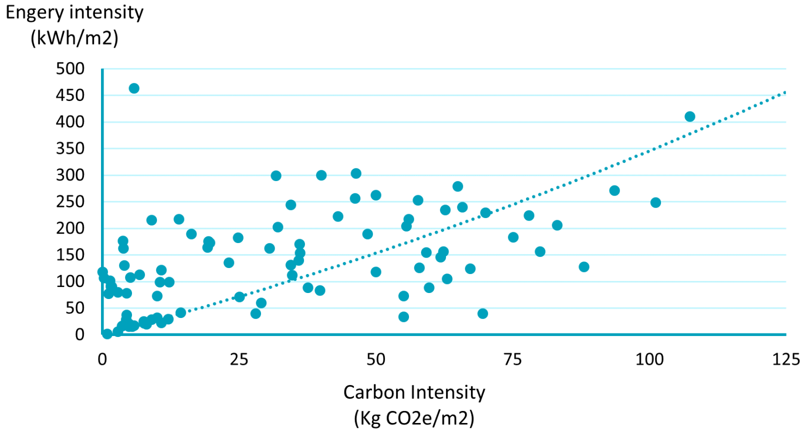
Source: Corporate reports, Robeco.

[7] The data are sourced from companies in our sample that disclosed carbon emissions in all three years of 2019, 2020, and 2021.

Energy intensity as another key factor in decarbonization

Reducing carbon emissions and improving energy efficiency are like two sides of a coin as illustrated in Figure 6. As the IEA emphasizes, "energy efficiency is one of the key ways the world can meet energy service demand with lower energy use, which is crucial in most of the IPCC GHG emissions pathways limiting global warming to 1.5ºC".[8]

Figure 6 | Correlation between energy intensity and carbon intensity



Source: Corporate reports, Robeco.

Table 2 presents that, in 2021, 157 companies in our sample, representing 82% of the benchmark weight, reported their energy usage, and 71 companies, representing 31% of the benchmark weight, set energy targets. However, a geographical analysis of the data (Figure 7) reveals notable variations, with Hong Kong (100%, 83%)[9] and Singapore (100%, 50%) displaying higher levels of both energy use disclosure and energy intensity targets setting. Conversely, the United States (68%, 30%) and Australia/New Zealand (75%, 17%) appear to be lagging behind.

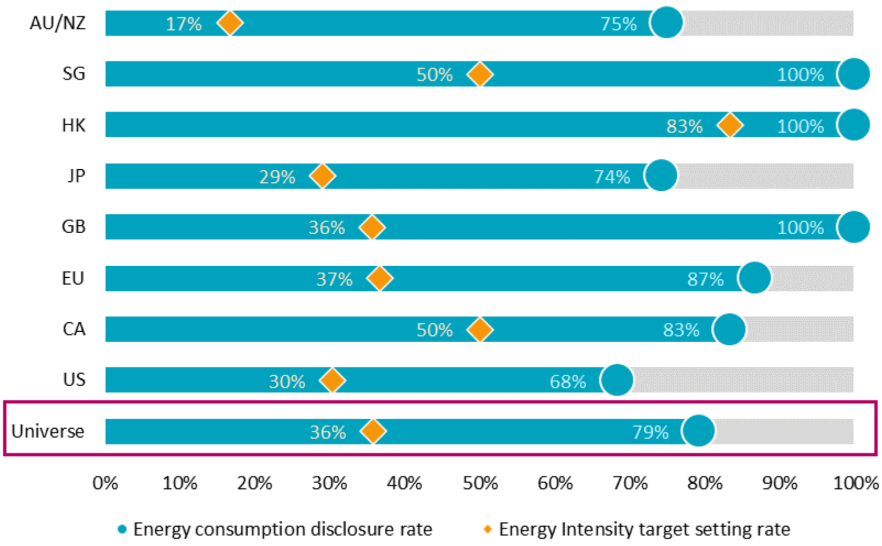
Table 2 | Disclosure of energy consumption and targets

	Energy consumption reporting	Energy target setting
# Companies	157	71
% Benchmark Weight	82%	31%

Source: Corporate reports, Robeco.

[8] IEA (2019), Multiple Benefits of Energy Efficiency.
[9] The figures enclosed in brackets indicate the percentage of companies in the geography that reported their energy usage (first number) and set energy intensity targets (second number).

Figure 7 | Energy use disclosure and target setting by geography



Source: Corporate reports, Robeco.

Energy consumption reporting and target setting is crucial. In the future, we expect binding minimum requirements of energy intensity per building to be set, with properties that fail to meet specific energy intensity levels no longer being able to be rented out. While these requirements have yet to be formally imposed, related discussions are ongoing, and in some cases, energy ratings are already a prerequisite for leasing or building transactions. Energy efficiency improvement has great potential to advance sustainability and reduce environmental impacts. Therefore, it is anticipated that future regulations will not only center on overall carbon emissions, but also on the energy intensity of individual assets. This will require large investments in retrofitting programs, as outlined in our other research[10], which assesses the cost of reducing energy intensity.

[10] Robeco white paper, The Impact of Deep Energy Retrofit Costs on the Real Estate Sector.

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