

# Green premium

Study of New York and London Real Estate  
finds strong evidence for a 'green premium'

**Real Estate & Private Markets**



# Introduction



In 2021, Bill Gates authored *How to Avoid a Climate Disaster*, a plan for the world to reduce net CO<sub>2</sub> emissions and avoid a climate catastrophe. One of the key ideas in his book was that of a 'green premium'. The green premium, in a real estate context, is described as the higher price that companies pay when renting or buying buildings with certified sustainability credentials that align with their values (BCLP, 2023).

Our research finds clear evidence of a green premium in the two largest office building markets, New York and London. While there are numerous factors that can drive green premiums, this report has focused on two of the most prominent – tenant requirement and legislation.

# Evidence pointing towards green premium

There is consensus around the existence of a green premium, although it is important to note that some studies find little correlation between sustainable characteristics and price despite others determining that green buildings can generate price premiums of over 30%. These studies have generally been focused on the office sector, where data is most available, and the drivers are clearer. However, the majority were conducted pre-pandemic and the resulting changes to the sector since 2020 have made comparability more challenging and recent findings harder to draw conclusions from.

In this report, UBS Asset Management, Real Estate & Private Markets (REPM) focuses on the two largest financial centers in the world (The Global Financial Centers index, 2023): New York and London. This research examines 1,453 office building transactions in New York and London between 2010 and 2022, running a regression to analyze the economic implications of environmentally certified commercial real estate while controlling for a wide range of factors from occupancy rates to the age of a building.

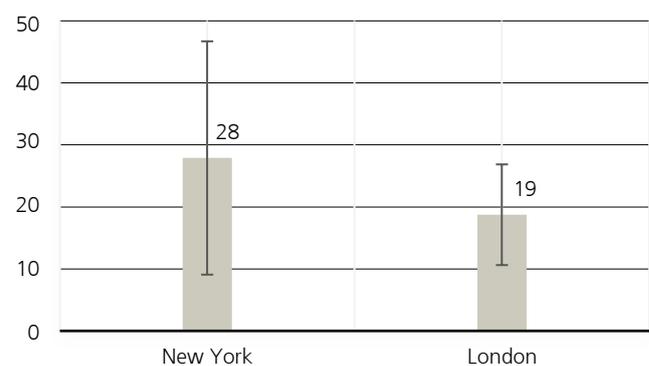
The full calculation methodology can be found in Appendix. The building transactions are sourced from RCA and the green certifications are taken from LEED and BREEAM. While the green vs non-green building debate is clearly more complicated and nuanced than certified vs not, current data constraints mean that the calculation methodology we have used here is as accurate as it is possible to achieve. However, we believe there is strength in the findings which will only get stronger as data improves. Bearing these constraints in mind, our research confirms the existence of a green premium in green-certified office buildings in New York and London.

## Certified buildings drive value in New York and London

On a price per square foot basis, New York and London see material green premiums of 28% and 19% respectively, all else being equal (location, age, renovation, occupancy, lease length), Figure 1. This relationship aligns with the findings of a recent report by MSCI based on London transactions, which found a 25% or higher gap in sale prices for those with a sustainability certification from BREEAM than those without (Leahy, 2022).

This is supported by BREEAM's finding that developers of certified buildings reported sale prices up to 30% higher vs non-certified buildings, and with value retention indicated as a main benefit of certification by 38% of surveyed property owners (Soulti and Leonard, 2017).

**Figure 1: Green price per square foot premium (%)**



Source: RCA, Walkscore.com, USGBC, BREEAM, UBS Asset Management, Real Estate & Private Markets (REPM), 2010-2022.

Further, green premium is consistently positive in 90% of the transactions in New York and London implying even at the lower end (of 90% confidence interval) certified buildings trade above non-certified. A stable green premium in London, as indicated by narrow confidence interval, implies wider market acceptance.

There are numerous factors which can contribute to a green premium, but a key one is committing to net zero. As of June 2023, around 149 countries had announced or were considering net zero targets, covering close to 88% of global emissions (Net Zero Stocktake, 2023). As real estate drives approximately 39% of total global emissions (McKinsey, 2022), it is logical that countries and companies alike will focus on real estate as a critical way of reducing their footprint.

A recent example of this is HSBC who are set to move their London headquarters. While there were other factors involved, HSBC specifically stated the move to a smaller and sustainable office would help them meet their net zero commitments (Quinio and Croft, 2023).



As an EY report nicely summarised, green buildings have proved to reduce risk and create superior exit opportunities for investors. By lowering legislative and obsolescence risk, capitalization rates are compressed, thus creating market premiums (Johnson, 2022).

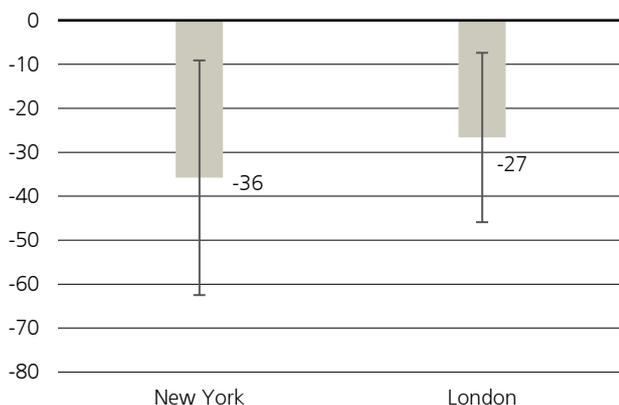
An additional way to explain the trends highlighted in the graph is to look at 'non-green buildings'. As detailed further below, the legislation and net zero requirements are greatly increasing the chance of 'non energy efficient buildings' becoming stranded assets – assets that suffer from unanticipated or premature devaluations. To alleviate this risk, a property can be retrofitted to meet required environmental standards.

However, this is an immensely expensive process. Research from JLL estimates that the cost of retrofitting the office and shopping mall stock across 17 major countries to be close to USD 3 trillion (Bolino, 2022). As a result, investors demand (or should demand) a heavy discount to consider investing in these 'non-green buildings', meaning higher capitalisation rates to reflect that risk and future costs.

### Certified buildings evidence lower cap rate in New York and London

From Figure 2, we can see that on a yield basis, certified offices trade 27bps and 36bps tighter than non-certified buildings in urban areas of London, and New York, respectively, assuming that all else is equal (location, age, renovation, occupancy).

Figure 2: Green cap rate spread (bps)



Source: RCA, Walkscore.com, USGBC, BREEAM, UBS Asset Management, Real Estate & Private Markets (REPM), 2010-2022.



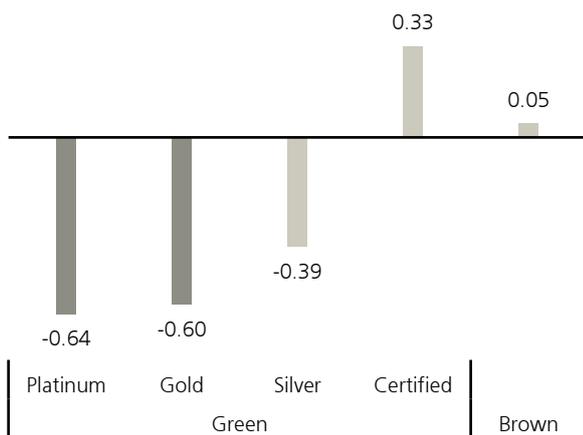
# Green buildings are not created equal

Perhaps explained by legislative risk, which is becoming a prominent factor in both New York and London, 'dark green' buildings are more desirable than 'light green' buildings. The LEED rating system, used in New York, is based on a point system. The more points a building earns, the higher its LEED rating will be. There are four levels of certification: Platinum (80+ points), Gold (60-79 points), Silver (50-59 points), Certified (40-49 points). Figure 3 shows buildings achieving LEED Platinum rating (the highest possible) are more valuable than those that obtained just LEED Certified in New York. Today's 'dark green' is tomorrow's 'light green' as legislation tightens over time.

London buildings using BREEAM certification system paint a similar picture, as highlighted in Figure 4. In BREEAM, the final performance rating is ranked from best to worst in Outstanding (>= 85%), Excellent (>= 70%), Very good (>= 55%), Good (>= 45%), Pass (>= 30%), Acceptable (>10%). Note that cap rate by 'greenness' analysis does not control for other factors due to limited sample size in certain rating categories.

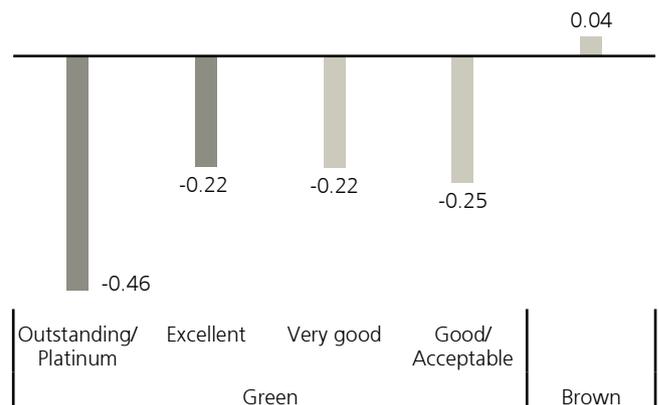
Over time, as the legislation progresses and more buildings transition to cleaner operating sources, the green premium highlighted in the charts above will likely diminish. Instead, a brown discount might emerge, instead of rewarding the most sustainable physical space with a green premium, the market will start to punish those with the worst environmental credentials as green becomes the norm.

**Figure 3: Office CBD transactions cap rate by greenness of building – New York (%)**



Source: RCA, USGBC, UBS Asset Management, Real Estate & Private Markets (REPM), 2010-2022.

**Figure 4: Office CBD transactions cap rate by greenness – London (%)**



Source: RCA, BREEAM, UBS Asset Management, Real Estate & Private Markets (REPM), 2012-2022.

# Tenant requirements and legislation propel the shift

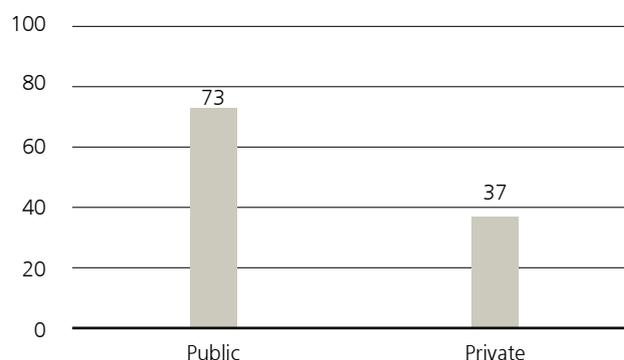
From our research, there is clear evidence of a green premium in office buildings within the two largest markets for office buildings. This highlights the importance to property owners of incorporating and considering the sustainability impacts of their buildings in their overall management approach. While there are numerous factors that can drive green premiums, this report has focused on two of the most prominent – tenant requirements and legislation.

## Tenant requirements

Various studies have confirmed rental premiums between 5-15% for properties with 'green features' across different regions (LaSalle, 2023) and operating costs 6% lower in LEED certified buildings than in non-certified buildings. (Reichardt, 2014). Indeed, a recent ESG survey by CBRE reveals that over 60% of Continental European investors and occupiers are willing to pay more for building features that reduce carbon footprint and improve health and well-being of employees (CBRE, 2023).

Globally, 73% of public companies and 37% of private companies have set emission targets, according to an analysis by CDP and Bain (Lino, Doolan, Divgi and Mehrotra, 2022). With real estate responsible for 39% of total global emissions, getting their real estate footprint right is critical for those companies with net zero commitments. Growing pressure from investors and customers alike only heighten the need for companies to seek out buildings with strong sustainability credentials.

**Figure 5: Proportion of global companies setting emissions targets (%)**



Source: CDP, Bain, May 2022.

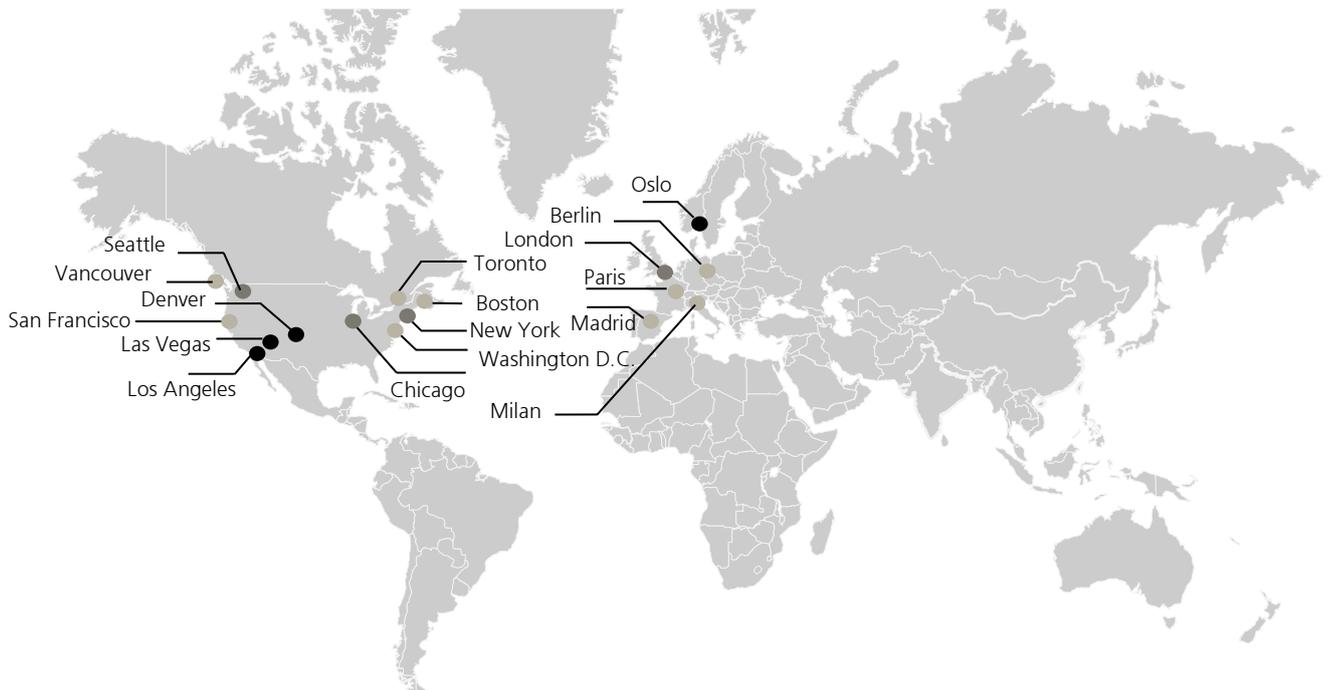
## Legislation

There has been a significant acceleration in net-zero emissions pledges announced by cities, with an increasing number enshrined in law. In the United States, 73% of major cities<sup>1</sup> have committed, in law or policy document, to zero emissions by 2050. In Western Europe, 65% has done the same<sup>2</sup>. These cities have set interim targets to reduce emissions ranging from 1% to 6% every year through 2030 (see Figure 6). Note these figures conservatively exclude cities that have made a pledge but haven't laid out the plan. If legislation progresses as expected, then buildings will have to have materially stepped up their decarbonisation efforts to remain compliant.

<sup>1</sup> Major city = city with a population greater than 500,000. 22 out of the 37 major US cities have committed to net zero. Source: Net Zero Tracker.

<sup>2</sup> Western Europe cities with a population greater than 500,000. 18 out of the 35 major European cities have committed to net zero. Source: Net Zero Tracker.

**Figure 6: Annual emission reduction implied by interim targets – North America & Western Europe**



Carbon reduction to meet respective target

- 5% or above
- 4%
- 3% or below

Source: Net Zero Tracker, UBS Asset Management, Real Estate & Private Markets (REPM), November 2023



# Retrofit cost and financial incentives

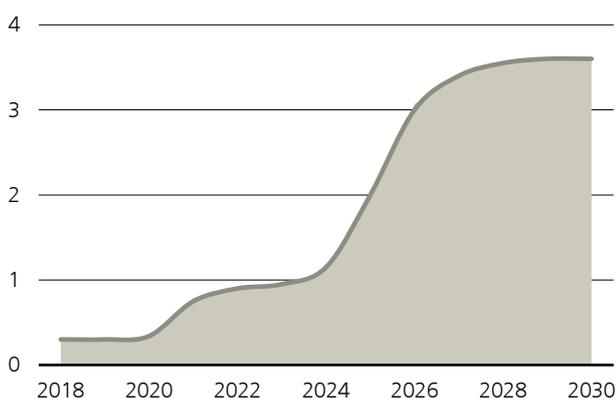
Legislation is not only the enforcer but also the enabler. One of the challenges to this transition has been the substantial upfront costs, exacerbated by inflation, associated with retrofitting existing buildings to meet sustainable standards. However, the tide seems to be changing as governments worldwide have rallied to provide unprecedented financial support.

## New York

In May 2023, New York enacted a first-of-its-kind regulation, Local Law 97 (LL97), which requires physical spaces larger than 25,000 square feet to meet emission caps or face steep fines. LL97 comes into effect in 2024 and ultimately targets a decrease in carbon emissions of 40% by 2030 and 80% by 2050. Retrofit costs to bring all buildings into compliance using efficiency measures are estimated to be USD 20 billion through 2030 with commercial spending USD 12 billion and residential spending USD 8 billion (Urban Green Council, 2019).

Compliance in the early years will be relatively easier, as low hanging wins can be identified and actioned. Hitting the 2030 target will be harder – impacting 70% of buildings and involving extensive retrofit measures like switching from gas-fuelled system to electric heat pumps. As a result, annual retrofit investment is forecasted to grow 13x to over USD 3 billion per year by 2030 from base year 2018, see Figure 7.

**Figure 7: Annual retrofit costs to keep New York buildings compliant (USD billion)**



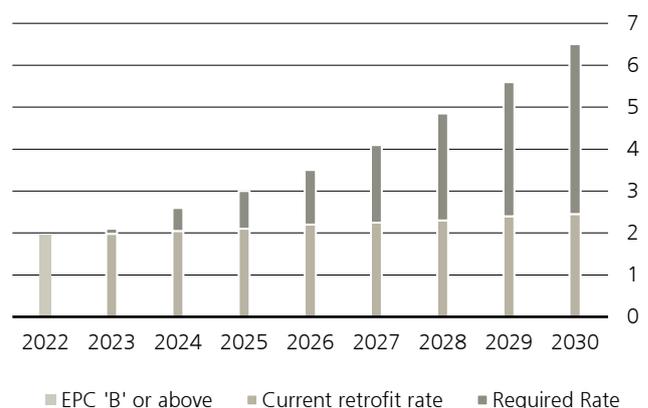
Source: Urban Green Council, June 2019.

## London

Similarly, the UK property market has the Minimum Energy Efficiency Standards (MEEs), making it unlawful for a landlord to lease or sell a building with an EPC of F or G starting in April 2023, with future tightening to EPC C by 2027 and EPC B by 2030 expected<sup>3</sup>. Retrofitting all London homes to EPC B is estimated to cost GBP 98 billion (London Councils, 2019).

Most stock that will stand in 2050 already exists. 77% of real estate in London will be non-compliant by 2030 (BNP Paribas, 2023). Despite more existing buildings are applying for BREEAM certifications than new builds, the retrofit rate as a percentage of total existing buildings is still low. Retrofit rates need to quadruple to around 17% to meet 2030 target (Knight Frank, 2023), see Figure 8. Immediate actions need to be taken to reduce the environmental impact of the aging building stock.

**Figure 8: Estimated floorspace of commercial property rated EPC B or above and forecasts at current retrofit rate and rate required to meet 2030 deadline (billion sq ft)**



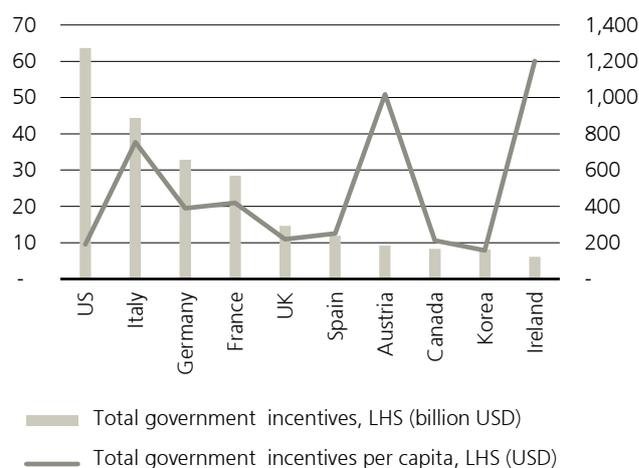
Source: Knight Frank, May 2023.

<sup>3</sup> Expected trajectory, but no confirmation yet. The British government still have not released the findings of a consultation on raising the MEEs to B by 2030, [Link](#)

Financial incentives have been recognized as a useful tool for encouraging retrofit. Collectively, governments across the globe have allocated a remarkable USD 264 billion in financial incentives tailored to promote for energy efficient buildings. Notably, around half of this pool of money is reserved for retrofits, reflecting a shared commitment to propelling sustainability within the real estate sector.

The Inflation Reduction Act (IRA) passed in 2022 represents the biggest clean-energy incentives in US history, six times the size of the 2009 stimulus bill (Mufson & Kaplan, 2021). Following IRA, the United States tops the list of countries with the largest incentives, offering consumer discounts to cover partial, or in some cases the full, cost of home-efficiency projects like installing insulation or an electric heat pump, or buying electric Energy Star appliances. On a per capita basis, European countries offer even better incentives, according to the International Energy Agency which tracks almost 1,600 latest approved/enacted government financial measures from 68 countries (see Figure 9).

**Figure 9: Top 10 countries with largest financial incentives for energy efficient buildings**



Source: IEA, UBS Asset Management, Real Estate & Private Markets (REPM), November 2023.

# Implications for asset owners

If these regulatory levers succeed, we will see 'green' real estate becoming the norm, which indeed is already the common expectation across many markets. For investors buying energy inefficient properties in New York and London, 1-3% discount in annualized return forecast through 2030 (relative to efficient) seems prudent to account for the retrofit cost needed to 'green' the asset, based on our following conclusions.

First, our back test analysis above implies 2.5% average annual return discount for inefficient properties if a seven-year holding period is assumed on average for a commercial real estate property. New York and London see green premium (price per sq. ft basis) of 28% and 19% respectively; taking a 30% haircut and spreading over seven years gives 2.5% average annualized return spread between green and non-green buildings.

Second, CBRE recently reported a 1.7% annualized return spread between efficient and inefficient UK properties. CBRE tracked 1,000 UK properties from start of 2021 through June 2023 and finds efficient buildings with top A or B EPC ratings returning 1.1% annualized; inefficient buildings with ratings of C or lower posting -0.6% return annualized (Sidders, 2023).

Third, the current retrofit rate is believed to be too low to achieve stated Net Zero targets. Today's retrofit rate is at around 1% per annum, while estimates suggest this needs to be at least 3% to achieve net zero, even higher for the logistics sector (UBS 2023).

From the perspective of an asset manager or property owner, whether legislation continues to drive premiums or tenant demand shifts further towards green, it does not matter. In either situation, returns (through either values and rent, or both) will be sacrificed if the asset owner does not account for the environmental impact that a building has.

# | Appendix



# Calculation methodology

We run the following regression testing whether green can explain valuation ...

**a.** Relative cap rate vs market = Walk score + Transit score + Age + IsRenovated + Occupancy + Lease length + Green building + Post pandemic + Size

**b.** Ln (Relative price per square foot) = Walk score + Transit score + Age + IsRenovated + Occupancy + Lease length + Green building + Post pandemic + Size

... Whilst controlling for other important factors:

- Walk score
- Transit score
- Age of building
- IsRenovated
- Occupancy
- Lease length
- Green building
- Post pandemic
- Size

## New York

There are 657 office building transactions between 2010 and 2022 in New York. Of these, 221 transactions are removed due to incomplete data. 436 transactions have been analyzed.

$$\text{Relative cap rate vs market} = -0.0005 \times \text{Transit score} - 0.002 \times \text{IsRenovated} + 0.011 \times \text{Occupancy} - 0.0036 \times \text{Green Building}$$

*(t-stat = -8)* *(t-stat = -2.5)*

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$$\text{Ln (Relative price per square foot)} = 0.020 \times \text{Transit score} - 0.864 \times \text{Occupancy} + 0.13 \times \text{Lease Length} + 0.235 \times \text{Green Building}$$

*(t-stat = 2.4)* *(t-stat = -2.2)*

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$$\text{Ln (Relative price per square foot)} = 0.020 \times \text{Transit score} - 0.864 \times \text{Occupancy} + 0.13 \times \text{Lease Length} + 0.235 \times \text{Green Building}$$

*(t-stat = 6.5)* *(t-stat = -3)*

$$\text{Lease Length} + 0.235 \times \text{Green Building}$$

*(t-stat = 2.7)* *(t-stat = 2.6)*

## London

There are 796 office building transactions between 2012 and 2022 in London. Of these, 81 transactions are removed due to incomplete data. 715 transactions have been analyzed.

$$\text{Relative cap rate vs market} = -0.001 \times \text{Walk score} - 0.00002 \times \text{Age} - 0.0027 \times \text{Green building}$$

*(t-stat = -5.1)* *(t-stat = -2.8)*

**Green building**  
*(t-stat = -2.3)*

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$$\text{Ln (Relative price per square meter)} = 0.07 \times \text{Walk score} + 0.001 \times \text{Age} + 0.169 \times \text{Green building}$$

*(t-stat = 9.4)* *(t-stat = 3.7)*

**Green building**  
*(t-stat = 4.1)*

**Walk score** – out of 100. Measures walkability of an address. Points are awarded based on distance to amenities.

**Transit score** – out of 100. Measures how well a location is served by public transit. Transit score is calculated based on nearby transit routes, their frequency, type of route (rail, bus, etc.) and distance to the nearest stop on the route.

**Age of building** – Transaction year minus construction year. The date of a transaction is recorded as the actual closing date (if known) or approximated as the earliest report of the closing.

**IsRenovated?** – A binary variable which equals to 1 if renovation year is known; and equals 0 otherwise. Renovated is defined as upgrades to be made at the time of acquisition or refinancing that add to a property's value and do not involve a change in its use or a substantial reconfiguration through construction.

**Occupancy** – For commercial property, occupancy rate is the percentage of floor space or units occupied by tenants as compared to the total leasable area of the building at the time of a sale.

**Lease length** – in years. Weighted average (weighted by surface) of the residual time of existing leases in the sold buildings.

**Green building** – A binary variable which equals 1 if building is LEED or BREEAM certified; and equals 0 if not certified by LEED or BREEAM.

**Post pandemic** – A binary variable which equals 1 if the transaction takes place after 1 January 2020; and equals 0 if before 2020.

**Size** – Square footage or meters squared (New York or London dependent).

# Green label certifications

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While there are numerous green building rating systems, this report focuses on 5 of the most significant. It is worth noting that buildings can gain certification from multiple rating agencies which can boost credibility.

## **LEED**

LEED, which stands for 'Leadership in Energy and Environmental Design', is a rating system developed by the US Green Building Council (USGBC) to evaluate the environmental performance of buildings and measure their sustainability. The LEED system provides a framework for healthy, efficient, carbon and cost-saving green buildings. It is *widely recognized as the industry standard for green building certification in the United States* and is used in over 160 countries worldwide.

The LEED rating system is based on a point system, with buildings earning points for meeting certain criteria in categories such as energy efficiency, water conservation, and indoor environmental quality. The more points a building earns, the higher its LEED rating will be. There are four levels of certification:

- Certified (40-49 points)
- Silver (50-59 points)
- Gold (60-79 points)
- Platinum (80+ points)

## **WELL**

WELL is a certification program managed by the International WELL Building Institute, and it focuses on building designs that play a role in the health and well-being of the occupant. WELL has 11 focuses when evaluating a building.

The 11 focuses are: air, water, nourishment, light, movement, thermal comfort, sound, materials, mind, community, and innovation.

WELL covers a wide range of building types, providing scores from 0-100.

## **Green Globes**

Green Globes is a rating system that is used both US and Canada. The certification program is designed so that the buildings can be self-assessed with a project manager and design team. The process includes a questionnaire that allows the applicant to question their project and later make changes to acquire the certification.

The certification covers various building types, including existing to new constructions. The primary objectives of this certification are energy usage and efficiency, water, waste management systems, emissions, indoor environment, and environmental management.

Green Globes has five tiers of certification: 1, 2, 3, 4, and 5. With 5 being the highest rating possible to achieve.

## **BREEAM**

BREEAM, which stands for Building Research Establishment Environmental Assessment Method, is the oldest certification program. Established in 1990, it is widely used around the world in over 50 countries, with over 560,000 certified and over 2 million registered.

BREEAM aims to push future buildings to focus more on sustainability, and at the same time being considerate of the building performance and its efficiency.

The rating system focuses on 9 categories: management, health and well-being, transportation, water, materials and resources, land usage and ecology, and pollution. The aforementioned Green Globes is one of the many certification programs inspired by BREEAM.

The final performance rating is determined by the sum of the weighted category scores.

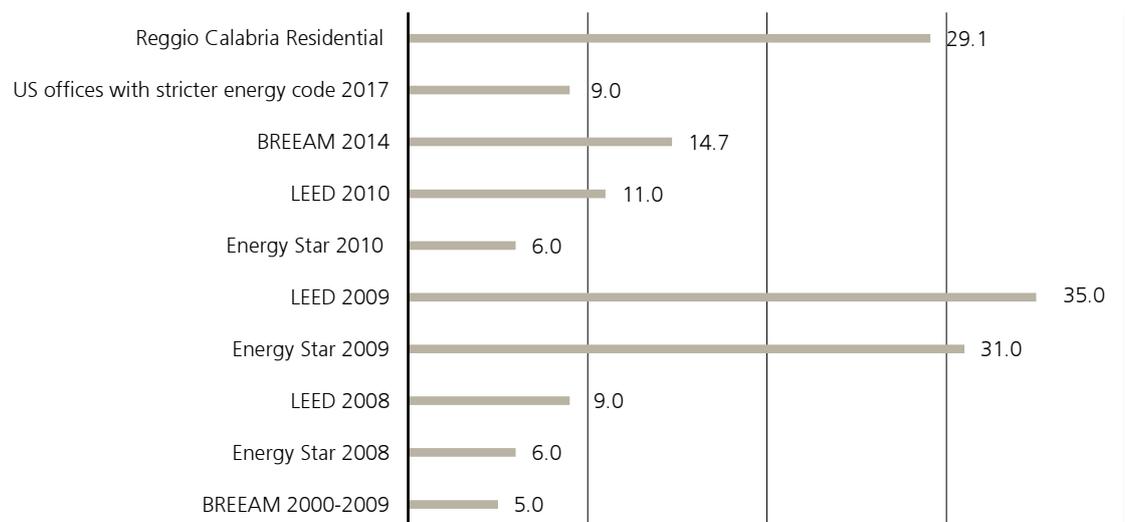
- Acceptable (>10%)
- Pass (>= 30%)
- Good (>= 45%)
- Very good (>= 55%)
- Excellent (>= 70%)
- Outstanding (>= 85%)

### Green Star

Green Star is an international rating system that is mostly used particularly in Australia and South Africa. All categories in their program include an innovation section that rewards buildings for inventing new and creative ways to approach sustainability. Green Star covers a wide range of building types, and primarily focuses on things such as indoor air quality, energy consumption, transportation, water, materials and resources, land use and ecology, and emissions.

# Green premium academic literature review

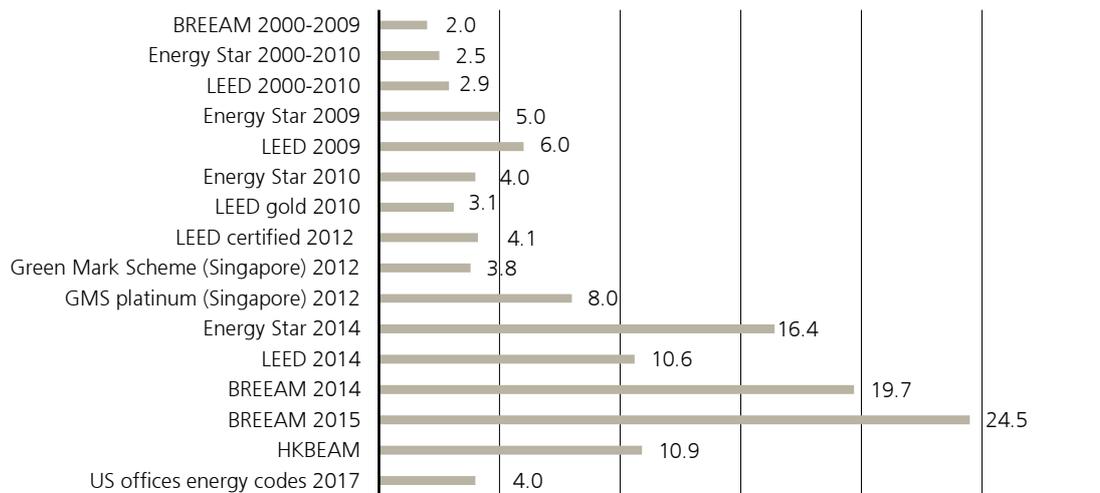
## Sales premiums (%)



Source: Andrea Chegut, et al., 2014; Norm G Miller, et al., 2008; Franz Fuerst, et al., 2009; Wiley Benefield, et al., 2010; Tunbosun B. Oyedokun, 2017; Maya Papinaeu, 2017; Macro Del Giudice, et al., 2020, Aviva Investors, 2021.

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## Rental premiums (%)



Source: Andrea Chegut, et al., 2014; Alexander Reichardt, et al., 2012; Franz Fuerst, et al., 2009; Wiley Benefield, et al., 2010; Erin A. Hopkins, 2016; Stefanie Lena Heinze, et al., 2012; Prashant Das, et al., 2013; Franz Fuerst, et al., 2015; Maya Papinaeu, 2017, Aviva Investors, 2021.

As the graphs above show, there are numerous sources highlighting a green premium, in both rent and sales, when it comes to real estate. Some of the key factors are detailed below.

## UK EPC requirements (The Minimum Energy Efficiency Standards – MEES)

The Government has recently confirmed that the future trajectory for MEES in relation to commercial property will be EPC band B by 2030, where cost effective (Simmons & Simmons, 2021). The Government estimates that the proportion of rented commercial property covered by MEES will increase from around 10% to around 85% (approximately 1,000,000 buildings across England and Wales). The Government is now consulting on proposals to deliver this policy and improve the implementation and enforcement of MEES. Key proposals from the consultation include:

A phased implementation of the EPC B by 2030 requirement, with EPC C by 2027 set as an interim milestone. This phased implementation will be based on two-year compliance windows. The first compliance window (EPC C) will run from 2025-2027 and the second window (EPC B) from 2028-2030. Landlords will be required to present a valid EPC two years before the enforcement date for each EPC target.

### Building quality

Buildings with higher standards are generally more modern, better equipped, and to attract a premium beyond the strict environmental impact. In the post COVID-19 world, tenants are likely to be more demanding on the quality of the office experience for their employees. This will favor newer buildings, with greener credentials and natural ventilation.

Almost 80% of organizations surveyed in a recent report said their employees “will increasingly expect the workplace to have a positive impact on the environment” while 75% said the same about a positive impact on society (JLL, 2021).

And the shift to hybrid working means that every day, employees think about whether there is value in going into the office, according to the CEO of Edge, a sustainable real estate developer. “We’ve seen so many examples of offices that are such low quality that people don’t want to go into the office anymore,” Coen van Oostrom said, adding that the lack of contact can cause a company’s culture to deteriorate.

### Branding impact

Offering sustainable products and positioning a brand as one that puts sustainability at the heart of its decision-making helps businesses attract new customers. Nearly four out of five participants in a recent survey conducted by Nielsen IQ stated that they valued a sustainable lifestyle. The MSCI report on green premiums in London summarizes the situation nicely “In light of the planet burning this might not seem as relevant [but] your office building is a huge reflection of your business’ brand.” (Ward-Glenton, 2023)

### Carbon offsetting price

As more investors commit to net zero and disclose their portfolio alignment, the carbon impact of real asset investments will become visible. For assets that are harder to decarbonize, buying carbon offsets may be necessary. Offset costs, whether actual expenses or used in internal decision making, could increasingly feature in asset valuations.

The carbon offset factor should also grow as demand rises; the market is still embryonic, and it is difficult to forecast its evolution. While there is huge variation in forecasts on the price of carbon, all point to significant increases. Therefore, the green premium could increase further as tenants look for ways to avoid paying increasingly expensive carbon offset prices while achieving stated net zero objectives.

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