JLL®

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Global Research

Return on Sustainability

How the ‘value of green’ conversation is growing up

Key Messages

1 A reset is underway with carbon footprint, climate change and health & wellbeing radically disrupting what constitutes a best-in-class building.

2 This reset is pushing the age-old 'value of the green premium' conversation to be one about value preservation and risk mitigation.

3 The new determinants of real estate value – carbon, climate risk and health – will trickle down to impact due diligence, buyer pool, liquidity, ability to insure and overall access to capital.

4 Climate commitments on behalf of investors and occupiers increasingly lend themselves to creating shared incentives in the pursuit of operational excellence.

5 Retrofitting existing building stock, whenever possible, will be essential to meet market demand for net-zero carbon space and is considered the responsible course of action when considering the embodied carbon implications of new construction.

6 Transitioning the built environment to being low carbon will support the health and wellness of surrounding communities.

7 Certification schemes are evolving to better reflect the new sustainability priorities. To maintain their ability to signal best-in-class building status, certifications must focus on design and performance, become carbon conscious, and tackle the intersection of green and healthy.

8 Those who wait for the perfect data, case study or research paper before they decide to lean into these structural changes will be too late.

The new language of sustainability

Evolving from:	To:
The value of green	The return on sustainability
Design	Design AND performance
Value creation	Value creation AND value preservation
Optimal building performance	Optimal building performance AND optimal human performance
Environmental	Environmental AND social (no greenwashing or rainbow washing)
Separated from the community	Integrated into the community
Not connected	Smart and connected
Green premium	Brown discount

"Green premiums are temporary, brown discounts are forever."

Guy Grainger,
Global Head of Sustainability Services and ESG, JLL

Introduction

As we begin 2022, we are a forever changed planet, one that continues to work tirelessly to overcome a global pandemic and one that is more aware and awakened than ever to the realities of climate change. We leave 2021 with the clarity of what is needed to create a sustainable world and with an increased understanding of implications for those who shape the built environment.

In fact, over the last several years, a noticeable step change in what is expected of spaces and places has been unfolding. The role that the built environment plays in the fight against climate change is clear (it accounts for almost 40% of global emissions), and the part it plays in keeping people healthy has never been more understood. In short, people expect more of buildings.

This step change in what is expected of the built environment pushes an age-old conversation to new levels: over several decades, much research has been done to quantify the 'green premium' of certain buildings. 'Green' has most often meant that a building had achieved a recognized certification and was perceived as 'best-in-class'. Today, the bar is being raised and the conversation is changing in two ways. First, best-in-class is expanding beyond green considerations to include social/health ones. Second, the conversation is developing beyond value creation (green premium) to be about value preservation (avoiding a brown discount).

This paper explores the new dimensions that are quickly developing to reframe the value conversation and highlights the urgency with which these dimensions are taking hold.

1 The age-old question answered: Yes, green-certified buildings have historically achieved a financial ROI

Since the 1990s, when green certifications were first introduced - including BREEAM in the UK and the U.S. Green Building Council (USGBC) LEED rating system - real estate investors have questioned the 'value of green'. This is not surprising, as investors continuously need to strike a balance between all their stakeholders - their capital partners on one side, their tenants/ customers on the other, as well as lenders, insurers and government entities. Balancing the needs of all those parties against their return targets, hold period, appetite for risk and the state of the economy is no small task and implies a deep need to scrutinize capital investments and expected returns.

Because of this, numerous studies over the last three decades have been conducted to quantify the green premium or value of green certifications in the form of higher rents, occupancy or sales price.

A meta-analysis of 42 studies[1] on the value of green was conducted by Dalton and Fuerst in the Routledge Handbook of Sustainable Real Estate, 2018. The studies included in the analysis spanned 14 countries, incorporated both commercial and residential property types, and were conducted between the years 2008 and 2016. Research on the value of green appears to have peaked in the 2013-2014 period. Of the 42 studies, all but 3 concluded that there is a rent premium for green certifications, and all but 4 concluded a sales premium exists as well. In fact, the meta-analysis concluded that, overall, green certifications result in a rent premium of 6% and a sales premium of 7.6%.

The table below shows a more detailed breakdown of the results:

Green certification real estate premium	Overall	Commercial	Residential
Rental Premium	**6.0%**	**5.4%**	**8.2%**
Sales Premium	**7.6%**	**11.5%**	**5.5%**

Source: Dalton and Fuerst

Green certifications result in a rent premium of 6% and a sales premium of 7.6%

These findings are in line with research that JLL conducted in 2020 which focused on Central London and showed that BREEAM 'Outstanding' buildings recorded rent premiums between 4% and 11% and enjoyed 100% pre-leasing compared to 50% for standard properties. All of this data confirms a value premium for green certifications. The time has come to evolve the conversation.

[1] The 42 studies include notable work such as Fuerst and McAllister (2011), Chegut, Eichholtz and Kok (2014), Das and Wiley (2014), Reichart (2014), Devine and Kok (2015), Fuerst and van de Wetering (2015), Robinson and McAllister (2015), and Bond and Devine (2016).

2 New dimensions are quickly emerging to influence the value conversation

The following three dimensions are rapidly increasing in prominence and are expected to shape the value conversation in coming years:

Climate risk and resilience

It is no longer possible to ignore that extreme climate events are increasing in frequency and intensity.

Carbon emissions

Growing climate commitments and a shifting regulatory landscape will make occupiers and tenants more carbon conscious.

Occupant health

Buildings will be graded on their ability to optimize health, wellbeing and human performance.

In April 2021, JLL surveyed nearly 1000 executive leaders, investors and corporate occupiers, and found that:

83%

of occupiers and 78% of investors believe climate risk is financial risk.

79%

of occupiers anticipate that carbon emissions reduction will be part of their corporate sustainability strategy by 2025.

42%

of occupiers believe that their employees will increasingly demand green and healthy spaces.

Climate Risk and Resilience

Just this year, we've seen the highest-ever recorded temperature in Europe, massive wildfires in Asia and the United States, and extreme precipitation in Germany, China and many other parts of the world — all causing severe damage and loss of life. According to the National Oceanic and Atmospheric Administration (NOAA), extreme storms (those that incur at least US$1 billion in damage) have increased fourfold in the last four decades.

Climate risk is increasingly a key consideration for investors, insurance companies and lenders.

In the context of climate change and intensifying weather events, investors and occupiers are increasingly using a climate-risk lens when considering new markets to migrate to and buildings to occupy, buy or sell. Insurance companies and lenders will refine their pricing and lending accordingly. In addition, countries like the UK, France, Germany and Canada have established some level of mandatory climate-related financial risk disclosure; this is in discussion in the U.S. and many other parts of the world.

Many third-party climate risk data firms are already working with the aforementioned stakeholders above to analyze physical risk to an asset or portfolio. These tools allow users to look at a cross-section of chronic perils such as heat, sea-level rise and drought, and acute perils like hurricanes and extreme precipitation, over the next 10-30 years under a multitude of climate scenarios. Other tools are materializing to help investors select target markets for investment. Lastly, climate tech tools are emerging to evaluate how 'hard' or protected an asset is against extreme climate risk, what capital investments are needed to harden the said asset, what those would cost and what value is at risk given various climate scenarios if investments aren't made. The industry is on a learning curve as it pertains to these tools and their optimal application, but as they become more mainstream, these considerations will influence value calculations.

The table below from the UN Environment Program - Finance Initiative (UNEP-FI) clearly demonstrates all the ways that climate risk can impact income, expenses, exit price, liquidity and financing.

Anticipated effects on commercial real estate asset performance of increased exposure to climate risk

Increased risk in location stemming from more frequent and/or severe weather events	Effects on cash flow	Income	Reduced rent from fall in demand
			Reduced occupancy rate from fall in demand
			Longer to re-let space/weaker tenants
			Changes to feasible uses impacting on income
		Outgoings	Increased operating costs (building services)
			Increased capital costs (repair/restoration)
			Higher insurance premiums to reflect higher risks
			Higher property taxes (clean up and mitigating costs)
	Effects on capitalization rate	Risk premium	Greater cash flow volatility
			Reduced liquidity/saleability of asset
			Reduced insurability of asset
			Greater site and location risks
		Expected growth	Reduced rental prospects for location
			Increased depreciation for non-resilient buildings
			Reduced future occupancy rates
			Increased operating and capital costs, taxes, etc.
	Effects on financing	Cost of finance	Higher margins stemming from increased risk
			Higher DSCRs to cover cash flow volatility
		Availability of finance	Reduced willingness to lend in locations
			Lower amounts lent/more security sought
			Fewer potential equity partners

Developed with reference to de Wilde and Coley (2011)

Source of graphic: UNEP Finance Initiative, "Climate Risk and the impact on Real Estate Values", August 2021.

From capital raising to buy/sell decisions, underwriting, financing and resilience planning, climate change will impact every part of an asset's life cycle; it is entering the mainstream investor dialogue more and more. Finally, while not widely observed today, all stakeholders should remain vigilant and monitor for any early signs of redlining due to climate risk.

Carbon Emissions

In August 2021, the UN's Intergovernmental Panel on Climate Change (IPCC) issued a stark warning, announcing for the first time that human activity is unequivocally the cause of global warming and that CO_2 from fossil fuels accounts for 85% of global emissions. According to the World Meteorological Society, global temperatures have already risen by 1 degree Celsius since the late 1800s and that the pace of change is accelerating quickly. In May 2021, the concentration of carbon dioxide (CO_2) in the atmosphere reached a new high, 419 parts per million (PPM); levels unseen in hundreds of thousands of years but 50% higher than just 50 years ago.

Setting a north star

Corporates are responding to their own stakeholder pressure. At the time of writing, the number of corporations committing to climate action through Science-Based Targets in 2021 has eclipsed commitments from all previous years since inception in 2015. Additionally, at the time of writing, 4,468 corporations and 221 investors have signed up to the UN's Race to Zero.

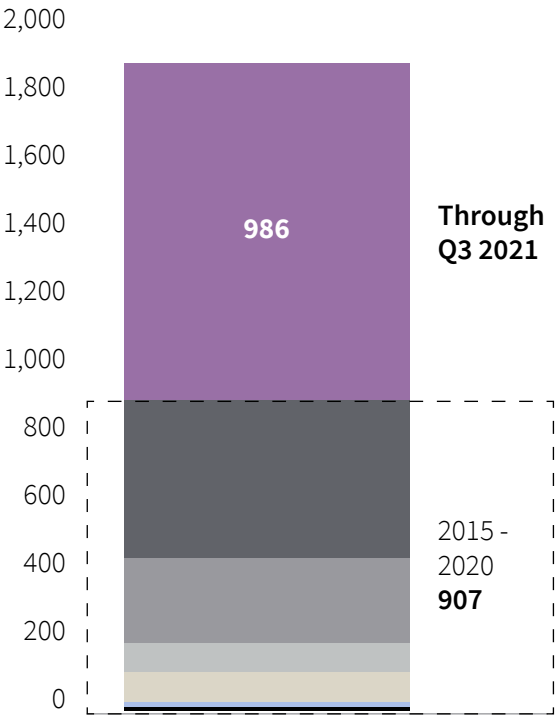
Real estate accounts for almost 40% of global emissions (in cities it is as much as 60%-70%), making this industry essential in responding to the clarion call to lower greenhouse gas emissions. The increase in corporate climate commitments points to anticipated healthy demand for net-zero carbon buildings in coming years as more organizations align their real estate to their climate goals.

In October 2021, JLL partnered with the World Economic Forum to publish The Action Plan for Net-Zero Carbon Buildings which offers a set of 10 principles to help companies deliver net zero carbon buildings and meet key climate commitments.

As demand for net-zero carbon buildings grows, we predict a strong supply/demand imbalance which will provide value premium opportunities for first movers. **As new stock will be insufficient, retrofitting existing stock, whenever possible, will be essential to meet market demand for net-zero carbon space and is considered the responsible course of action when considering the embodied carbon implications of new construction.**

Science-Based Targets - Companies Taking Action

More corporations committing to climate action in 2021 than during all previous years combined



Note: as of July 21, 2021
Source: Science-Based Targets, JLL Research

Real estate investors are therefore becoming increasingly carbon conscious. Whether they have set their own corporate net-zero carbon target, are responding to a regulatory mandate or getting ahead of tenant demand (or a combination), **investors that have embarked on this journey to net zero understand several things:**

- ✓ The process is iterative, complex, and yet, critical
- ✓ It will take several years, even decades
- ✓ The technology needed may not exist today but may be around the corner
- ✓ The grid is not ready for the building stock to be 100% electrified
- ✓ It will require balancing the needs of various stakeholders along the way
- ✓ It may cost more in certain places as they evaluate capital plans
- ✓ Climate change is happening as they transition to a low-carbon economy; they must pay close attention to both

But they also recognize the following:

- ✓ They have a fiduciary (and moral) responsibility to pay attention to these shifts
- ✓ Inaction may bring about stranded assets
- ✓ Inaction may expose the firm to transition risk (reputation, legal, market and more)
- ✓ Regulation/reporting requirements are here or imminent
- ✓ Carbon taxes may be in effect or coming
- ✓ Access to capital or insurance will become more difficult to obtain
- ✓ There is opportunity to realize significant savings in operational expenses from efficiency gains
- ✓ Demand for green/sustainable, low-carbon and healthy space will only rise
- ✓ Risk mitigation and resilience are central to these strategies
- ✓ There is a learning curve to all this, so starting 'early' has its advantages
- ✓ The window to be considered 'early' is closing rapidly

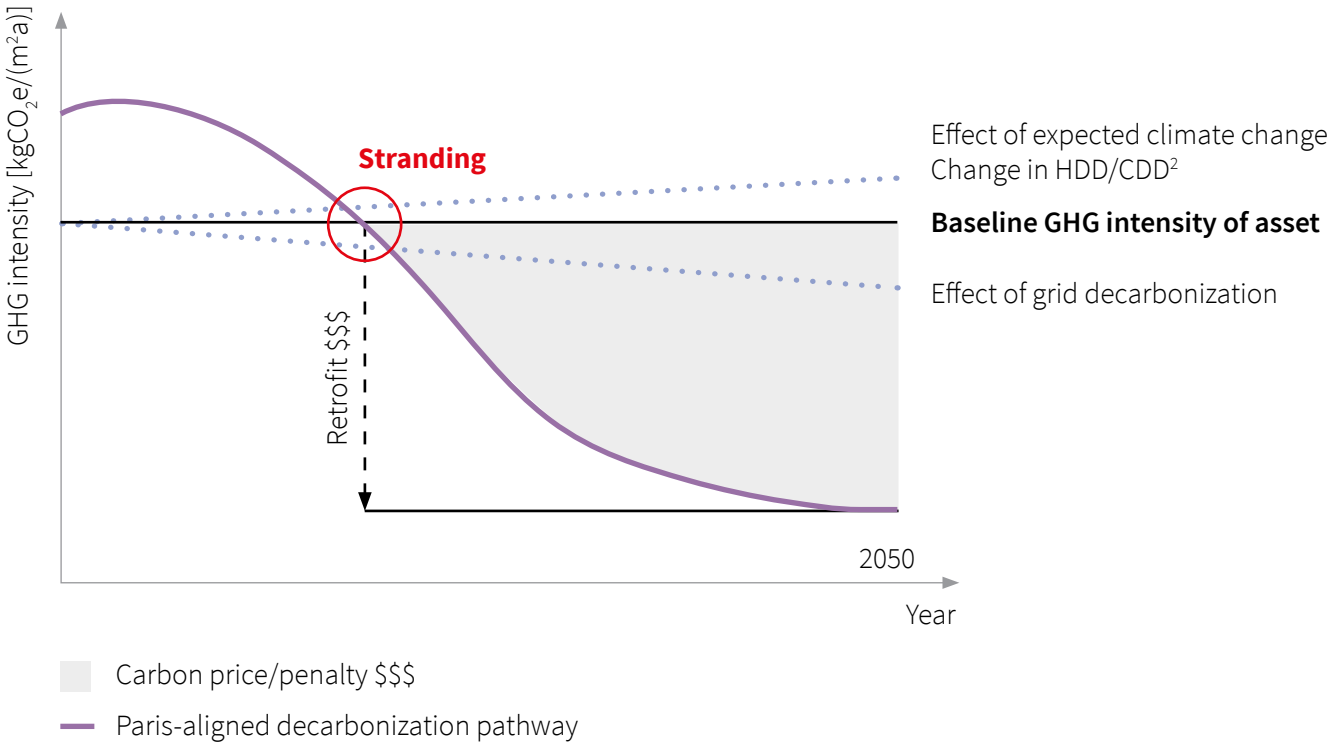
In Europe, companies are turning to the Carbon Risk Real Estate Monitor (CRREM), a tool that helps property owners understand an asset's GHG emissions and carbon footprint performance, compared to where it should be, in order to achieve net-zero carbon by a given year. It enables owners to set a north star of carbon usage goals and track their progress along the way. Owners should be mindful that a property may risk becoming a stranded asset at the intersection of the net-zero pathway and the current emissions of the property.

Only by setting this north star can a property owner comprehensively consider the carbon impacts of their decisions as they upgrade systems, fit out tenant spaces or start using newly-available technology solutions. Taking the long view increases the resilience of a building asset and/or portfolio over time and mitigates against asset stranding. Mechanisms like the CRREM tool will also enter the value conversation as owners face regulatory penalties and pricing and liquidity challenges for deferring capital projects.

Early anecdotal evidence in Europe suggests that buyer pools are already shrinking if a seller shows less than-flattering data about where a building might be on its net-zero trajectory.

CRREM asset stranding explained

Benchmarking building progress against net-zero pathway



Source: Carbon Risk Real Estate Monitor (CRREM)

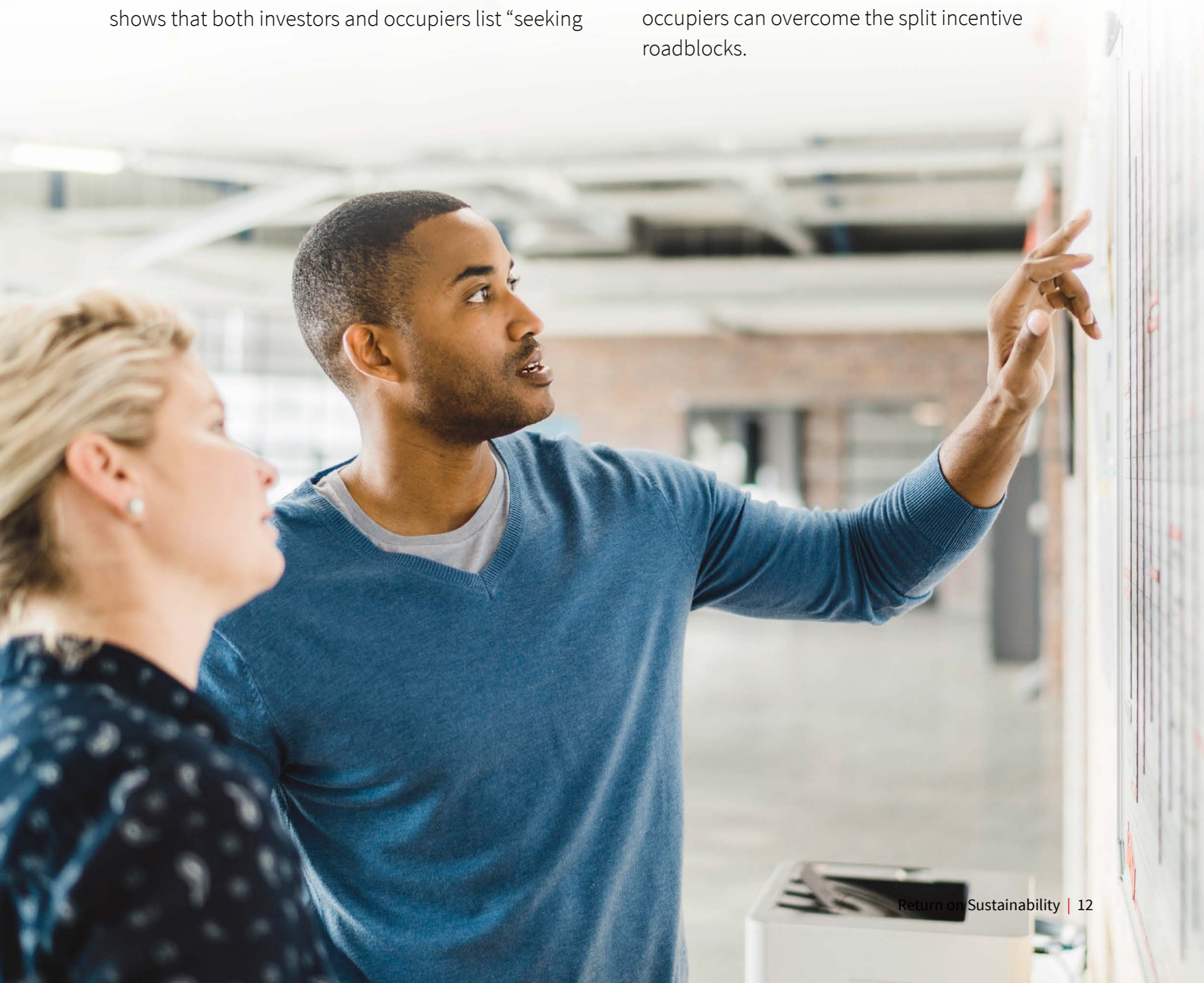
[2] HDD: Heating Degree Days
CDD: Cooling Degree Days

Shared incentives

While seemingly a win-win for owners and tenants, the benefits of sustainable building solutions vary for each party, clouding motivations and affecting investment decisions. For example, in a gross lease, where the landlord covers the utilities and charges an 'all-in rent', occupiers may not be motivated to alter their behaviors to use less water and energy or produce less waste. In contrast, in a triple net lease, where occupiers cover their utility bills, landlords may not want to pay the capital expenditures necessary to lower tenant operating expenses.

That said, JLL's Responsible Real Estate Survey shows that both investors and occupiers list "seeking operational efficiency and lowering costs" as a top motivation around setting environmental goals. In addition, as already explored, both sides are increasingly making bold climate commitments and will look to their real estate to be a part of meeting those commitments - hence, both parties will be increasingly motivated to create win-wins.

Thankfully, these challenges can be overcome with tools such as a green lease. Examples of green lease clauses that can align incentives include cost recovery, submetering, data sharing and minimum efficiency standards clauses. Through these negotiations, landlords and occupiers can overcome the split incentive roadblocks.



Occupier Health

It wasn't long ago that the commercial real estate industry started to focus on health and wellness trends like fitness classes and healthy food options – a nod to the tech giants who were first to disrupt the employee experience. **Today, after a global pandemic, the understanding of health goes well beyond an amenity package** to include more technical building characteristics like indoor air quality, temperature and humidity, as well as building operating procedures such as cleaning protocols.

The Healthy Building Team at the Harvard T.H. Chan School of Public Health, led by Dr. Joseph Allen, has been studying the foundations of a healthy building for many years and has identified nine of them (see chart below). Their work was particularly timely and transformative during the pandemic and the team has been a leading voice in how to keep tenants healthy and safe from COVID-19.

Source: Harvard TH Chan School of Public Health

A few key findings from Harvard's Healthy Buildings research

Ventilation

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) has set the recommended ventilation rate for commercial buildings at approximately 20 cubic feet per minute per person (CFM/person). These standards are designed for building optimal performance, but today the focus has shifted to human optimal performance. The Harvard study shows that by doubling the pace of ventilation to 40 CFM/person, participants improved from 62nd to 70th percentile in cognitive performance. **This change in performance is equivalent to a US$6,500 increase in productivity per person per year.**

Air Quality

Of the 82,000 chemicals we find in commercial use, 85% do not have available health data in the U.S. And in the past 40 years, the EPA has banned only four toxic chemicals. Exposure to indoor pollutants such as VOCs and carbon dioxide can have direct impacts on cognitive function. **In the U.S. alone, the savings and productivity gains from improved indoor environments have been estimated at US$25 to US$150 billion per year.**

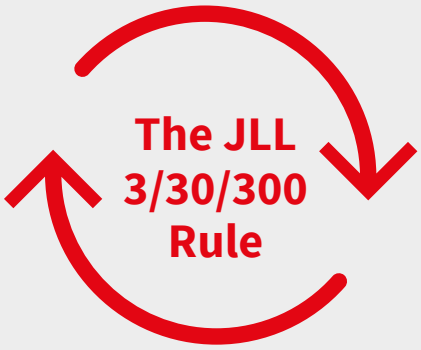
Temperature

The Harvard study showed that **for every 2 degrees Fahrenheit deviation from the optimal temperature, productivity dropped by 1%.**

Lighting

Lighting can also affect levels of alertness, concentration, cognitive processing speed and stronger performance on tests. "Mimicking the natural world by bringing in warm, lower-temperature light in the mornings and evenings and blue-enriched, higher-temperature light midday supports optimal performance."

Beyond the health and performance benefits (that do translate into meaningful savings in healthcare costs, decreased absenteeism and a rise in productivity), healthy buildings do have financial incentives. For example, as it pertains to occupiers, in their book titled "Healthy Buildings: How Indoor Space Drives Performance and Productivity", Allen and Macomber state that deploying healthy building strategies can lift a business' bottom line by 7 to 11%. And as it pertains to real estate investors, the MIT Real Estate Innovation Lab, led by Dr. Andrea Chegut, conducted a research study, "The Financial Impact of Healthy Buildings: Rental Prices and Market Dynamics in Commercial Office", that indicated rent premiums were achieved for WELL or Fitwel certified spaces - two prominent certification organizations that focus on the health and wellbeing of building occupiers. According to the study, which looked at Fitwel and WELL buildings in Atlanta, Boston, Chicago, Denver, Los Angeles, New York, Philadelphia, San Francisco, Seattle and Washington, D.C., healthy buildings pull in effective rents that are 4.4% to 7.7% more per square foot than nearby, non-certified and non-registered peers. The premium for healthy spaces is independent of all other factors, such as LEED certification, building age, renovation, lease duration and submarket.



A rule developed by JLL in 2016 demonstrates the cost differential per square foot across three factors: utilities, rent and salaries. For every US$3 a company spends on utilities, it spends US$30 on rent and US$300 on payroll. This rule demonstrates the power of real estate decisions to significantly impact the largest line item - people costs - by making employees happier and more productive.

According to a recent study in the U.S., healthy buildings pull in effective rents that are 4.4% to 7.7% more per square foot than nearby, non-certified and non-registered peers

The social returns on environmental progress deserve attention

Air pollution accounts for 10 million deaths globally per year according to a new research paper released in April 2021. The transition to a low-carbon economy and lowering greenhouse gas emissions from the built environment will save lives, reduce chronic disease and improve the health of people in surrounding communities. One tool that building owners can use in attaining these goals is the Harvard T.H. Chan School of Public Health Co-Benefit Calculator (Co-BE). Building owners will soon be able to implement these developing methods for capturing the social benefits of green strategies.

3 What does this mean for certifications?

Sustainability and wellness-focused certification systems (LEED, BREEAM, WELL and others) have long signaled that building owners care about the green characteristics of their assets, the health of occupiers or both. These certifications often play a critical role for owners to market their properties and cut through noise in the marketplace. Today, however, as we've discussed, a step change is in play resetting the bar around what is considered best-in-class and so, while not fully finalized, most certification schemes are to better reflect new sustainability priorities. Certifications need to change in a few ways to best meet this moment:

A focus on design and performance

Most certifications have been structured to consider design elements, and many rely on a checklist system to allocate points. As investors and companies make environmental and social commitments, they'll increasingly need to record and report accurate, quantifiable results achieved through their real estate to measure progress against stated goals. Buildings that adopt real-time sensor technologies which monitor CO_2 particles, temperature, comfort and employee engagement, for instance, will significantly increase the ability to quantify green, health and productivity impacts. Rather than focusing on the enabling design aspects of a building, certification systems will trend toward quantifiable results that spell out the true environmental and health impact of a building. RESET, for example, a standard first developed in China, started as a certification scheme that relies on building sensors which monitor indoor air quality. It is now evolving to consider materials, energy, water and more, using its sensors to demonstrate performance in all areas. Finally, it is noteworthy that this model and approach is now the basis of the European Foundation for Quality Management (EFQM) framework to delivering results.

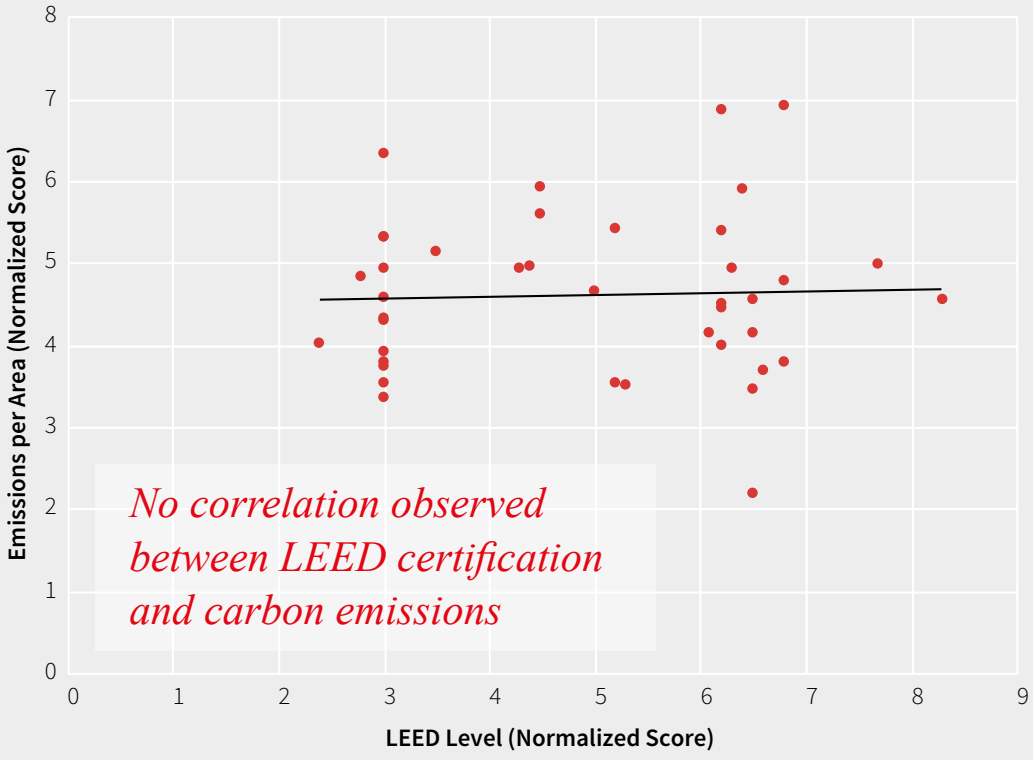
An emphasis on carbon

Up until now, a highly rated green certified building hasn't necessarily been a building with the lowest carbon footprint. For example, in the accompanying chart, JLL Research and Capital Market Quants looked at a sample of LEED properties in Boston by juxtaposing the LEED points against GHG emissions for each property. The data showed no correlation between highly-rated LEED buildings and lower emissions.

New certifications have begun to be developed to consider operational and embodied carbon.

The Canada Green Building Council v1 Zero Carbon Building Standard was the first globally to be launched in 2018. LEED Zero Carbon, NABERS Climate Active Carbon and BREEAM Built for Performance are examples of others following suit. These new carbon-centric certifications are in their infancy and include different elements in the calculation and definition of carbon footprint. Even so, the bar being reset means that all previously certified green buildings now need to be re-evaluated through a new lens.

LEED Level vs Emissions per Area



Based on a sample of top buildings in Boston
Source: JLL Research and JLL Capital Market Quants

Tackling the intersection of healthy and green

While health is becoming an increasingly large focus for building owners and companies, creating healthy spaces for people could perhaps come at the expense of the environment. For example, doubling ventilation to improve indoor air quality uses more energy. Nevertheless, innovative property technology solutions will increasingly make working at this intersection of green and healthy possible; where optimal building performance AND optimal human performance are achieved.

For instance, in relation to the ventilation example shown, according to Harvard's Nine Foundations of Healthy Buildings study, the cost of improving ventilation, estimated at US$40 per person per year in energy costs, can be brought down to US$1 per person per year when energy efficient systems are used. Healthy strategies should be integrated into a building's overall decarbonization plan bringing healthy and green goals together over time.

Other frameworks are also coming into the picture. For example, GRESB, the Global Real Estate Sustainability Benchmark, launched in 2009, has been gaining traction. At the time of writing, the benchmark covers US$5.7 trillion of AuM (up from US$4.8 trillion a year ago) and nearly 117,000 individual assets. Real estate investors submit asset and fund data to GRESB to obtain a score that demonstrates their commitment to ESG efforts. Participation grew by 24% this year, to 1,520, the highest percentage increase since 2012 and the highest ever increase in total numbers.

Participation in GRESB grew by 24% this year, the highest percentage increase since 2012.

The hope is that certifications keep pace with the great reset that is underway and with the new focus on ESG, helping owners and occupiers to continue to lean on the market signals they send.

Conclusion

People are demanding more of the built environment – holding buildings to a new standard around how they impact the planet and the lives of those in and beyond them. The real estate industry is therefore experiencing a reset in what is considered a 'best-in-class building': it is now green, net zero carbon, healthy and resilient to climate change. There is no time to waste; disruptive technology solutions are cost-effective and becoming normalized, renewable energy prices are competitive, governments are mobilized and generations are galvanized. And the momentum with which these value determinants are entering the mainstream will likely catch some flatfooted. This structural change will bring about value premium opportunities for first movers, but over time, asset stranding and brown discounts will become meaningful if owners do not manage the risks. It may be years until the true impact of health, carbon and climate on value (for better or worse) is quantified. **In the end, those who wait for the perfect data, case study or research paper before they decide to lean into these structural changes will be too late**.

To find out how we can support your global real estate market strategy with research insights and strategic advice, please contact one of the members of the global research team.

Global Research

Lori Mabardi
Senior Director,
ESG Research and Strategy
Lori.Mabardi@am.jll.com

Jeremy Kelly
Lead Director,
Global Cities Research
Jeremy.Kelly@eu.jll.com

Emily Chadwick
Lead Risk Advisor, ESG,
Valuation Advisory
Emily.Chadwick@eu.jll.com

Thank you to the Global Research Sustainability Hub as well as to many contributors

Philippe Bernier
Vice President - Strategy,
Operations & Sustainability

Jessica Bollhoefer
Senior Director,
Global Sustainability Products

Mark Bruso
Senior Manager,
Americas Research

Dan Cashdan
Senior Managing Director, Capital Markets
Equity Placement Platform Leader

Sean Coghlan
Global Director, Capital Markets
Research & Strategy

Jennifer Hill
Head M&A Strategy and Execution,
Workplace Dynamics

Cara Kennedy
VP, Sustainability Consulting

Jorge Martin
Global Head of Capital
Markets Quants, Models

Emilio Portes
Global Head of Capital
Markets Quants

Elaine Rossall
Head of UK Offices Research

Elena Tanarro Santamaria
Global Capital Markets Quants,
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Mark Wynne-Smith
Global Head, Valuation Advisory

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