



Environmental Factors & Real Estate Demand

SECULAR DRIVERS OF REAL ESTATE: DTU+E

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Executive Summary

In 2016, LaSalle added a fourth secular trend for real estate investors to focus on in the next decade and beyond. This white paper makes the case for adding environmental factors to the “DTU” secular drivers of demand we identified seven years ago.

The paper also compares the different rates of market acceptance for concepts such as “sustainability”, “green buildings” and “ESG¹ criteria” that occur in the countries where LaSalle operates. Here is a high-level summary of our conclusions:

- ▶ LaSalle has identified a broad array of environmental factors (“E-Factors” for short) that can contribute to improvements in the risk-adjusted financial performance of real estate investments. E-Factors include: energy conservation, carbon footprint reduction, climate change, water and waste recycling, and green building ratings to certify sustainable building design and operations.
- ▶ E-Factors are closely linked to other secular, long-term drivers of real estate demand such as demographics, technology and urbanization (DTU).
- ▶ E-Factors should be an important consideration in the investment analysis of portfolios and assets. Any real estate financial analysis should take into account the rising demand for the sustainability and resilience features of a building. This rising demand occurs through both regulatory and market forces.
- ▶ Investments in sustainability need to be customized for specific markets and sectors as regulations and “green building” rating systems vary greatly around the globe.
- ▶ The attributes of “sustainability” are constantly changing; so is the market response to these attributes. In broad strokes, we expect the demand for environmentally-friendly features to grow, as both tenant and investor awareness rise.
- ▶ All this means that the pricing of sustainability attributes and the return on investment (ROI) for improving the environmental performance of an asset will likely increase over time. But the analysis must take local market conditions into account. We also introduce economic and financial frameworks for analyzing the risk-return characteristics of E-Factors. These analytical tools ensure that sustainability features are appropriately priced in a disciplined way so as to improve both financial and environmental performance.

Our Goals: To explain why environmental factors are integral to investment analysis and to show how our thinking about E-Factors at LaSalle continues to evolve. To survey the range of regulatory and voluntary programs around the world that promote “sustainability”, “green buildings” and “resilience” (as well as the interpretation of what these terms mean). To introduce frameworks that establish the linkages between superior investment performance, improved environmental performance, and the risk-return trade-offs inherent in pursuing both goals simultaneously.

¹ ESG is a commonly used acronym for environmental, social, and governance principles of the responsible investing movement. This approach considers factors that contribute to the sustainability and ethical impact of an investment, in addition to the traditional financial performance metrics.

Environmental Factors and Real Estate Demand

Long Term Drivers of Real Estate Demand

Five years ago, LaSalle decided to undertake focused research on the “secular” drivers of real estate. Like many real estate fund managers, we already had a well-developed program for analyzing and predicting short- and medium-term cyclical trends in property markets. We also developed detailed capital market dashboards to help clients and colleagues track and anticipate movements in the capital markets. Finally, we continue to refine our models that link the “space” markets with asset pricing analytics to develop target markets. However, we believed that a longer-term view could be added to these tools to address trends that may not show up so clearly within a shorter time frame. Our goal: To develop an understanding of secular factors that will have an impact on real estate for a decade or longer.

As a result, we developed the DTU (demographics-technology-urbanization) research program to better understand how fundamental drivers of demand interact. Our working hypothesis is that these secular drivers have the power to shape real estate markets in ways that supersede and outlast the shorter-term property cycles. In other words, investors in long-term strategic assets should look beyond the ebb and flow of supply-demand cycles to understand long-term trends in real estate demand. In recent years, we have also worked on understanding how the supply-side and capital markets respond to these fundamental drivers. In some cases, the demand drivers can become fully- or even over-priced, once they are recognized by investors; and going chasing the same long-term trend can create a temporary over-supply situation.

Thus far, the results of the DTU research program are still being tested. We are finding that capital markets (pricing) and supply-response (development) both move quickly to follow secular drivers, once they become well understood and are perceived as “common wisdom” by mainstream investors. The evidence for secular trends accumulates slowly over time. The challenge for investors is to exploit early-mover advantage before supply-response and pricing remove some (or most) of the benefits of following—instead of leading—these long-term trends. DTU factors can be key determinants of out-performance, but only when the broader market has not fully priced their advantages, or when a rapid supply-response is constrained by regulatory or capital market factors.



Adding Environmental Factors to DTU

This paper makes the case for adding environmental factors (“E-Factors”) to the demand-side equation alongside D, T and U drivers. These E-Factors have risen in significance to the point that they deserve investors’ full attention alongside other secular trends in real estate. Most importantly, our review of the available research (confirmed by our experience with LaSalle’s portfolios) suggests that E-Factors are already influencing the financial performance of buildings in multiple ways. At the same time, we observe that mainstream investment analysis is still early in the process of recognizing the impacts of these E-Factors. Thus, the investor payback for improving the environmental performance of buildings can become a strong contributor to financial performance. However, each investment must be sensitive to cost/benefit considerations as it seeks to optimize returns.

This paper makes the case for adding environmental factors to the demand-side equation alongside D, T and U drivers.

A wide and growing range of environmental factors have been on our radar screens and part of our asset management best practices for over a decade. They include: air quality issues, climate change, energy conservation, greenhouse gas emissions, water scarcity and tenant preferences for buildings with strong “green” credentials. Just as the DTU drivers continue to evolve, the economics and the political forces generated by environmental factors shift and change. Recent examples include:

- ▶ Better understanding of the resilience features of a building or an entire submarket that is subject to flooding or other extreme weather events,
- ▶ The evolving economics of renewable energy sources, energy efficiency, water reduction, and recycling as scale economies start to be approached and new technologies come into use,
- ▶ The definition of sustainability expanding beyond environmental factors to include social issues such as diversity, inclusion, and social justice in order to bring the benefits of sustainability and economic opportunities to broader segments of society.

LaSalle has also been closely tracking the growing awareness by governments and regulatory bodies to the E-Factors. National and local government entities both realize that real estate is a major user of energy and water and that activities inside buildings are major generators of recyclable waste. Therefore, the construction and management of the built environment can play a major role in reducing carbon emissions, improving water and energy conservation, and stopping unsustainable waste disposal practices. We also observe that political forces re-shuffle the priorities in nearly all countries from time to time, so that regulatory change is constantly moving, just as market forces also change.

Despite many common concerns at the global level, the regulatory responses to the environmental or E-Factors vary greatly by country, by metro and by municipality. Moreover, the broader market effects—rising tenant preferences for sustainable, healthy, and flexible spaces for work, social interaction, shopping, leisure, storage/distribution and residential living spaces—also vary greatly between and within countries. Nevertheless, like other secular drivers, our hypothesis is that a broad array of E-Factors will eventually influence real estate usage and investment performance across nearly all countries where LaSalle invests. Finally, as we discuss in the subsequent sections, the changing priorities of investors, especially those who adhere to ESG principles, will add an important valuation dimension to the preference for sustainable properties.

Figure 1: The Secular Demand Drivers for Real Estate DTU + E



Source: LaSalle (01/17)

LaSalle's Approach to Sustainability

Over the last ten years, LaSalle has developed a strong commitment to environmentally sustainable practices in the operation of the buildings we manage. LaSalle was an early signatory to the United Nations Principles of Responsible Investment that reinforced our commitment to factors beyond financial performance when evaluating investments. We also made a commitment in 2011 to capture baseline data and then to monitor progress toward improvement goals for reducing the carbon footprint of the buildings we manage². We realized that the same socio-economic forces that were leading our firm to allocate more resources to adopting ESG goals likely meant that, in time, other investors and tenants would also. Thus, in order to “future-proof” our client’s portfolios, the firm made a serious commitment to focus time and resources on understanding how, when and where sustainability attributes might be adopted in various markets.

In framing the E-Factors in LaSalle’s approach, we include broader concepts like resilience (which focuses on adaptation strategies for climate change, in contrast to mitigation strategies for greenhouse gas emissions), social sustainability (which focuses on economic/social justice issues), and health/welfare (which focuses on the well-being and safety of individuals who build, occupy and travel to buildings). The real estate industry’s experience in developing

best practices associated with this broader scope of issues is not yet as well-established as narrower environmental considerations. However, as we look ahead, LaSalle expects that “sustainability” will gradually expand from a focus only on the management of a building’s “carbon footprint” to include the inevitable consequences of climate change. This approach acknowledges that no sustainability initiative can quickly reverse decades of ever-higher levels of carbon dioxide and other greenhouse gases put into the atmosphere. The broader approach also acknowledges that human factors—how people interact with buildings—also deserves attention. In other words, real estate investors have a role to play in how buildings contribute to a healthy and just society, as well as in better stewardship of natural resources like air and water. Finally, the concept of “resilience” suggests that it will be prudent for property investors to anticipate that severe weather (high winds, flooding, higher heat and droughts) will occur regardless of humankind’s success or failure at reining in its impact on the natural environment, and should be considered at both the building level and the city or regional level for potential to impact business operations and consequently long-term performance.

By adding “E” to the DTU framework, we are committing to continue to conduct and review rigorous research in order to determine how our clients can benefit from sustainability initiatives.

How Do Environmental and Social Factors Interact?

Sustainability is often understood to only mean environmental sustainability². In fact, the use of “sustainability” has evolved to take on the broader understanding that any activity, be it a business or otherwise, should address environmental, social and economic factors in order to endure (and hopefully thrive) in the long term. Investors often use the acronym “ESG” (environmental, social and governance) to describe the interconnected attributes needed to insure that any firm, investment process or asset is truly “sustainable”.

These may feel like disparate categories to group together, but by overlaying these three elements onto the search for strong investment returns, the concept of responsible investment becomes clear. As corporations or partnerships, we have a moral imperative to act as good corporate citizens, while also

being a responsible fiduciary of our clients’ capital. Effectively, in order for an investment to perpetuate in the long term, the impacts of that investment activity on both the environment and on society must not be destructive, while providing market rate returns. Given that most institutional investors (pension funds, endowments, insurance companies) hope to serve their participants and clients over the long term, this is a sensible business decision to be making now to protect future returns and asset values.

While we have added Environmental Change to our secular trends, we have not added a separate pillar for social factors as we have already addressed these in the three existing pillars of DTU. The definitions of these existing pillars will certainly evolve over time, but for example, adapting workplaces to deliver

health, well-being and productivity sits within Demographics, and a focus on community well-being is a clear fit within Urbanization.

These DTU+E drivers often overlap and usually work together in terms of both the demand-side and the supply-side response. In some cases, tension between competing goals arises, for example, when seeking the highest levels of indoor fresh air will require a level of energy consumption that is unlikely to maximize a building’s energy efficiency. However, these instances are few and far between and, in the main, environmental and social objectives are compatible and indeed complement each other. By adding E-Factors alongside the three existing pillars of DTU, we are rounding out our approach to sustainability and responsible investment in LaSalle’s investment strategy.

² The mission of the Urban Land Institute Greenprint Center for Building Performance is to lead the global real estate community toward value-enhancing carbon reduction strategies that support the Intergovernmental Panel on Climate Change goals for global greenhouse gas stabilization by 2030. LaSalle is also a partner and a participant in GRESB, an organization that sets global standards for portfolio-level ESG benchmarking and reporting in real assets, covering both infrastructure and real estate. LaSalle has produced a Greenprint performance report tracking our progress toward GRESB goals since 2009.

Frameworks for E-Factors

One of the goals of this research is to understand the financial metrics that support (or do not support) environmentally sustainable investments from an investor’s perspective. An approach that puts sustainability goals above the goals of competitive risk-adjusted returns is not one most institutional investors are willing to adopt. However, an approach that discovers ways to improve investment performance through sustainable investment criteria, or which maintains strong returns while also contributing positively to the environment—these are worth pursuing. In this section, we introduce four frameworks for understanding the complexities of incorporating E-Factors into real estate investment. The first two are more conceptual in nature, while the latter two are frameworks of financial impacts.

Framework I: Financial Performance and Environmental Performance

Figure 2 below is a matrix that depicts the different combinations and trade-offs between financial performance (return on investment or ROI) and environmental improvements.

Sustainability initiatives can be mapped to several different categories:

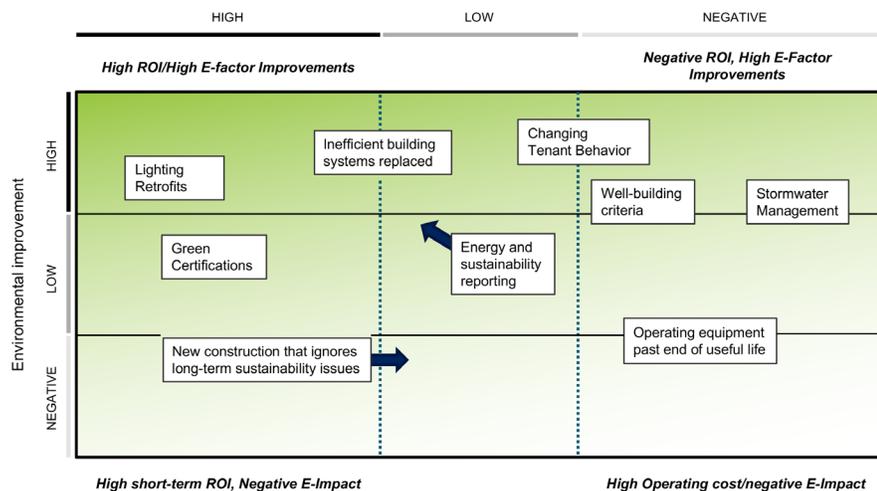
1. High ROI/High “E” improvement. These are the “low hanging fruit” of sustainability initiatives. The costs are low, the payback is fast, the economics are good, and the positive impact on the environment is significant. A good example is lighting retrofits, such as moving from incandescent to CFL or LED, or adding motion sensors that dim lights when spaces are not being used. Many of these high ROI/High E improvements involve energy or other operational expense reduction opportunities, which in addition to

operating expense reductions, can also positively impact financial performance when lease structures allow the landlord to realize the economic return on investment.

2. Low or Negative ROI/High “E” improvement. These projects have longer or uncertain payback periods and might be difficult to justify purely in financial terms. An example: Expensive storm water management/retention projects, which help surrounding properties and help prevent flooding, but where all the benefits do not accrue to building owners. Also, bringing older structures up to modern efficiency standards for energy conservation can be non-economical and are a drag on cash flow economics, but the long-term valuation impacts can turn positive once tenant retention and “green premium” economics start to come into play (cash flow negative at first, yet a positive valuation effect in the longer term). In other cases, the potential valuation payoff is so uncertain that these projects are not economically viable unless they are mandated by local regulations or public incentives are at work. An example: Earning tax credits for solar panels or wind-generating energy.

3. High ROI/Low “E” improvement. Actual “E” improvement is modest or non-existent. Examples include obtaining credentials for a building to be awarded a “green” rating, when it is already performing at a high level. There is no actual reduction in carbon emissions. These initiatives still have the possibility of attracting tenants and raising values, even if no improvement in the building management’s approach to water/recycling necessarily takes place. At its worst, this category could include “green wash” or advertising “green” features that are actually becoming standard practice or mandated by regulations. At its best, earning a high green rating could encourage competing properties to make real “E” improvements (type 1 or 2), which will benefit the broader environment. A less certain but potentially financially beneficial result may be increased capital market valuation for an asset based on its credentialed green status relative to competing unrated assets in its peer set cohort.

Figure 2: Trade-offs Between Financial Performance and Environmental Improvement



Note: Arrows indicate where the investment/environmental performance combinations will likely change over time.

4. Negative ROI/Negative “E”. This category is similar to a gas-guzzling car that has obsolete emission technology. The negative environmental externalities are high and so are the operating costs to the owner/user. However, the capital outlay needed to remedy the situation (like buying a new car or overhauling an old building) are also very high. Older buildings can be the real estate equivalent of the high polluting gas-guzzlers. Outdated building systems (40-year-old hot water heaters, obsolete air conditioning units, single-pane windows, and uninsulated walls) are all examples. These buildings are more expensive to run, even as they hurt the environment by using more energy than modernized buildings. The good news is that many of these properties can be converted to type 1 or 2 projects (High ROI/High E-improvement), once the building owner gets access to capital and addresses the obsolescence issues. The bad news is that some of these projects will never pencil out and so obsolete buildings will continue to operate with weak operating economics and environmentally-damaging practices unless a regulator intervenes. Absent regulations, or incentives to change, the status quo reigns with properties in this category.

Framework II: Eco-System of Stakeholders

The first framework we call the “Eco-System” of stakeholders who participate in real estate’s impact on the broader environment and is depicted in Figure 3 below. We recognize that we have not captured every possible stakeholder who may play a part in real estate’s environmental impact, but have chosen these as the main participants with regard to E-Factors; stakeholder perspectives are explained in Table 1.

Figure 3: The Eco-System for Understanding E-Factors in Commercial Real Estate



Table 1: Stakeholder Perspectives on E-Factors in Commercial Real Estate

<p>Tenant Perspective</p>	<ul style="list-style-type: none"> ▶ Increasing awareness of sustainability factors as an important consideration for tenants across all property types. ▶ Employee recruitment and retention often linked to a healthy and environmentally sound workplace. ▶ Consumers are increasingly interested in finding sustainability attributes where they live and shop. ▶ Tenants often control the energy and water usage within a building more than the landlord. ▶ Climate change is a factor to consider for enterprise risk management and for disaster recovery planning.
<p>Property Owner Perspective</p>	<ul style="list-style-type: none"> ▶ Rising evidence of ability to attract/retain tenants by equipping properties with sustainability features and credentials. ▶ Increasing responsibility for educating tenants on sustainable practices is becoming a standard best practice. ▶ The introduction of sophisticated sensors and environmental feedback systems is also getting more traction. ▶ Regulatory changes now and in the future will lead property owners to implement sustainable practices on energy, water and waste disposal. ▶ Green credentials and sustainability improvements have a certain cost and a likely, but less certain, benefit. ▶ Many sustainability improvements are relatively low cost and have a short payback period.
<p>Regulator Perspective</p>	<ul style="list-style-type: none"> ▶ National and local initiatives are increasing around the world. ▶ A wide diversity of "carrot" and "stick" measures have already been put in place; more are coming. ▶ Populist backlash to environmental regulations are also evident, but the dispersion and traction of this counter-trend remains unpredictable and potentially isolated in a few countries. ▶ More technology is available for enforcement and for incentive-based systems for reducing carbon emissions. ▶ International sharing of best practices is now done routinely at various climate summits and conferences.
<p>Lender Perspective</p>	<ul style="list-style-type: none"> ▶ Varying levels of awareness of sustainability issues and importance placed on them in pricing loans. Awareness among lenders generally lags that of equity investors in each market. ▶ Underwriting checklists include sustainability factors in some jurisdictions. ▶ Climate change risks and insurance coverage are essential parts of lending practices.
<p>Insurer Perspective</p>	<ul style="list-style-type: none"> ▶ An awareness of climate change risks, e.g., flood, wind, wildfire, earthquake, drought and their potential impact on insured portfolios ▶ Continued development of pricing models based on Probable Maximum Loss (PML) estimates of these risks and resulting implications for premium determination, capital deployment and coverage terms <ul style="list-style-type: none"> ▪ Model development and application supplementing traditional pricing practices based on historical loss experience ▶ Modeling also used in determining policy sub-limits for these risks, i.e., earthquake restricting coverage to amounts less than full policy limits ▶ Insurers' expectations of E-Factors could generate deteriorating loss experience and impact their future financial performance to the downside <ul style="list-style-type: none"> ▪ Increased premium rates, higher retention amounts and coverage restrictions all potential outcomes ▶ Additionally, an opportunity for insurers to distinguish themselves for competitive purposes <ul style="list-style-type: none"> ▪ New coverage offerings: 'Upgrade to Green'
<p>Investor Perspective</p>	<ul style="list-style-type: none"> ▶ A small but growing minority of investors are tracking the E-Factors in their investment portfolios. ▶ Very few investors are willing to sacrifice return or to increase risk for the sake of improving their "sustainability" credentials. ▶ However, a growing pool of investors are asking fund managers and REIT property company CEOs to report on their progress toward establishing and meeting ESG goals.
<p>Neighboring Market Perspective</p>	<ul style="list-style-type: none"> ▶ Nearby properties, businesses and people have a stake in the successful integration of E-Factors for a property. Examples include disaster preparedness plans that make a property and an entire district more resilient to extreme weather events (climate change risk). ▶ Hiring local workers at fair wages to clean and maintain a building also serves the S-factors in a building's contributions to the local economy. ▶ Voluntary efforts in local communities often promote sustainability and healthy living, i.e., farmer's markets, ride-sharing, bike-sharing and other initiatives that extend beyond the perimeter of a single building, thereby reducing the carbon footprint of the district. ▶ A market's adoption of sustainability practices and green building standards such as LEED or BREEAM, where not enforced by regulation, affects stakeholder perspectives and even potentially asset value.

Framework III: Sustainability Impacts all DCF Components of Real Estate Pricing

This first financial modeling framework addresses the sustainability features that affect the pricing and investment performance of real estate assets. A simple discounted cash flow (DCF) representation of a real estate asset helps point out which components of the DCF formula are potentially positively or negatively impacted by green building features in a given building.

The basic representation of the DCF framework helps the investor focus on three key sources of value:

- ▶ **Revenue:** To what extent do green buildings maintain or grow rental income better than buildings without it in the future?
- ▶ **Expenses:** Tenant as well as landlord costs and capital expenditures can be managed more efficiently
- ▶ **Discount Rate:** Will the required return on green buildings be lower in the future? This would reflect lower equilibrium risk premiums attached to green buildings; i.e., investors are willing to place a higher value on the future ability of the asset to generate net cash flows.

Table 2: How DCF Pricing Models Can Adapt to Financial Value Evidence of Green Buildings

Discounted Cash Flow Category	Green Attributes	Implications for DCF Formula Metrics
Net Operating Income	<ul style="list-style-type: none"> ▶ Lower operating expenses (30%) ▶ Higher occupancy rates (0.9-18%) ▶ Productivity gains (4.8%) ▶ Increased rental rates (5.8-35%) ▶ More and generally, higher net operating income (5.9%) 	<ul style="list-style-type: none"> ▶ Stronger NOI growth due to higher occupier demand as tenants start to value the productivity gains. This supports higher occupancy and rental rates. And lower operating expenses support higher NOI margin and NOI growth.
Future Value	<ul style="list-style-type: none"> ▶ Lower capitalization rates (50-55 basis points) ▶ Increased resale value (2-17%) 	<ul style="list-style-type: none"> ▶ Investors should consider a lower discount rate for green buildings due to some combination of better occupancy, lower illiquidity, lower financing margins, or less risk of obsolescence. Current research does not isolate which factor or factors are the key drivers.
CapEx	<ul style="list-style-type: none"> ▶ Limited research evidence that capital needs are higher or lower for green buildings, after controlling for the age of the building. 	<ul style="list-style-type: none"> ▶ Modern and more efficient systems along with a competitive building should reduce future major capital requirements.

Source: *Assessing the Value of Green Buildings*, Institute of Building Efficiency, Johnson Controls (2012); LaSalle (2017). See also the section on Green Premium in the literature review Green Buildings

As documented in a recent report by the Institute of Building Efficiency (IBE) that compiled the results of a number of research studies on the financial impacts of green buildings in North America, Europe and Australia, all of the key items of a DCF, (net operating income, capital expenditures, and capital value) can be impacted by the sustainability features of a building. The main evidence of the statistical impacts on cash flows (income and costs) and pricing are presented below and linked to the corresponding DCF components.

Framework IV: A Risk Premium Approach to the Pricing of Green Buildings

A risk premium decomposition framework focuses on the relative pricing of various green building components or features. This approach may be used to estimate the quantitative financial impacts on required risk premiums and required returns for green versus non-green buildings.

The risk premium decomposition presented in this chapter is based on the New Equilibrium Theory initially offered by Ibbotson & Siegel (1984³), further refined by the pricing model of Miles, Coles and Guilkey (1990⁴) and we further adapt the framework based on the 2007 EDHEC Real Estate Risk Survey⁵.

In this framework, we assume that an asset's yield is a combination of two components: a market risk component representing systematic risk and an asset specific risk. The majority of the impact on green building pricing comes from the asset specific risk components, but there are some elements that show up in the market risk components (such as the perception from lenders). These categories, components and the variance by green building are described in table 3. Investors could use this framework to estimate specific risk premium adjustments for green buildings against local market norms for each category. This requires a detailed decomposition of the expected return of real estate into specific risk categories, which is hard to support based on available market evidence. However, even without the detailed accounting of basis points of risk premium adjustment, it is reasonable to assume based on the categories and the relative outlook for green buildings that the required return from a green building should be lower than a conventional property. This difference will vary based on market, property type and asset characteristics, but will take into account the following financial impacts of a green building:

- ▶ Evidence points to green buildings being easier and less costly to finance
- ▶ Green buildings are assumed to be modestly more liquid
- ▶ Consistent with research, there is less vacancy risk for green buildings
- ▶ There is less risk of heavy capital investment requirements for systems or building re-positioning for green buildings.
- ▶ A point rarely documented in statistical research but that LaSalle has observed is that greener buildings tend to attract higher credit quality tenants.

Table 3: Risk Components and Expected Green Building Impacts

Risks	Components	Description	Green Building Impact
Market	▶ Base Yield / Real Government Bond Yield	▶ Related to country risk, the term structure of interest rates and inflation expectations.	▶ None
Market and Asset Specific	▶ Financing Margin and Fees	▶ Depend mainly on the market and lender appetite, but also contain an asset specific component (physical condition of building, lease term and tenant credit).	▶ Green buildings potentially have lower financing costs due to lenders perceiving green buildings as generally less risky.
Market and Asset Specific	▶ Real Estate Illiquidity Risk Premium	▶ Real estate assets command an illiquidity premium related to the market and characteristics of the building.	▶ Green buildings can benefit from superior investor interest, and thus lower illiquidity premiums
Asset Specific	▶ Vacancy Risk Premium	▶ The yield premium demanded based on the probability of vacancy (and cash flow voids) during the hold period.	▶ Green buildings offer a greater appeal to tenants and should command a lower vacancy risk premium
Asset Specific	▶ Obsolescence Risk Premium	▶ This accounts for both operations and functional obsolescence, and tends to increase with building age.	▶ Green buildings are likely to need less capital investment as they are "future proofed" from both an operational and functional point of view.
Asset Specific	▶ Tenant Credit Risk Premium	▶ The risk associated with the tenant credit as benchmarked to CDS spreads or alternative tenant credit rating system.	▶ To the extent green buildings appeal to higher credit tenants, this risk premium would be lower.
Asset Specific	▶ Specific Risk Premium	▶ Included to capture other specific factors such as redevelopment potential or change of relevant policy.	▶ To the extent green buildings are less likely to be impacted by future policy changes, they would have a lower specific risk premium.

The illustrative example in table 4 compares how we would estimate the discount rate of two similar medium sized office assets, similar in all features except for their Green credentials. For illustration purposes we're assuming this is an office building in Paris with a five-year lease and an expected holding period of seven years.

³ Ibbotson, Roger G. and Laurence B. Siegel (1984) "Real Estate returns: a comparison with other investments", Real Estate Economics, Volume 12, Issue 3, September, Pages 219–242.

⁴ Miles, Mike, Rebel Cole and David Guilkey, (1990), "A different look at Commercial Real Estate Returns", Real Estate Economics, Volume 18, Issue 4, December, Pages 403–430.

⁵ EDHEC European Real Estate Investment and Risk Management Survey, 2007, EDHEC Risk and Asset Management Research Center, November.

Despite the fact that empirical research is progressing rapidly, it does not yet provide enough detailed evidence to consistently document every item of the illustrated risk premium analysis. Hence we appreciate that these estimates are somewhat subjective, although they are all based on objective criteria. Nevertheless, the valuation differential below corresponds to what can be observed in some markets today.

What the table below illustrates is twofold: (i) green buildings are able to benefit from substantial risk premium advantages compared to non-green buildings; or conversely, non-green buildings will tend to increasingly suffer from “brown discounts”, and (ii) the high yield differential (here 65 bps, representing a value premium of 13.7%) is actually made of an accumulation of small risk premiums covering a range of competitive advantages spanning both market risks and asset specific attributes.

The risk premium analysis also shows that required returns for a green building should be lower than that of a non-green building. By way of illustration and using the below example and assuming that (i) yields stay flat over the holding period and that (ii) rents for both buildings are expected to grow at the rate of inflation, the required returns (equal to their yield + inflation expectations) for both buildings are 7.18% for the non-green building and 6.53% for the green building. Thus, interesting investment opportunities arise when comparable buildings (that differ only in terms of their sustainability features) have similar prices or similar expected returns.

This analysis suggests that the building with the green attributes deserves a higher price in recognition of its lower risk and that investors could consider accepting returns that are 65 basis points lower. Our additional note on this topic (released a couple of months after the publication of this paper and available as Appendix D) explains that this is not a formula that investors should apply “everywhere and always” as evidence of a price premium for green buildings is not yet evident in major markets everywhere. However, as it can be expected that this premium will become more common in the future, we believe it already gives rise to actionable strategies in many countries today.

Table 4: Example of Risk Premium Decomposition for a Building With/Without Green Features

Risk premium decomposition into unitary risk factors & corresponding premiums in basis points	Non-green building	Green building impact (in bps)	Same asset but with green features
Real Government bond yield	20		20
<i>Estimated 10-year Government bond yield</i>	200		200
<i>10-year inflation forecast</i>	180		180
Total financing margin and upfront fees	163		143
<i>Upfront fees (amortized over holding period)</i>	90	0	90
<i>Lending margin (50% LTV)</i>	150	-20	130
Illiquidity premium	70	-10	60
Vacancy risk (yield differential vs a long lease)	50	-10	40
Obsolescence (yield differential relative to building's expected life) - equiv. to capex risk *	65	-15	50
<i>Expected life of building (years)</i>	70	10	80
Tenant credit worthiness risk	170	-10	160
Theoretical yield (in %)	5.38	-65	4.73
Value Premium of Green building vs non-Green building			12%-14% **

* A more detailed formulation of the obsolescence risk premium is available from the authors upon request.

** This range assumes the Green Building impact on the risk premium is +/- 2 or 3 basis points for each category.

Source: LaSalle (2017)

Environmental Factors Globally

Sustainability standards in global real estate are changing due to evolving certification systems, market forces and governments recognizing the need to involve the real estate sector in order to meet their climate change objectives. The increasing focus on ESG initiatives in real estate is driven by both market and regulatory forces—the mix of which varies greatly across the world. Often regulatory and market drivers of the sustainability movement overlap, but even when they are different, they tend to be reinforcing rather than in conflict with each other.

Market Drivers

Sustainability improvements in the real estate industry are in part driven by market forces from both occupiers/tenants and investors.

Occupier Demand

Changes in occupier demand have played an important role in the past decade. In particular, the office market

has been moving towards both sustainable buildings as well as new types of office space being demanded by tenants. Many of the attributes that make an office building sustainable today are valued by tenants because it meets their requirements for interactive workplaces: high ceilings, natural light and improved air quality. In some cases, certification (e.g., LEED or BREEAM) is also a requirement of tenants guided by corporate values or policies.

Recent research in the US by Situs⁶ shows that 61% of corporate leaders believe that sustainability leads to market differentiation and improved financial performance. Asset owners, investment managers and developers have tried to build or refurbish buildings to match current and anticipated tenant demand but the match has not always been perfect. But it would be fair to say that sustainability improvements over the past decade and tenant demand generally overlap. Equally, many companies also have the perception that certification is consistent with the quality of buildings that meet their corporate standards. In other property types, like shopping centers and warehouses, the type of space tenants are looking for is evolving in a similar way.

Sustainability Features Demanded by Tenants

Sustainability features and tenant demand frequently overlap. In many ways the sustainability movement and tenant demand evolved together, as improvements in efficiency and technology met their shared goals. In some markets, sustainability is mandated or encouraged by regulations, which makes it critically important to maintaining the long-term value of investments.

This graphic compares sustainability attributes to tenant demand. This example focuses on the U.S. office market, but other property types, like shopping centers and warehouses, have similar overlaps. The sustainability attributes are adapted from the LEED credits for Existing Buildings, Operations & Maintenance in the 2009 rating system. The tenant demand attributes are based on input from JLL and Gensler architects, along with LaSalle Investment Management office experts. The comparison groups attributes by four shared goals. Attributes that do not contribute to a shared goal might be seen as unnecessary in terms of either creating a sustainable building or generating tenant demand, but they are not counter-productive to those goals. Tenant demand will continue to evolve, and in many cases will include more of the sustainability attributes that may not be valued today.

Sustainability Attributes	Shared Goals	Tenant Demand Attributes
Energy Efficiency, Commissioning and Performance Measurement	Efficient Operations	Energy efficient
Indoor plumbing efficiency	Healthy Indoor Environment	Column free space >40 feet
Documenting Costs	Tenant Comfort / Productivity	Efficient Water Usage
Innovation in Operation	Accessible / Healthy Locations	On-site fitness center
Cooling tower water managements	Not Shared Goals	Healthy indoor air quality
Refrigerant Management		Floor to ceiling windows
Indoor Air Quality		Natural light throughout
Tobacco Smoke Control		High Ceilings
Green Cleaning		Open collaboration spaces
Occupant comfort and Thermal Monitoring		Fully integrated ultra-high-speed, wireless internet
Daylight and Views		Updated, modern audio, visual, and technology
Control of Lighting Systems		Fast elevators
Sustainable / Healthy Landscape plan		Transit Accessible
Alternative commuting transportation		Amenity Rich Environment (retail, shops, parks, etc.)
Heat and light pollution limits		High-end interior finishes
Stormwater control		On site, high-end kitchens
LEED certified building and personnel		
Renewable Energy		
Sustainable Purchasing		
Emissions Reduction Reporting		
Solid Waste Management Policy and Plan		

⁶ It's Not Easy Being CRE Green... But It Is \$\$\$ Profitable, Situs Newswatch citing a Situs Green Report, 2017/04/12

Investor Influence

Investors are following the lead of tenants and placing more significance on the consideration of ESG factors in their investment decisions. European institutional investors, particularly Dutch pension funds, drove the development of GRESB (Global Real Estate Sustainability Benchmark) as they wanted to benchmark their funds' performance not just in financial terms, but in ESG matters too. As such, investment managers and listed real estate companies have responded, managing environmental factors both in terms of accretive value drivers (opportunities) and defensive value protectors (mitigating risks).

Accretive Value Drivers

- ▶ Increased Occupancy
- ▶ Increased Tenant Retention
- ▶ Shorter Lease-up and Down Time
- ▶ Lower Operating Expenses
- ▶ More Desirable Spaces (light, air)
- ▶ Rent Premiums
- ▶ Lower Cap Rates
- ▶ Higher NOIs

Defensive Value Protectors

- ▶ Regulatory Compliance Risk
- ▶ Functional Obsolescence risk
- ▶ Climate Risk: Flood/Wind/Fire/Drought
- ▶ Insurance Premium Risk
- ▶ Carbon + Resource Expense Risk
- ▶ Reputational Risk
- ▶ Resilience Risk: Recovery/Business Interruption Losses
- ▶ Down Cycle Valuation Risk

Regulatory Drivers

In the majority of markets where LaSalle is an active investor on behalf of its clients, sustainability is mandated or encouraged by regulations, which makes it critically important to maintaining the long-term value of investments. Over the past decade, the number and reach of these regulations have greatly increased, directly affecting the real estate industry in multiple ways. A major global milestone was reached in December 2015 with the Paris Climate Agreement, which was ratified by 174 countries as a commitment to reduce greenhouse gas emissions in order to slow the effects of climate change.⁷ These

commitments are starting to be translated into public policies, which also affects how real estate is managed. While this agreement is one of the most significant global attempts to drive sustainability improvements through regulation, regulatory drivers at more granular levels have existed for many years. The EU has introduced a raft of measures to tackle climate change over the years, with the 2010 European Performance of Buildings Directive having the greatest direct impact on real estate. However, as all EU member states maintain a level of freedom in how to adopt the goals set out in such directives, the European regulatory framework is far from unified.

In the US, while the current administration's official position on sustainability is uncertain, regulatory forces continue to evolve—many times in accordance with market demand. For example, signed into law in April 2015, the Energy Efficiency Improvement Act of 2015 contains a “Tenant Star”⁸ component that is expected to encourage optimum energy efficiency in leased commercial spaces by creating a government-sponsored certification for energy efficient tenant spaces. In Asia Pacific, Australia is well-advanced, and standard-setting is a shared responsibility of local governments and industry associations like the Green Building Council. China has recently made environmental improvement a national priority, but the regulatory focus has been on manufacturing and transportation more than on real estate. In other Asian markets (i.e., Singapore, Hong Kong, and Japan), governments have set national long-range energy reduction targets that also apply to the real estate industry. To achieve these targets, voluntary initiatives were established; but over time, additional compulsory requirements have begun to appear. Singapore, for example, now requires that new buildings be rated under the country's Greenmark System and achieve a minimum 28% reduction in building energy usage (from the baseline 2005 building regulations). Hong Kong has focused its efforts on achieving energy savings by using a voluntary + incentives approach. Tenant market demand in Hong Kong, as well as various building regulation incentives, are increasingly moving the developer community toward building more energy efficient buildings. Japan has historically relied on voluntary improvement, but is also moving toward establishing some compulsory requirements to compel improved progress towards meeting certain goals. Country summaries in Appendix A elaborate on national regulations and different rating systems that apply in different countries.

⁷ Global treaties have a checkered history in terms of ratification and compliance. As a Presidential candidate, Donald Trump campaigned for the US to withdraw from the Paris agreement. As President, he announced on June 2, 2017 that the U.S. will withdraw from the global climate pact.

⁸ https://www.energystar.gov/buildings/tenants/about_tenant_star

Global Comparison of Sustainability Standards and Transparency

Since 2012, the Global Real Estate Transparency Index—a joint project between JLL and LaSalle—has included a separate survey on transparency in environmental sustainability, covering 37 countries across the world. This survey provides a useful global comparison of which environmental building and regulatory data can be taken into account in the markets where LaSalle is most active.

The 2016 edition shows that two cornerstones of environmental transparency performance—minimum energy efficiency standards for new buildings and green building certification schemes—are now available in most developed countries. The survey specifically tracks market-specific green building certificates, as international green building rating systems such as LEED and BREEAM are available in all countries covered. The profusion of building certification schemes across the developed world is a positive first step, but the leaders in the Environmental Sustainability Transparency Index are providing a wider range of sustainability tools. Specifically, they recognize that there is a need

for measuring the actual energy performance or carbon footprint as opposed to ratings based on a theoretical assessment of a building's energy needs (such as Energy Performance Certificates (EPCs)). The growing body of work on the 'performance gap'⁹ shows that only a weak relationship exists between expected energy efficiency based on design and operational energy performance—casting doubts over the true value of some of the most-used sustainability metrics.

In Australia, the performance gap is being addressed using NABERS ratings, which are based on operational environmental performance of existing buildings. Even for new developments, NABERS measures operational performance results for at least 12 months before issuing a final rating. Actual energy performance indeed relies on tenant installations, operational management of the building and occupant behavior, not just the quality of the building design. Shifting attention away from theory and design towards operational tools in order to track real energy consumption is necessary if the real estate industry wants to have more reliable tools to manage its carbon reduction targets.



9 JLL & Better Buildings Partnership, "A tale of two buildings" (2012); Innovate UK, "Building Performance Evaluation Programme: Findings from non-domestic projects, Getting the best from buildings" (January 2016); Andy Lewry, "Bridging the performance gap – understanding predicted and actual building operational energy" (2015); Pieter de Wilde, Automation in Construction, "The gap between predicted and measured energy performance of buildings: A framework for investigation" (2014)

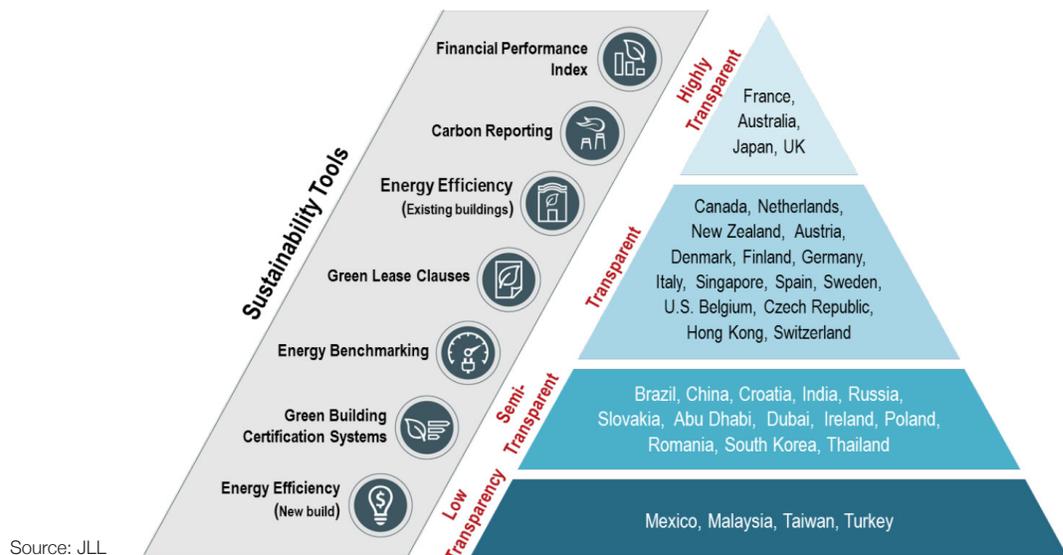
Other highly transparent countries in terms of environmental sustainability are France and the UK. With BREEAM, the UK has led the way in terms of voluntary environmental building certification and is now raising the bar for minimum energy efficiency requirements. From 2018 onwards, it will be unlawful to rent out residential or commercial properties with a low Energy Performance Certificate rating. France is the only country with a consistent framework for transitioning the real estate industry to a low-carbon economy over the next decade. The introduction of mandatory carbon reporting for institutional investors in July 2015 was a global milestone. It is also the only country in the world that makes green lease clauses mandatory for lease agreements.

Japan joined the group of 'Highly Transparent' countries in 2016. Japan's improvement has been driven by the introduction of a range of new tools, including a new energy efficiency labeling system for the non-residential sector based on primary energy use, specific guidance on green lease clauses and the introduction of mandatory minimum energy efficiency design criteria for new commercial buildings. However, LaSalle's experiences show that there is still a long way to go in terms of integrating

these tools into the daily lives of real estate investors and occupiers in Japan, as despite its mature real estate market and its long tradition of making its built environment resilient to natural disasters, Japan has been lagging in terms of sustainability considerations.

The majority of the rest of LaSalle's investment markets fall in the 'Transparent' category where most sustainability tools are more or less prevalent. The least available environmental sustainability instrument across markets continues to be that of a consistent investment performance index focused on measuring large samples of buildings that meet a certain sustainability grade or rating. Lacking these country metrics, many investors and investment managers, including LaSalle, are moving to portfolio benchmarking in the form of theGRESB, which has become the global industry standard for the assessment of the environmental, social and governance (ESG) performance of real estate portfolios. As such, it has established itself as an important tool for investors, as it significantly increased the transparency when choosing investment vehicles based on environmental standards.

Figure 4: Real Estate Environmental Sustainability Transparency Tiers 2016



Source: JLL

Environmental Factors at LaSalle

At LaSalle, our first and foremost commitment to our clients is to deliver superior investment performance. Consistent with that, we embrace the opportunity to be a leader in sustainable property investment. We recognize that real estate has a significant impact on our environment, and we seek to play a meaningful role in addressing global environmental challenges both in our public securities and private equity businesses.

Sustainability at LaSalle Securities

At LaSalle Securities, the public equity function of the business, we invest in publicly-traded real estate companies. We believe that being mindful of environmental impacts of the real estate companies' portfolios and business practices will enhance our ability to make good investment decisions. As previously noted, environmental issues proliferate both in terms of opportunities and risk mitigation and can have a positive or negative impact on the real estate companies we invest in. Each company's approach to managing these issues has potential to impact its value in the market and thus the value of our investment. We therefore encourage the companies in which we invest to manage these environmental issues appropriately in the best interest of their clients and society as a whole.

Our existing investment valuation process provides us with a framework to consider environmental issues and the way each company addresses them. We determine an intrinsic value for each stock, taking into account a multitude of factors. Environmental factors, along with other factors, are incorporated in our analysis and valuation of real estate companies

and can impact the valuation in a number of ways: they affect our projection of a company's earnings (rental rates achieved, return on cost on new developments); they affect our determination of the risk / required return for a company's real estate, business model, and management capabilities; or they affect our determination of the long-term growth potential of the company's earnings.

While we have no direct control over sustainability efforts and initiatives of each individual company, we believe in actively engaging with the companies that we invest in through constructive communications. It is in every company's interest to identify which ESG issues are critical to their business and have a material impact on their operations. We encourage them to identify ESG risks and opportunities material to their business; manage these risks effectively; enhance their corporate disclosure of ESG policies and performance; and seek industry best practices on ESG issues. Throughout our regular interactions with the companies, we want them to seek to develop and implement best practices related to each element of ESG. However, given LaSalle's exclusive focus on real estate, we find that we can add the most value by focusing our attention on the environmental sustainability factors, which directly relate to owning and operating real estate.

Sustainability and Asset Management of Direct Portfolios

Formed in 2008, our Global Sustainability Committee developed a number of best practices: a Sustainability and Responsible Property Investing Policy was written and executed; a Green Guide was developed to spread awareness amongst our asset and property managers to encourage them to improve their environmental performance; and the



Committee educated colleagues across business functions on environmental factors. When we began our efforts, we were part of a small group of first movers, but now the business environment has changed so that implementation of environmental factors is no longer an option, but a requirement. The industry expects that all firms implement these best practices.

While sustainability credentials of new developments often are given a lot of attention, reducing the negative environmental impact of our standing asset portfolio is possibly the most important, since more than half of our assets under management consist of buildings that are more than ten years old. On the basis that “you can’t manage what you don’t measure,” we started collecting energy, carbon, water and waste data for assets where we have management control. This data now allows us to understand which assets are performing well and where we need to focus our efforts for those that are doing less well. This data is reported to ULI Greenprint on an annual basis across all regions for all assets where we have access to data (there is a large portion of our portfolio where single tenants manage a whole building and therefore where our influence over the environmental performance of the asset is limited), allowing us to report on our global environmental performance.

Certification is an important tool for meeting ESG objectives in asset management, but as the critical literature on the Performance Gap shows, it should not become an end in itself. There are several assessment tools available at the asset level: Greenprint is a platform for the collection and reporting of operational environmental performance data; building-level certification systems assess either the design of the building or the operational efficiency of its management. At a corporate level, the UNPRI scores any of its signatories in their commitment to implement the Principles of Responsible Investment, while at a fund level, GRESB takes into account both the corporate activities

of the fund manager as well as the environmental performance of the underlying assets in the fund. (See Appendix C for more information on different rating systems).

Within our global framework, each region has its own approach to environmental management. For example, LaSalle’s UK business has a Sustainable Management Program in place, which has an external sustainability consultant collecting, verifying and validating the data, setting reduction targets at the asset level, and reporting quarterly progress at an asset, fund and house level. They also engage with the property teams on a quarterly basis in order to identify improvement opportunities and to track the progress of their implementation.

However, there is still much work to be done to move “best practice” to “accepted practice” and to truly embed these practices into day-to-day operations. With the advent and adoption of reporting systems that cut across all levels of real estate investment management we can no longer just “talk” about implementing environmental factors. We must “walk” the path of sustainability: to consider environmental factors from due diligence to disposition, not only implementing improvements for one-off efficiency gains, but ensuring that the management of our assets reflect our ongoing commitment to the highest standard of environmental efficiency. Whenever we acquire an asset, we must understand the sustainability qualifications, identify areas where we can improve assets, and ensure that improved environmental performance also has the potential to lead to improved investment performance. Finally, all employees across all business functions need to be not only educated about environmental factors but feel empowered to use their role to truly realize the opportunities of a sustainably managed portfolio. Only when we have successfully embedded these practices will we have moved to “accepted practice.” This day is coming.



Environmental Factors in Investment Strategy

By raising environmental considerations as worthy of close attention, we are suggesting that they will, in time, have the power to drive long-term occupier and investor demand on a vast scale equivalent to the original DTU factors. We are not suggesting that environmental issues are the only factors to consider, or that improvements in sustainability should be pursued regardless of the cost or the particular economics of each investment. Instead, we are suggesting that macro trends in environmental factors are linked to the economic incentive for all factors of production to become more flexible, resilient, sustainable, and efficient. Real estate has a reputation for being much less flexible than other forms of capital investment (technology, equipment) or labor, where recent trends in worker mobility, part-time workers and out-sourcing give employers more options. Some of this is due to real estate's inherent nature—a fixed asset with high capital costs associated with reconfiguring or adapting it to rapid changes in economic or social forces. By focusing on the E-Factors, real estate owners can improve a building's flexibility, resilience and efficiency through many of the sustainability innovations described here and in the bibliography to this report (see Appendix B).

Our aim is to help investors think about efficient ways to better analyze, price and bring the E-Factors into the risk-return evaluation of each asset.

As we pointed out in our financial impact frameworks, having a lower risk profile does not automatically make investing in green buildings the preferred strategy. Investors should account for this lower risk profile (and lower required returns) by placing a value on a green building relative to comparable assets. When the lower risk profile is not fully recognized by the rest of the market, this creates a powerful “buy” signal. A practical way to use this approach is to discover whether a green premium is appropriately priced in the market today. If expected returns for green and non-green buildings are similar in a given market, then a strong case to acquire green buildings is present. If the expected returns are hypothetically 100 bps less for a green building (due to higher market pricing) than our estimated 65 bps¹⁰, then a better risk-return strategy would be to pursue non-green buildings, with the aim of improving their green credentials at a later stage when the cost/benefit of doing so is profitable.

In summary, LaSalle believes that the E-Factors are worthy of examination on every investment considered by a real estate fund manager, in much the same way that supply-demand factors are analyzed, priced, and brought into the risk-return evaluation of each asset. Like the other macro demand-side drivers (DTU: demographics-technology-urbanization), E-Factors need to be considered in both the micro-context of specific investments and also the roll-up of portfolio-level or REIT-level metrics. Green buildings warrant different pricing, but they can still be over-priced if too many investors are chasing the same products. Investors who excel at understanding the E-Factors and incorporating this knowledge into their asset underwriting and asset management practices can achieve the maxim of “doing well (financially), while doing good (for the planet).”

Summary of Investment Recommendations

- The literature on Green Buildings shows that sustainability attributes are already capitalized into building prices and rents in many countries.
- So, the best way to capture a premium return is to improve the e-performance of a building or a portfolio during the asset management/hold period.
- Financial analysis, market analysis and improving or adding green attributes to a building all need to be done together.
- Investors are increasingly interested in ESG investing; yet many do not want to sacrifice financial returns to gain e-performance.
- Well-defined ESG metrics still have a long way to go -- the E-factors are furthest ahead in terms of being measurable.
- Over time, a high E-standard will become second-nature to the industry and will be part of the professional approach to investment management that benefits both investors and tenants.
- Also, over time, some e-features will prove their financial worth more than others.
- Government regulations that encourage sustainable practices are likely to increase; although each country is likely to follow a different path.
- LaSalle's research suggests that improving sustainability features and credentials in a building can often reduce risk by "future-proofing" a building against obsolescence.

Appendices

Appendix A: country summaries

Appendix B: literature review

Appendix C: well-established certification and rating systems for sustainability

Appendix D: LaSalle note on Capturing the Green Premium, October 2017

APPENDIX A: Country Summaries

By participating in the direct and indirect real estate investment markets in over 30 countries, LaSalle has a unique perspective on the wide range of sustainability and resilience initiatives being undertaken around the world. In this section we share the results of a survey of the largest and best-developed markets in our investment universe. The survey does not cover every country where we are active. We expect to add to this country comparison over time. Its main purpose is to give our readers a sense of the contrasts to be found in the markets that are most advanced in their adoption of sustainability and resilience practices for investment properties.

Europe



The EU Regulatory Framework

The EU has been the main initiator of legislation aimed at improving the energy and carbon performance of buildings. The 2002 **Energy Performance of Buildings Directive** (amended in 2010) requires all EU countries to implement green building measures. Importantly, it introduces minimum building energy standards, Energy Performance Certificates (EPCs) and Energy Display Certificates (EDCs), which drive energy efficiencies in the commercial sector where the “split incentives” dilemma—meaning that landlords pay for benefits enjoyed by tenants—can limit progress.

The 2009 **Renewable Energy Directive** was a key step toward setting energy and carbon reduction targets as it pushed member states to raise the share of renewable energy in their energy consumption. For example, the UK set a target of deriving 15% of energy consumption from renewable sources by 2020. The Czech Republic (14%), Netherlands (14%), Italy (17%) and Spain (20%) have similar targets. France is more ambitious with a target of 23%, while Germany tops the chart with the aim of having 40-45% of energy consumption derived from renewable sources by 2025 and 80% by 2050.

The 2012 **Energy Efficiency Directive** (2016 update pending) then established a set of binding measures to help the EU reach its 20% energy efficiency improvement target by 2020. Under the Directive, all EU countries are required to use energy more efficiently at all stages of the energy chain, from production to final consumption. With buildings accounting for approximately 40% of the EU’s energy usage, real estate has an important role to play in meeting these targets. The directive is the basis for

the EU’s Roadmap 2050 which commits its members to an overall reduction in greenhouse gas emissions to 80% below 1990 levels by 2050.

In addition, the 2014 **Corporate Social Responsibility Directive** implies that “Public Interest Entities” with more than 500 employees will have to publish information on sustainability in their official reporting from 2017 onwards.



UK

The combination of highly transparent performance data, a powerful real estate industry prone to international influences, together with the EU regulatory framework which remains in place until 2019, have made the UK an important frontrunner when it comes to implementation of environmental sustainability in real estate. Importantly, with the early introduction of Minimum Energy Efficiency Standards, the UK has one of the most impactful regulations currently in place.

National Specifics

Legislative landscape and targets. In the UK, current pace of new legislation is acting as a key driver in exerting influence on owners and investors to manage and mitigate sustainability risks in their property portfolios. The adoption of responsible property management strategies is now more common as legislation continues to pose a significant financial and reputational risk in the short, medium and long term.

The UK government has set a legally binding target to reduce national greenhouse gas emissions by at least 80% by 2050, with an intermediate target of a 34% reduction by 2020 (against a 1990 baseline). The operation of buildings currently accounts for nearly half of the UK’s greenhouse gas emissions; thus, significant improvement in new and existing building performance is required if these targets are to be met.

As part of its strategy to implement the Energy Performance of Buildings Directive (EPBD), the UK government introduced Energy Performance Certificates (EPCs) for all commercial and other non-domestic premises. EPC certificates give investors and occupiers the ability to make a comparison of the energy efficiency of several commercial properties before any purchasing or letting decisions are made. The Minimum Energy Efficiency Standard (MEES) was introduced in March 2015 by the Energy Efficiency (Private Rented Property) (England and Wales) Regulations 2015.

The MEES Regulations originate from the Energy Act of 2011.

The standards stipulate that From 1 April 2018, landlords of buildings within the scope of the MEES Regulations must not renew existing tenancies or grant new tenancies if the building has less than the minimum energy performance certificate (EPC) rating of E, unless the landlord registers an exemption. From 1 April 2023, MEES will be extended to cover all leases, including existing leases, but only if the property is legally required to have an EPC on the relevant date. As a result, forward-thinking investors are already reviewing their portfolios to reduce risks of portfolios becoming obsolete due to poor EPC ratings.

The Carbon Reduction Commitment (CRC) Energy Efficiency Scheme is a mandatory emissions trading scheme designed to minimize energy use and encourage investment in new technology aimed at reducing carbon emissions. The regulation puts pressure on investors to reduce the energy consumption of their portfolios, as high emissions results in high financial costs. The CRC scheme is being phased out in 2019, but will be replaced by a single business energy consumption tax, based on the Climate Change Levy (CCL)¹¹. As part of implementing the Energy Efficiency Directive, the Energy Savings Opportunity Scheme requires that large businesses in the UK undertake comprehensive assessments of energy use and energy efficiency opportunities at least once every four years.

Certification. A strong focus on certified green buildings is becoming more and more prominent in the UK, specifically in the public sector. Planning requirements act as a key driver for conducting certified schemes like BREEAM assessments, as more than half of the local authorities in England have a BREEAM requirement as part of their local development framework¹². Drivers for green and wellness certification schemes in the commercial property sector have been on the rise directly through client demands and environmental regulations.¹³

Occupiers' Perspective

The 2016 RICS UK Corporate Occupier Survey indicates that sustainability factors rank lower than expected when an occupier makes a decision about purchasing or renting a new property for their business. Though still significantly important, higher ranking factors such as staff, cost, size and quality, location and proximity to clients and markets are prioritized.

Research¹⁴ also shows that when occupiers require green buildings certified through schemes such as BREEAM and LEED, and are based in business sectors with strong environmental and corporate responsibility policies, more emphasis is placed on sustainability in the final choice of the building, but location and availability are still prioritized.

Investors' Perspective

The recent 2016 results released by GRESB highlight the relative importance of sustainable investment in the UK through ESG performance. The UK, with 152 UK companies responding to the survey out of a total of 759 global respondents, was the second largest contributor of data to the benchmark.

GRESB attributes the UK's exemplary performance to more developed legislation over energy performance and building certification. At a micro level, GRESB also identified that increasing engagement in ESG performance by senior leaders, more formal policy commitments and increasingly sophisticated information systems contributed to the UK's strong position.

The most notable figure of improvement presented for the UK was a 3.6% reduction in carbon emissions. GRESB also indicated that the ratification of the Paris Agreement and commitment to the Fifth Carbon Budget¹⁵ by the UK government will likely act as platforms for increased interest by investors in reporting to the survey moving forward.

LaSalle introduced the Energy Reduction Programme (ERP) in 2013, to drive energy reductions across its UK portfolio of high energy electricity and gas through energy intervention projects, and achieved a total saving of 29,109 MWh and a reduction in 8,318 tons of carbon. This translates to £1.8 million in financial savings from 2013/14 to 2015/16.

¹¹ The Climate Change Levy is a government-imposed tax to encourage reduction in gas emissions and greater efficiency of energy used for business or non-domestic purposes.

¹² James Parker, The Value of BREEAM, 2012

¹³ World Green Building Trends 2016 Smart Market Report.

¹⁴ Demand for Sustainable Offices in the UK, 2009

¹⁵ The Climate Change Act 2008 set a target for the UK to reduce emissions by at least 80% by 2050 compared to 1990 levels. The Act established a system of five-yearly carbon budgets to create the stepping stones to lead to the 2050 commitment, ensuring regular progress is made.



France

In France, sustainability considerations have been mainly promoted through European and national regulation. Large occupiers, notably in the office and retail sectors, also played a key role. After a decade of experience, investors and occupiers started to draw conclusions on both the financial and environmental benefits of green buildings. Concerns are being raised over the existence of a green premium (for investors), reduction in occupancy costs (for occupiers) and the overall effectiveness of green buildings in reducing carbon emissions (for public authorities). Nevertheless, carbon reduction objectives are becoming increasingly ambitious, pushing the bar higher for the industry.

National Specifics

Certification. France developed its own green building standard HQE (Haute Qualité Environnementale) in 1996 and its certification scheme in 2004. This initiative was led by an association of national public agencies and trade associations. Today, almost every single new retail scheme and office of over 5,000sqm benefits from an environmental certification (either HQE Construction, BREEAM or LEED). As certified buildings are becoming the norm, second-hand buildings face a higher obsolescence risk. For this reason, BREEAM In-Use and HQE Exploitation certification are increasingly used when “greening” existing buildings. Certification of buildings in their operational phase is also seen as an efficient way to reduce the performance gap between the theoretical environmental performance of newly-delivered buildings and the in-use performance of buildings.

Building thermal regulations. Since they were first introduced in 1975, the French Thermal Regulations (RT) have been upgraded several times. The latest iteration—Réglementation Thermique 2012—has had a significant impact on the construction industry by enforcing energy performance requirements for new buildings and major refurbishments. The RT 2012 provisions revolve around three coefficients used to monitor bioclimatic requirements (which measure the building’s efficiency in terms of the need for

heating, air conditioning and lighting), summertime comfort and primary energy consumption. In 2020, these regulations are planned to go even further as buildings will be required to be energy positive, i.e., to generate more energy than they consume.

Green leases. In France, the first holistic package of environmental laws was introduced in 2008¹⁶. At the time, the property industry advised the government to promote green leases, a contractual approach first developed in Anglo-Saxon countries. France is now the only country in the world that makes green lease clauses mandatory for new and existing lease agreements in the commercial sector¹⁷, for both public and private sector tenants.

Evidence of a green premium in the office sector.

MSCI France¹⁸ publishes an annual report on the financial performance—measured in total returns—of certified green office buildings relative to high-end non-green office buildings. Green office buildings have consistently outperformed non-green office buildings every year since the analysis began in 2010, with the green premium averaging 112bps over the last six years and reaching a record high of 220bps in 2015.

Occupiers’ Perspective

As elsewhere, large, blue-chip occupiers have been faster at complying with environmental regulations than smaller occupiers with more limited resources. The LaSalle/IPD survey of Paris office occupiers (2015)¹⁹ highlights the role played by large office occupiers in promoting green buildings. When occupiers were asked about future moves, 75% of the respondents said that a certified building is a prerequisite in their search for new office space. When asked about the impacts of the sustainability initiatives implemented, half of the respondents said they still lack perspective to tell if their expectations are being met in practice. Among those that have measured some gains, more than half of the respondents mentioned energy savings, higher employee satisfaction and reduced occupancy costs. However, some respondents mentioned difficulties in combining energy savings and thermal comfort. More than half of the respondents have asked for a green lease.

¹⁶ Grenelle de l’Environnement Act.

¹⁷ For buildings exceeding 2,000 sqm.

¹⁸ MSCI France Annual Green Property Indicators.

¹⁹ About 40 questions were asked to real estate directors of 30 large private companies or public organizations. These organizations occupy 8 million sqm in the Paris region, equating to 15% of the market’s office stock.

Other occupier surveys²⁰ highlight the benefits for corporates of occupying green buildings, notably: improved reputation and branding, lower occupancy costs, and improved employee well-being. The surveys also point out the limitations faced by occupiers in adopting green buildings, notably: higher occupancy costs due to higher rents relative to non-green buildings and insufficient financial gains in terms of energy savings; lack of green building stock in the most sought-after office locations; and concerns about the real environmental performance of green buildings.

Investors' Perspective

A number of French investors have a highly ambitious ESG agenda. This is reflected in the GRESB, where France is the third most-represented country after the UK and the Netherlands. The introduction of mandatory carbon reporting for institutional investors in 2015²¹ was also a milestone. This legislation requires investors to provide information on how ESG criteria are considered in investment decisions. Even if it remains unclear how carbon emissions can be reported across all asset classes, government-backed investors such as ERAFP are now incentivizing investment managers in improving their sustainability credentials. One of LaSalle's European clients, ERAFP (the French civil service pension fund, AUM: €26 billion) has one of the most ambitious ESG agendas of all European institutional investors. ERAFP's socially responsible investment (SRI) charter was approved in 2006 and has recently been updated to directly take climate change into account. LaSalle has developed a scorecard with JLL Upstream to evaluate new acquisitions based on 101 ESG criteria, from carbon emissions to protection of human rights.



Netherlands

As the JLL Global Real Estate Transparency Index for Environmental Sustainability shows, the transparency and reporting frameworks in the Netherlands are on par with most other developed countries. However, the country's influence has been much further-reaching when the worldwide influence that Dutch investors and corporates have had on implementation of sustainability into real estate is considered.

National Specifics

Certification. There are a variety of environmental certification methods present in the Dutch market, some of which originate in the Netherlands (e.g., GPR, Eco-quantum), but the Dutch version of British BREEAM certificate, BREEAM-NL has become the most commonly used method to certify new and renovated buildings. The assessment method for BREEAM-NL is administered by the Dutch Green Building Council, which was established as a market initiative to align government policy and stakeholder interests. This independent, not-for-profit organization has proven to be an important catalyst for building certification and plays a key role in representing the industry's viewpoints.

Financing criteria. A number of Dutch banks (e.g., Triodos and ASN Bank) are specifically committed to offer financing for sustainable real estate projects. However, environmental sustainability criteria are increasingly starting to play a formal role when it comes to obtaining bank financing for mainstream commercial real estate purchases or projects. In 2015, it was announced that ABN Amro would be the first bank in the world to start using ESG data to assess applications for bank financing in terms of availability and associated costs. ABN Amro now assesses not only environmental sustainability criteria but also employee well-being and location in order to assess whether a property will be future-proofed. In effect, this means that financing for a 1980s business park will be more expensive as the location, building and social criteria are falling short of what ABN Amro views should be the standard.

Minimum energy criteria for office use. Together with the UK and France, the Netherlands is the only country in the world that has formally implemented minimum energy for existing buildings. In late 2016 it was announced that from 2023 onward, all office buildings with a floor plate of more than 100 square meters will have to have an energy label (the Dutch equivalent of the EPC) of "C" in order to remain in use. This new obligation will have widespread consequences, as 52% of all office space currently has an energy label below the threshold. The government has set this threshold in order to meet the objective that the built environment will need to be carbon-neutral by 2050.

²⁰ For instance, Novethic/DTZ 2013 survey

²¹ Energy Transition for Green Growth Bill, July 2015

but also as it has been working on the basis that investments to improve to this level will have a pay-back time of less than seven years. However, since the measure was announced, many industry stakeholders have complained that this is unachievable in weaker office locations where the annual rent can be as low as €50 per square meter, while costs of refurbishment would reach €100 per square meter. The measure would therefore render a large section of the stock obsolete.

Occupiers' Perspective

The occupier trend for high-quality, sustainable buildings is being pushed by a number of large Dutch corporates and has implications well beyond the country's borders. Examples are: Unibail-Rodamco (Europe's largest listed property company) announcing a carbon reduction target of 50% from 2016 to 2030; PGGM (one of the ten largest pension funds in the world) requiring a carbon reduction target for its investments of 50% between 2015 and 2020; and Unilever (one of the world's largest consumer goods companies) has made "making sustainable living commonplace" their purpose as a business, and associated with that is a goal to halve their environmental footprint by 2030.

Professional services are another group of occupiers that have made their mark on the office market. In 2016, Deloitte moved to an office building called The Edge in Amsterdam's prime South Axis office node, which has been called "the greenest building in the world." Ratings agency BREEAM gave it the highest score ever awarded—thereby helping to boost Deloitte's green image. The flipside of this move, however, has been equally well publicized since the company left behind 20,000 square meters of office space elsewhere in the same market.

In 2010, KMPG moved to the largest office building in the country, seeking sustainable, flexible office space. At the time it left behind a moderately smaller building just 100 meters away, but more recently, the company has complained that the current building does not meet its needs. These two examples are illustrative of how the demand for sustainable office space on a corporate level can be detrimental on a market level: municipalities are keen to approve the new construction of green buildings, but most occupiers leave behind older space elsewhere, which in terms of energy embodied in the construction and building materials will be much greater than the savings on the new building.

While it is easier for large occupiers to address corporate values of sustainability through their accommodation needs, simply because they have the bargaining power with landlords and developers, smaller businesses are following suit—if not quite to the same extent. When managing our office portfolio in the Netherlands, we see a noticeable trend that occupiers are becoming more open to receiving rental incentives in the form of sustainability measures. Incentive packages are commonly around 20% of the headline office rent in the Netherlands, so when rent-free periods can be replaced by investments towards the sustainability of the building, this altogether is preferable to the landlord.

Investors' Perspective

In 2009, the lack of clear sustainability data on investments or funds led a number of investors, spearheaded by the largest Dutch pension funds APG and PGGM, to commission Nils Kok at the University of Maastricht to conduct a survey. The intention was to create an overview of the level of integration of environmental management in listed property companies and private property funds across the globe. From this survey the GRESB was developed. GRESB continues to operate as a private limited company incorporated in the Netherlands, but is now a wholly-owned subsidiary of Green Business Certification Inc., the non-profit organization associated with the U.S. Green Building Council. Despite its global reach, Dutch investors remain some of the more vocal and progressive members of the GRESB—continuously pushing to raise the bar and tighten the accountability of sustainability measures in real estate.

Within Dutch pension funds, which are among the world's most prolific institutional real estate investors, nearly all schemes have an ESG policy. However, in practice, every pension fund emphasizes a different part of the ESG agenda. In order to improve the coordination and exchange of expertise between pension funds, the Dutch Pensions Federation is now planning to draw up a covenant which should result in shared definitions and standards. There are 70 pension funds, representing 84% of Dutch schemes' assets, which have already signed the declaration of intent for the covenant. Such an initiative is indicative of the high level of integration of sustainability concerns with Dutch investors.



Germany

Sustainability is playing an increasingly important role in the German real estate industry: on the building level through certification, and on the company level through corporate sustainability reporting. However, while Germany as a country is the most ambitious in Europe in terms of its renewable energy agenda, the legal and tax specificities make it more challenging to implement green measures compared to most other countries in Europe. In order to meet its carbon reduction targets, more stringent regulations are likely to be introduced in the near future.

National Specifics

Certification. The most widely used certification in Germany is awarded by the German Sustainable Building Council (DGNB). It operates a voluntary system where the quality of the building is assessed based on 50 sustainability criteria, including ecology, economy and socio-cultural aspects. The system is based on outperforming current thresholds, which will lead to a bronze, silver or gold certificate. While the DGNB label is the market leader, their share of all certificates awarded in the German market is decreasing. In terms of certification of new buildings, DGNB has a market share of 80%; but for the certification of existing buildings, BREEAM now has provided more than half of all certificates.

Carbon reduction targets. Since Germany historically has been one of the largest CO₂ emitters in Europe, the German government has set itself some of the most ambitious carbon reduction targets of all European countries. Carbon emissions are to be reduced by 40% by 2020, by 55% by 2030 and by 80% by 2050. However, meeting these targets appears to be very challenging, as current performance standards are already high. The existing energy savings law (ENEV 2016) defines high thresholds for primary energy consumption of new buildings as well as minimum standards for existing buildings. A new building energy law (GEG) is currently being debated by the federal government which will further raise the existing benchmarks for energy performance, impacting not only new buildings but also existing stock. The discussion about GEG has been deferred to until after the September 2017 elections and much can still be changed. It is clear that in order to meet the targets set at both EU and national levels, the demands on the energy status of the building stock will certainly be tightened considerably in the coming years. LaSalle therefore pre-empts future energy reduction measures in its asset-level business plans.

Occupiers' Perspective

When it comes to improving energy standards of building stock, German real estate market suffers from the "split-incentives" dilemma. Generally speaking, costs for refurbishment and energy upgrades usually cannot be recovered from commercial tenants. Furthermore, tenants' electricity consumption is usually not managed by landlords, and tenants have no obligation to disclose them. Compared to other major European countries, the potential economic advantages of owners and property users working together on green issues is still given little consideration in Germany. Green leases are not very common and there is no mandatory requirement under German law to include green clauses.

The main consideration for landlords remains whether a building meets legal requirements and has been (or will be) constructed as a "green building," which may then lead to certain obligations toward the tenants to comply with the requirements of the relevant environmental certificate. The intention to obtain an environmental certification can also be a reason to negotiate green lease provisions into existing leases. In this environment, energy audits carried out on the building stock play an important role. These energy audits include a significant amount of data compilation leading to possibilities to optimize the cost and consumption of energy in the building.

Investors' Perspective

Given all this, it is unsurprising that many German real estate investors and investment managers are still struggling to capture comprehensive sustainability data on their portfolios. A step in the right direction was made in 2016 with the real estate companies within the German Investment and Asset Management Association (BVI) adopting specific guidelines for sustainable real estate portfolio management. Publication of these guidelines, which cover social, environmental and economic aspects at a portfolio level, means that recommendations for assessing sustainability at a portfolio level are now available for the first time. For BVI, the aim is to understand and compare the methods used to assess sustainability aspects of property portfolios, and the guidelines remain high level. Therefore, while taking note of the industry guidelines, LaSalle is reaching further and has enrolled its LaSalle E-REGI open-ended fund in GRESB. The fund is targeted at German investors with the aim of becoming one of the early Green Star funds in the space.

In the listed space, German real estate companies have adopted sustainability reporting. However, among the nine most important German listed real estate investment companies, only four publish separate sustainability reports which apply international standards. The other firms either report on sustainability voluntarily in different sections of their annual report and/or mandatory management report or even not at all. A striking observation is also that the residential companies which are a powerful part of the German listed market are lagging behind compared to commercial real estate companies—and especially the office specialists. Clearly, as tenants and potential investors in the office sector are more sensitive to sustainability than those in the residential sector, German listed office companies are more willing to adopt transparent sustainable reporting than their residential peers.

Asia-Pacific



Australia



Australia is global leader in sustainable building and has topped the GRESB global ratings since the survey's inception. Energy initiatives in the office sector are particularly widespread and are now the standard²² rather than the exception. The focus is now shifting well beyond energy towards broader environmental impacts and onto indoor environmental quality as well as tenant well-being.

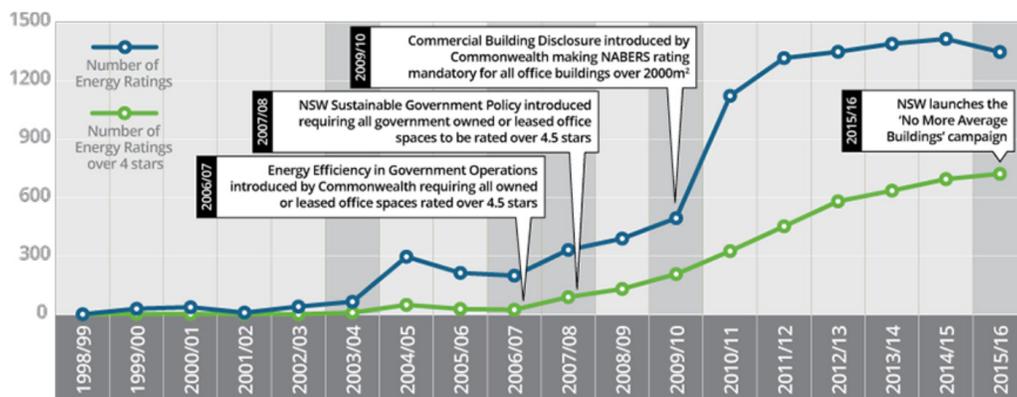
National Specifics

Certification. There are two main local rating systems. The NABERS rating system (National Australian Built Environment Rating System) started primarily as an

energy efficiency rating system, but has expanded to include separate ratings including water usage, waste management and indoor environment. Ratings can be on the basis of base building, tenancy or whole building (including base building and tenancy). The Green Star rating initially started primarily as a development rating tool, but has broadened over time and moved towards providing ongoing performance rating measures, plus ratings on building interiors and for master-planned communities. Both the NABERS and Green Star rating systems now have indoor environment quality (IEQ) ratings and the 2015/16 NABERS annual report noted a 40% year-on-year increase its IEQ ratings. Green Star has now also introduced a rating tool for master-planned communities.

Public sector initiatives. The rise of sustainability in Australia has undoubtedly been attributable to a mix of public sector initiatives, as well as a strong underlying corporate alignment to CSR objectives among major owners/developers and occupiers. Before 2008, federal and state governments had already introduced minimum sustainability standards for government leases, but the biggest regulatory impact was the introduction of mandatory disclosure legislation in November 2010. This required a NABERS energy rating to be included in any sale or leasing marketing material for any office building over 2,000 square meters, resulting in a significant spike in ratings in 2010/11 (see Figure 5). Another public initiative to support sustainability is the Clean Energy Finance Corporation (CEFC), which is a government-owned green fund set up to provide financing or equity to individual projects or funds provided certain sustainability objectives are met.

Figure 5: Number of Buildings and Tenants with NABERS Office Energy Ratings Certified



Source: NABERS Annual Report 2015/16

²² NABERS estimate that 82% of monitored office stock has now been rated at least once.

Occupiers' Perspective

Health and Wellness has become a major focus of corporate and real estate strategy for major office occupiers, and thus a major focus of landlords and developers. This has seen the global WELL Building Standard gain quick traction in Australia, and a number of building owners/developers such as Macquarie Bank, Grocon, Mirvac, Dexu, Lendlease and Frasers Property all seeking to gain certification for buildings. The WELL Buildings Standard allows base building certification for the physical aspects of the standard²³, but also includes a tenancy rating that drills down into softer criteria that the tenant implements to encourage worker well-being (including policies and procedures to support work/life balance, mental health, nutrition and fitness). As such, the standard is complementary to other environmental ratings. An increasing number of corporates are supportive of this approach as the evidence that providing a desirable, sustainable workplace leads to greater productivity is growing. For example, a 2014 report found that for every \$1.00 spent on better work practices, there was a \$2.30 return²⁴.

Another important recent development has been the rise of NABERS "commitment agreements" (i.e., contracts between a building's stakeholders) that aim to align the interests of the parties to achieve measured sustainability outcomes over a continuous 12-month period and bridge the gap between design and performance metrics.

Investors' Perspective

The proliferation of sustainability initiatives in Australian prime office stock means that new sustainability initiatives generally are regarded more as a defensive attribute than a differentiator. This creates a problem for owners of older non-sustainable stock, which is evident in the performance differential that has emerged between low-rated secondary stock and the rest of the market²⁵. While this data does not fully account for other drivers of performance differentials, it does lend some support to the proposition that capital growth has been stronger for green office stock.

For investors, this creates an opportunity to reposition the older buildings with the right features to meet the basic sustainability criteria expected in the market and to provide tenant facilities that are

now commonly expected. LaSalle has followed this strategy in repositioning and re-leasing an office building at 179 Elizabeth Street in Sydney, where all possible environmental upgrades were mapped out. Eventually the strategy focused on initiatives with a shorter pay-back time, which lifted the building from a 2-star to a 4-star NABERS rating over a five-year investment hold.

In order to attract major occupiers and develop a truly "core" investment product, delivering the very highest level of sustainability is imperative. For example, LaSalle participated in a joint venture on the development of the 6-star Green Star design rated 167 Castlereagh Street in Sydney that reached full occupancy in 2013 in a challenging leasing environment. The project also included the renovation of an existing historic building at 161 Castlereagh Street that utilized a number of innovative recycling initiatives to become Sydney's first carbon neutral building and to win a Property Council of Australia award for Best Environmental Project.



Japan

Sustainable features in Japanese buildings lag many other countries. Occupiers, developers, and investors have prioritized profitability before sustainability. However, the government is under much pressure to address this issue, having signed on to the global energy reduction target in the 2015 Paris Agreement. It is now likely that the government has to implement more regulations and subsidies focused on sustainability, targeting various real estate players across property sectors.

National Specifics

Greenhouse gas reduction targets. While progress is being made, the pace of reduction in greenhouse gas (GHG) emissions so far has been far too low²⁶ to meet the target of a 26% reduction of 2013 levels by 2030 which the Japanese government committed to by signing the Paris Agreement. Due to the large gap between the GHG reduction target and current consumption, it is now likely that the government will enforce a legal scheme on energy consumption.

Certification. There are a few domestic green building certifications used in the market, such as "DBJ Green Building Certification" (by Development Bank of Japan and Japan Real Estate Institute) and "CASBEE"

²³ Such as air quality, light, water use, factors that encourage physical activity like 'end of trip' cycling facilities, internal stairs and green spaces.

²⁴ PWC, 'Creating a mentally healthy workplace: Return on investment analysis', March 2014

²⁵ See the MSCI PCA/IPD Australian Green Property Digest.

(led by the Ministry of Land, Infrastructure, Transport and Tourism), as well as internationally recognized ones like LEED. Out of these certifications, DBJ GB Certification is most commonly used among developers and J-REIT investors today.

Disaster risk mitigation. Another critical part of earthquake-ridden Japan's sustainability agenda is disaster risk mitigation and business continuity planning (BCP). Generally, functions such as the degree of earthquake resistance and in-house power generation systems are assessed in green building certifications. However, our experience is that the costs for this risk mitigation are not fully priced into real estate values. When the Tohoku Earthquake and the following power shortage occurred in 2011, both tenants and investors were concerned. The high probability of severe earthquakes in Japan may intensify the need for BCP functions, resulting in a price hike or an increase in tenant demand. We expect this to mostly affect the office sector, as it directly relates to corporates' revenues, but also potentially the apartment sector.

Occupiers' Perspective

As elsewhere, there are some Japanese corporates who prefer to be located in green buildings in order to achieve their CSR objectives. However, most occupiers feel little urgency to pay more for more sustainable office space. Currently there are no national regulations in place for tenants to work towards energy reduction targets. Only a few local governments have set requirements for large office tenants on energy usage, but these tend to be loosely defined.

Under government pressure, developers are only gradually implementing green building standards. A new regulation enacted in April 2017 requires any commercial building with GFA of 2,000+ square meters to comply with specific energy efficiency criteria in order to receive a construction permit²⁷. The government is also encouraging industry associations, such as the Real Estate Companies Association of Japan, a nationwide association of developers, to set energy-reduction targets in

line with the country's commitment to the Paris Agreement. The Building Energy Labeling System (BELS), introduced in 2014, provides an energy benchmarking system for real estate.

Investors' Perspective

Historical performance of J-REITs' offices shows that green building functions lead to higher rental levels, especially among small to medium sized buildings. A 2016 study found that the rental level of green buildings was 11% higher for small to medium sized offices than for non-green buildings of a similar size, while there were no rental premiums for large buildings²⁸. We believe this is because most large offices are already high-spec and consequently have green features without being "green" certified.

In the future, the rental premium of green building features could increase if government requirements on tenants and landlords are tightened, especially for small- to medium-sized buildings. GHG emission and disaster risk mitigation are two major green building functions which are likely to see the greatest tightening of requirements. By selecting buildings with these two functions today, investors are likely to benefit from reinforced defensiveness of rental income and mitigated risk of obsolescence in the longer term.

In Japan, LaSalle has developed a number of warehouses with both disaster risk mitigation and energy conservation features. For example, "Logiport Hashimoto", a multi-tenant warehouse completed in 2015, has a base-isolation structure²⁹. The asset also has a solar power generation system on its roof. It received the highest rank of DBJ GB Certification and is currently managed as part of the LaSalle Logiport REIT for a long-term investment hold.

²⁶ Energy consumption within office buildings has decreased by only -2.7% since 2011, according to a report by Xymax.

²⁷ Improvement of Energy Consumption Performance of Buildings Act.

²⁸ Japan Real Estate Institute (2016). Analysis was done with a hedonic regression model. Dummy variables include location, grade, public transportation access, building age, GFA, NLA and floor plates.

²⁹ Highest level of earthquake-resistant structure.

North America



United States



The US is both a leader and laggard in incorporating environmental sustainability into real estate investment. The US approach to sustainability emphasizes discretionary participation, focuses on building level measurement and improvement, and allows market forces to drive behavior rather than regulation. Overall, while the recent national policy environment may keep the US from becoming a global leader in environmental sustainability, significant progress and innovation will still be found at the municipal level or within privately-financed projects.

National Specifics

Certification. The US was a pioneer in the development of a sustainable building rating system (the US Green Building Council's LEED system), which has been widely adopted by the commercial real estate industry. The US Environmental Protection Agency's Energy Star program has established an industry standard to measure energy and water use by creating building performance scores. It encourages energy savings and innovation driven by free-market demand, not through federal regulations or mandates.

Regulation. There remains an ongoing political debate in the US regarding the scientific consensus that global climate change is occurring and is caused by human activity; this creates challenges to implementing national regulations. Local policy initiatives, however, are important and do heavily impact the regulatory landscape in the US, thereby impacting real estate owners and investors. For example, the NRDC/IMT City Energy Project is leading an effort to create city-level building energy reporting requirements; these ordinances leverage the Energy Star program. IMT reports that 24 cities have adopted such policies, with these cities combined representing a remarkable 92% of the asset value in the NCREIF NPI CBD Office universe. The concentration of other property types in major cities would be less, but still local reporting regulations are impacting most, if not all, institutional real estate investors.

Occupiers' Perspective

The biggest push for sustainability in the US comes from occupiers. Many large occupiers have top-down sustainability objectives dictated by corporate

initiatives, such as responding to CDP (formerly the "Carbon Disclosure Project") which now counts \$35 trillion dollars of companies as measured by market cap as disclosing energy-related data. For these companies, real estate-related policies often flow from corporate level objectives.

For example, as mentioned earlier, Dutch corporate Unilever has made "making sustainable living commonplace" their purpose as a business, and associated with that is a goal to halve their environmental footprint by 2030. For Unilever, this impacts their accommodation needs with a mandate to only occupy LEED buildings, and as such they have been a leader in driving LEED adoption for warehouse buildings. Other companies have similar (if not as bold) objectives, which is becoming a strong market force on building owners across property types to invest in sustainability.

Investors' Perspective

There is diversity in investor attitudes. The nation's largest state pension fund, CalPERS, has made manager environmental reporting a priority, and the Texas Teachers Retirement System is a GRESB member (albeit the only US investor member). However, most US investors do not prioritize environmental factors in asset or manager selection. In the listed space, most US real estate companies have adopted sustainability reporting. Among the 10 largest US real estate securities companies as measured by market cap, eight publish a separate sustainability report. According to GRESB, 15 of the top 20 REITs in the US participated in the 2015 GRESB survey.

As climate change is directly impacting certain locations, this is starting to be reflected in capital investments and valuations. For example, 2012 Superstorm Sandy caused severe flooding in Lower Manhattan, which led to investment in building resilience. Flooding is also becoming more regular in Miami, which is causing some investors to re-think their approach to the market.

LaSalle has successfully implemented sustainability initiatives at both the asset and fund level in the US. An example at the asset level is an exterior lighting project at Miami Tower, where replacement LED lights are creating new branding opportunities and providing a \$250,000/year expense savings. At the fund level, LaSalle Property Fund—a US institutional core open-end fund—has responded to GRESB since 2013, increasing its score by 17 points over four reporting years to achieve its first Green Star rating, making it one of a limited number of funds in the ODCE index to achieve this recognition. Investors, especially those from overseas, have responded favorably.



Canada

Canada's real estate investors rank among the world's leaders with respect to environmental sustainability initiatives. While Canada's large institutional investors have been the primary drivers of the sustainability agenda within Canada's real estate sector, smaller property owners and investors are active participants as well.

National Specifics

Regulation. Canada signed the Copenhagen Accord in 2009, thereby committing the country to reduce greenhouse gas emissions to 17% below 2005 levels by 2020, and was a party to the Paris Climate Agreement in 2016. Canada's environmental progress is monitored federally, provincially and locally. Alberta, Ontario and Quebec have implemented carbon taxes in recent years, while the federal government is likely to implement the same across the country in 2018 for provinces who do not have their own system in place by then.

Energy reduction targets for office buildings. In 2009, REALPAC, the Building Owners and Managers Association (BOMA) and the Canada Green Building Council jointly announced a 2015 target for energy consumption in Canadian office buildings. The target was to reduce energy consumption to 20 equivalent kilowatt hours (eKWH) per square foot (psf) per year—normalized for vacancy, heavy energy uses, weather and occupancy levels, among other factors. By 2015, leading buildings in Canada were in the range of 8.0 eKWH psf per year (fully normalized), but there are outliers with buildings consuming over 100 eKWH psf per year, so the range remains wide.

Certification. The Canada Green Building Council's LEED certification system mirrors that devised by the US Green Building Council and is widely used by commercial property owners across the country. At the asset level, LEED designation has been ubiquitous among institutional-grade investment real estate in Canada for nearly 15 years. In 2016, there were roughly 5,800 LEED registered and certified property projects in the country—the second largest total in the world after the US.

Evidence of green premium. MSCI's REALPAC/IPD Canada Quarterly Property Index has an associated Green Property Index—in which properties must have a BOMA or LEED rating. The Green Index is

comprised of 534 assets totaling \$67.3 billion in capital value (accounting for 22% of the properties and 49% of the value, respectively, of the main Index). Green Index properties have had consistently higher net income psf and generally lower vacancy compared to properties in the main Index. However, the shorter history of the Green Index (since 2013 compared to 1985 for the main Index) remains an issue, and its relative total return performance compared to the main Index is negligible. While the Green Index slightly outperformed the main index since its inception, in 2016 it underperformed by a fraction. It therefore remains difficult to separate the impacts of building quality and location.

Occupiers' Perspective

Markets like Ottawa and Edmonton, where the public sector is a major tenant, are prime examples of tenant demand driving and influencing market behavior. In 2012, Canada's federal government introduced the Workplace 2.0 program for all of its leased premises, enticing private sector landlords to pursue sustainability certifications to ensure inclusion on the government's preferred list of properties for leased accommodation. By exclusively leasing space in Energy Star-rated buildings with high percentile rankings, or properties with a high sustainability certification, the federal government is aiming to have a carbon neutral property portfolio by the year 2030.

To date, LaSalle Canada has adopted an asset-level approach to sustainability. Its portfolio of core and core-plus office properties have all been LEED certified, with the majority at the Gold level. As an early adopter, LaSalle Canada certified its first LEED asset in 2010 and has since certified an additional nine office assets in its portfolio.

Investors' Perspective

While carbon reduction and sustainability have become key government initiatives, the real estate sector in Canada has been ahead of the curve for several years. With 16 companies and funds in Canada participating in GRESB, Canada ranks ahead of both the US and the overall global GRESB benchmark. Three of Canada's institutional investors are either North American or Global sector leaders in the GRESB rankings. The soon-to-be-launched LaSalle Canada Fund is currently being considered, in consultation with LaSalle's Chief Sustainability Officer, for submission to GRESB.

APPENDIX B: Literature Review

The literature regarding the impact of real estate on the broader environment and how to improve a building's sustainability performance has grown tremendously in recent years. Hard data on the "green premium" has now been collected and verified across a number of countries from credible academic researchers. At international real estate gatherings, the need for consistency across various country rating systems for green buildings has been identified as a source of potential improvement. Several of the leading international real estate services and legal firms have helped educate investors and occupiers, who are often overwhelmed by all the different standards. More recently, a broader literature that describe how sustainability fits into a broad ESG framework has emerged. The literature on climate change and resiliency is growing rapidly, as these concepts apply to both buildings and entire cities. Listed below are some of the articles and publications that we recommend for further reading. The websites that provide constantly updated information on all these topics is included at the end of this bibliography.

General Industry Reports on Sustainability

- Baker & McKenzie (2015). Global Sustainable Buildings Index
- JLL (2014). 3.5% - the path to 2050?
- JLL (2017). 2017 Sustainability trends for the property sector
- JLL/LaSalle (2016). Global Real Estate Transparency Index
- US Green Building Council (2015). The Business Case for Green Building
- Pension Real Estate Association (2018). A Primer on Sustainability in Real Estate

Sustainability Benchmarks

- Carbon Disclosure Project (CDP)
- EPRA/JLL (2016). Surging Ahead, EPRA Sustainability Global Reporting Initiative (GRI)
- GRESB. Global Real Estate Sustainability Benchmark
- Sustainability Accounting Standards Board (SASB)
- Urban Land Institute Greenprint
- World Green Building Council (2013). The Business Case for Green Building: A Review of Costs and Benefits for Developers, Investors and Occupants.

Understanding Certification

- Bannister P., NABERS (2013). Lessons from 12 Years of Performance Based Ratings in Australia
- Parker J., (2012). The Value of BREEAM
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APPENDIX C: Well-Established Certification and Rating Systems for Sustainability

GRESB (Global Real Estate Sustainability Benchmark)—A global fund level benchmark that requires an annual assessment on the ESG performance and best practices of real estate portfolios (standing and in-development), real estate debt, and infrastructure. Annual submissions receive a GRESB score that is compared against peers in the same property type for real estate, sector for infrastructure, and by region.

BREEAM (BRE Environmental Assessment Methodology)—A building level sustainability certification deriving from the BRE (Building Research Establishment). Although this originates in the UK, it has gained wide traction across Europe and Asia, and over 2.2 million buildings have been assessed since 1990. The assessment covers new construction, refurbishment and in-use buildings.

LEED (Leadership in Energy and Environmental Design)—A building-level sustainability certification developed by the US Green Building Council. It includes a set of ratings systems for the design, construction, operation, and management of buildings to help developers, owners, and operators manage the environmental impacts and human benefits of real estate. Largely popular in the US, the certification system has gained much global popularity.

NABERS and **GREEN STAR** are two Australian local rating systems. The NABERS rating system (National Australian Built Environment Rating System) is administered by the NSW Office of Environment and Heritage. NABERS started as an energy efficiency rating system, but has expanded to include water usage, waste management and indoor environment. Ratings can be on the basis of base building, tenancy or whole building (including base building and tenancy). The 'Green Star' system is administered by the Green Building Council of Australia and initially was a development rating tool, which rated buildings across broad sustainability criteria including energy, water, waste and overall environmental impact. However, Green Star has broadened over time and has moved towards providing ongoing performance rating measures, plus ratings on building interiors and for master-planned communities. Both systems are voluntary and more than 80% of all buildings in Australia have been rated by one of the two systems.

ENERGY STAR (for buildings & tenants)—Administered by the US Environmental Protection Agency, the Energy Star 1-100 rating for buildings is available to select property types in the US and Canada by benchmarking energy consumption data in the Portfolio Manager tool, revealing how a building's energy consumption compares to that of other similar buildings of the same space type, based on a national average. Energy Star performance ratings are incorporated into the LEED Operations & Maintenance rating system. The Trump Administration has proposed cutting the federal funding for this program.

APPENDIX D: LaSalle note on Capturing the Green Premium, October 2017

In June 2017 LaSalle published a white paper entitled *Environmental Factors & Real Estate Demand: Secular Drivers of Real Estate*. Our report makes the case for adding environmental factors to the “DTU”¹ secular drivers of real estate demand we identified seven years ago and have continuously explored since then.

One section drew particular attention from the press and our clients: “A Risk Premium Approach to the Pricing of Green Buildings”. IPE Real Estate recently reported on our paper with a thought-provoking headline: “Should Investors Accept a 65bps Lower Return for Green Buildings?”². The article drew strong attention from the investor community (particularly in Europe) about the ways in which E-performance could be integrated with financial performance.

This short note makes sure that our findings are clear and that our clients understand the insights but also the limitations of our approach. One section of the white paper presents investors with a risk premium decomposition model that focuses on the relative pricing of various green building features (see page 12). This model is a useful template for estimating the required risk premiums and hence required returns for green versus non-green buildings.

Over the past eight years statistical evidence has demonstrated that green buildings not only have lower energy consumption and hence operational costs, but their design and features improve their attractiveness to occupiers. These features enhance green buildings’ occupancy and achieved rents which in turn leads to increases in their financial performance and raises the value of the building.

The LaSalle E-factor framework is designed to reflect the growing statistical evidence that shows how well green buildings tend to perform in terms of (re) leasing speed, rents achieved, liquidity, obsolescence, debt financing, and capital market pricing. It then quantifies these features in terms of estimates of higher projected returns (if no price differences are observed for green vs. non-green buildings) and a lower risk premium required by investors and hence a lower required return (when the pricing of green buildings rises to reflect improved performance).

We believe such a framework is useful because it attempts to compare green and nongreen buildings on a risk-adjusted basis. The analysis is not a formula that investors should apply “everywhere and always”. Indeed, the analysis is representative of relatively few

countries today and is largely a hypothetical analysis. It reflects more of a European real estate context (based on empirical reports primarily from Western Europe), and is also applicable in major markets in Australia and Canada. This financial framework does not yet apply equally in other markets and it is accurate to note that a price premium for green buildings will vary by country and by type of building as well as by metro.

In conclusion, the evidence of a price premium for green buildings (due to lower risk profile and leading to lower required returns) is not yet evident in major markets everywhere. LaSalle expects that the trend over time is that this premium will become more common in the future. This forward-looking view gives rise to actionable strategies in many countries, inside and outside Europe. We believe that an investor should expect higher risk-adjusted returns from a green building due to a lower risk of obsolescence, higher tenant retention, and lower operating costs for both tenants and landlords.

There are two ways an investor can design actionable strategies based on our findings:

1. Earn the premium by converting a non-green building to one that is fully-credentialed and lowers CO2 emissions and water usage (for example).
2. Invest in green assets when the yield differential return between non-green and green is negligible (i.e. much less than the hypothetical example of 65 basis points).

For example, if two similar buildings in, say, Amsterdam are on the market each priced at a 5% yield, the one with the strongest green credentials most likely represents better value (assuming most other attributes such as location and rent roll are nearly the same). As the capital markets begin to acknowledge the value of these green buildings in various markets, green building yields should fall relative to the rest of the market.

LaSalle’s analysis suggests that the lower yield can still represent fair value (even if it is up to 50-65 bps lower required total return) in circumstances where green attributes are (or soon will be) held in high regard by tenants, lenders and eventually investors.

¹DTU: Demographics, Technology and Urbanisation.

² “Should Investors Accept a 65bps Lower Return for Green Buildings?”, Rachel Fixen, IPE Real Estate, July 31, 2017; transportation access, building age, GFA, NLA and floor plates. ²⁹ Highest level of earthquake-resistant structure.

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