March 2023

Investing for Sustainability:
Real Estate

CONTENTS

Executive Summary

As environmental, social and governance (ESG) investing has gone mainstream, the world's largest and most sophisticated institutional investors are expanding their usage of ESG criteria across asset classes. Real estate has yet to receive the level of attention of other asset classes. However, given the substantial role of buildings in our lives and those of the companies that own, manage and occupy them, real estate is a major part of the sustainability challenge, and a major economic opportunity as well.

This paper discusses the opportunity for investing in sustainable real estate and puts forward a strategy to do so:

Section 1. Introduction. We identify the need for a publicly-traded real estate fund that integrates sustainable criteria.

Section 2. The Case for Sustainable Buildings. This section summarizes the opportunities available to make buildings more sustainable and the financial implications of doing so.

Section 3. The Opportunities for REITs. We describe the important role real estate investment trusts (REITs) play in the built environment and in investment portfolios.

Section 4. Defining the Metrics of Sustainability in Real Estate. There are many ways to define sustainability. We compare how different stakeholders prioritize different factors. We then list metrics that are most material to the performance of real estate assets, and most important to investors.

Section 5. A Strategy for Investing in Sustainable REITs. We set out a methodology for a real estate strategy. We define the metrics and the security selection criteria for qualification and disqualification from the portfolio.

1. INTRODUCTION

DEFINITION: TBL and ESG

Companies concerned with operating sustainably focus on more than just the bottom line. In 1994, John Elkington coined the term **Triple Bottom Line** to distinguish firms focusing on people and planet as well as profits. Sometimes shortened to 3P (people, profit, planet), but more often to **TBL**, it is shorthand for sustainability from a company's perspective.*

Investors approach sustainability from an **ESG** perspective; they monitor the **environmental, social, and governance** performance of firms, in addition to the financial performance.

"Investing for Sustainability" could mean different things to different people. It is not synonymous with "ethical" or "socially responsible" investing, though they certainly share common ground, especially when it comes to considering people and planet. Vert defines it as going beyond the traditional financial-only metrics of security analysis by incorporating Environmental, Social, and Governance factors or ESG.

Some investors are moving beyond a single-minded focus on company financials. They worry that a profit-only focus is short-sighted because it neglects to consider longer term risks. They want to factor in the environmental and social risks and opportunities that companies face because these factors may impact their bottom line, now or in the future. Some investors also wonder how their investment capital will be used by companies and wish that no unnecessary harm is done to people or the planet. Others see the potential for improving profits as companies take advantage of the shift to a more sustainable way of operating. Many of these investors have turned to ESG investing.[1] Today, ESG criteria are considered for $8.4 trillion in professionally managed assets in the US alone.[2] It is no longer a niche

* The 'Triple Bottom Line' phrase originated in 1994 with John Elkington, a member of Vert's Advisory Board. Elkington, J. (1994, January 1) "Towards the Sustainable Corporation: Win-Win-Win Business Strategies for Sustainable Development", *California Management Review*, vol. 36, 2: 90-100.

[1] OECD (n.d.), "Environment, Social and Governance (ESG) Investing." Retrieved on 10/16/2022 from https://www.oecd.org/daf/fin/financial-markets/esg-investing.htm.

[2] The Forum for Sustainable, Responsible and Impact Investing (USSIF) (2022). "2022 Trends Report Highlights." Retrieved on 10/16/2022 from: https://www.ussif.org/currentandpast

approach, but rather one adopted by many of the world's largest and most sophisticated institutional investors.

ESG investing has gone mainstream

More investment strategies taking an ESG approach have become available to the individual investor. Today, investors can own dozens of ESG mutual funds, ETFs, and index funds in asset classes like large cap equity. However, other asset classes, like real estate, have been largely overlooked. At first glance this makes sense, as investors usually place only 5-10% of their liquid investable assets in real estate. *Yet, in 2021 a full third of all global CO_2 emissions came from real estate.*[3] It also plays a key role in other important issues such as water pollution and conservation, biodiversity, public health and safety, cultural preservation, affordable housing, urban revitalization, and livable neighborhoods. And the real estate industry is well behind other sectors when it comes to diversity, equity, and inclusion.[4] Thus, real estate is a major part of the ESG/sustainability challenge, and a major opportunity as well.

Real estate is both a sustainability challenge and an opportunity

Buildings are a challenge to green objectives because they use large quantities of energy, water, and material resources. But they also present an opportunity, as the World Resources Institute noted in 2017:

"The environmental impact of the built environment can be minimized with energy efficient buildings, as well as with environmentally sound siting decisions, materials selection, water use, and waste management. In addition, energy efficient buildings contribute to better indoor and outdoor air quality through reduced pollution and improved ventilation, leading to health and economic benefits."[5]

Such benefits present business and investment opportunities. For example, property owners and tenants have ample scope to profit from energy efficiency retrofits and building improvements. Reducing energy use reduces costs. And energy efficient buildings command higher rents, are worth more,

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[3] IEA (2022), Buildings, IEA, Paris https://www.iea.org/reports/buildings. Note that operating buildings accounted for 27% of total global emissions, and 6% more came from making cement, steel, and aluminum for building construction.

[4] Jordan, K. (February 4, 2022), "Tracking Progress on Diversity, Equity, and Inclusion in Commercial Real Estate," Urban Land, Urban Land Institute, available at https://urbanland.uli.org/inside-uli/tracking-progress-on-diversity-equality-and-inclusion-in-commercial-real-estate/.

[5] World Resources Institute (2017). *Accelerating Building Efficiency: Eight Actions for Urban Leaders.* Retrieved from: http://publications.wri.org/buildingefficiency/

and are less prone to mortgage defaults.[6] Similar opportunities exist in many other areas as well, ranging from water conservation, walkability, and quality architectural design to healthy buildings, fair labor practices, historic preservation, and community development, to name just a few.[7] The investment case is straightforward: companies taking advantage of opportunities to improve how buildings perform across the triple bottom line can and do profit handsomely.

2. THE CASE FOR SUSTAINABLE BUILDINGS

The built environment is all around us: it accounts for the buildings we inhabit, the roads we use, the squares and sidewalks we stroll on, the recreational areas we enjoy – everything that makes up our landscape, how it interacts with the natural environment, and how it shapes our daily lives. In fact, 9 of the 17 UN Sustainable Development Goals, our "shared blueprint for peace and prosperity," depend on how we build, according to the World Green Building Council:

Source: World Green Building Council

[6] Coleman, P., Deason, J. and Mathew, P. (2017, October). *CRE Literature Survey*. Presentation delivered at the Lawrence Berkeley Lab and US Department of Energy Research Workshop, University of North Carolina, Chapel Hill.

[7] Pivo, Gary, and U. N. Environment Programme Finance Initiative Property Working Group. "Responsible property investing: what the leaders are doing." Journal of Property Investment & Finance 26.6 (2008): 562-576. Also see https://www.unepfi.org/fileadmin/documents/ceo_briefing_property_01.pdf; https://www.unepfi.org/fileadmin/documents/responsible_property_investing_01.pdf; and https://www.unepfi.org/fileadmin/documents/Responsible_Property_Investment_2_01.pdf.

This idea that real estate has the potential to help create a better future (and a better today) is not new. For example, University of Wisconsin Professor James Graaskamp, a pioneer of modern real estate education, said, in 1998:

"Man really is the only animal that builds his terrarium around him as he goes and real estate is really the business of building that terrarium. So we have a tremendous ethical content, tremendous social purpose…It is a field in which entrepreneurship…can be integrated into social purpose…The entrepreneur of tomorrow is going to be the individual who can inventively implement social policy."[8]

2.1 The Environmental Opportunity for Buildings

Buildings are a major component of the built environment, particularly our stock of office, residential, retail, and industrial spaces; all of which play a major role in sustainability. Constructing and operating buildings consume large amounts of energy, water, and materials. It can also displace natural areas, disrupt neighborhoods, and emit pollutants to the land, air, and water.

There is great potential to improve the performance of buildings around sustainability issues and many leading organizations are encouraging the real estate sector to embrace the opportunities. For example, as of January 2022, the UN supported Principles for Responsible Investment – an investor initiative in partnership with the UNEP Finance Initiative (UNEP FI) and the UN Global Compact – will be carrying forward the work of the UNEP FI Property Working Group (PWG). The PWG was a longstanding investor program of UNEP FI comprised of leading asset owners and managers focused on driving financial returns through ESG integration. As they explain:

"…e*vidence shows that more efficient "greener" properties incur lower operating expenses, support efforts to achieve top of market rents, have fewer vacancy and void periods, are at lower risk of mortgage default and meet the increasing needs of occupiers to provide living and working space that helps to improve employee engagement, health, and productivity."*[9]

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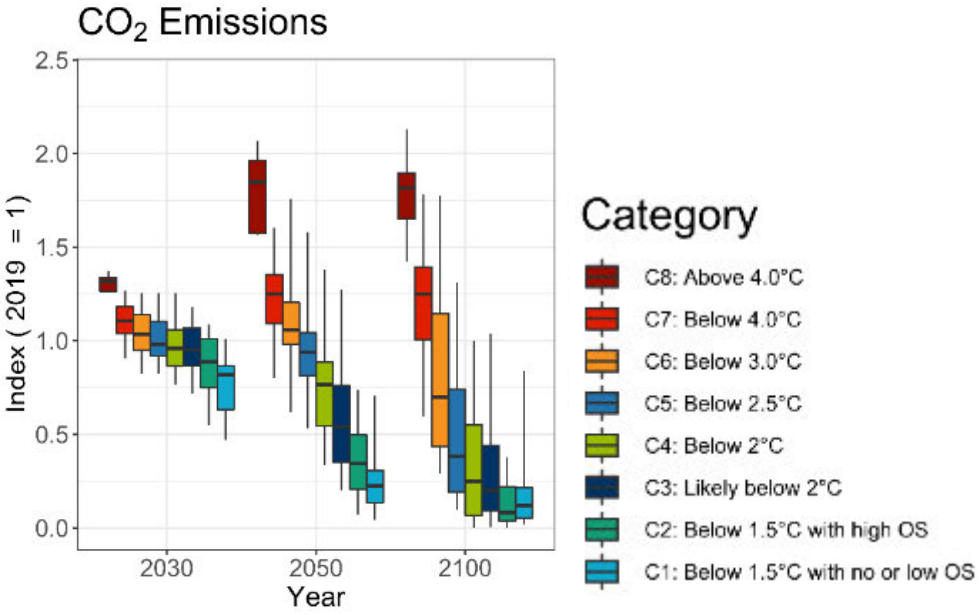
[8] Pivo, G., UN Environment Programme Finance Initiative Property Working Group. (2008). "Responsible property investing: what the leaders are doing", *ibid.*

[9] https://www.unpri.org/real-estate/sustainable-real-estate-investment-implementing-the-paris-climate-agreement/138.article

In terms of climate change, the 5th Assessment Report by the Intergovernmental Panel on Climate Change (IPCC), the international body for assessing the science related to climate change, ascertained there was robust evidence and agreement that:

"Buildings represent a critical piece of a low-carbon future and a global challenge for integration with sustainable development."[10]

One reason why buildings are so central to a low-carbon future is that all pathways that limit global warming to adopted international goals depend on buildings greatly reducing GHG emissions. According to the 2022 IPCC 6th Assessment Report, to achieve the Paris Agreement of keeping global temperature rise well below 2 degrees, we will need to reduce the carbon emissions from buildings by more than 50% by 2050 and 85% by 2100.[11]



Note: This figure shows changes in global building CO2 emissions by 2030, 2050, and 2100 associated with various temperature change scenarios in relation to 2019 emissions. Scenarios C1, C2 and C3 would achieve the Paris climate goal. Source: IPPC, Assessment Report 6, Chapter 3, pg. 3-60.

Another key opportunity for GHG abatement lies in the transport sector which accounts for 37% of carbon emissions and is the most reliant on fossil fuels among all sectors. It has rebounded alarmingly from the temporary drop

[10] Lucon O., D. et al. (2014). "Chapter 9: Buildings." In *Climate Change 2014: Mitigation of Climate Change*. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O. et al (eds.)]. Retrieved from: http://www.ipcc.ch/report/ar5/wg3/

[11] https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_Chapter_03.pdf

caused by the Covid-19 pandemic, growing by 8% globally in 2021.[12] Beyond its direct impact on the climate, transportation is also closely linked to how buildings contribute to GHG quantities. The location of buildings can have a significant impact on how much driving is required as compared to less carbon intensive or multi-passenger transportation options[13,14]. When jobs or homes are closer together, near transit, or in bikeable and walkable places, then residents, workers, and customers drive shorter distances or travel by less carbon-intensive alternatives than driving alone.

The fate of other environmental systems is also connected to real estate decisions. For example, building location, design, and management affect water conservation, water pollution, flood hazards, and equitable access to water services. They also affect biodiversity by restoring or protecting habitats within and around development sites. There are few environmental issues that are not firmly tied to real estate decisions, one way or another.

2.2 The Social Opportunity for Buildings

How we manage our buildings creates many opportunities to benefit people as well. This directly affects the social or human leg of the three-legged stool of sustainability, which describes our concern for people, prosperity, and the planet. We understand that social isn't the best understood or discussed dimension of sustainability in real estate – for example nearly 3½ times as many points can be earned for environmental than social items in the widely known Global Real Estate Sustainability Benchmark. But we believe that social issues are just as important as environmental ones in the overall scheme of sustainability.

Over twenty years ago, Polese and Stren wrote their definition of social sustainability at the urban scale:

'Development (and/or growth) that is compatible with harmonious evolution of civil society, fostering an environment conducive to the compatible cohabitation of culturally and socially diverse groups while at the same time

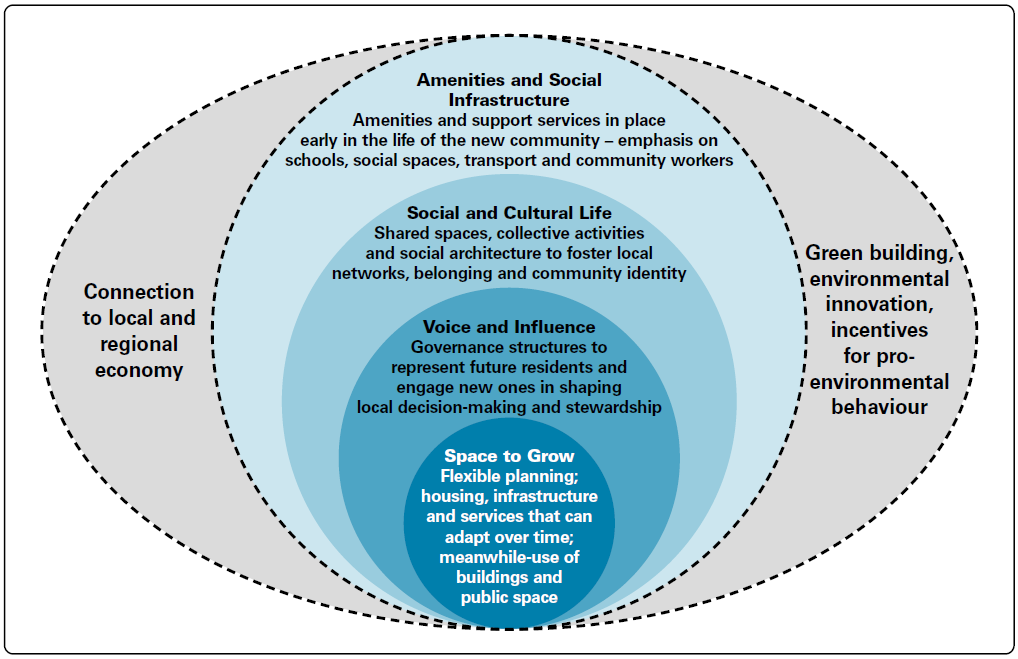
[12] https://www.iea.org/topics/transport

[13] Cervero, R. America's Suburban Centers: The Land-Use-Transportation Link; Unwin Hyman: Boston, MA, USA, 1989

[14] Wegener, M., & Fuerst, F. (2004). Land-use transport interaction: State of the art. SSRN 1434678.

encouraging social integration, with improvements in the quality of life for all segments of the population.''[15]

More recently, The Berkeley Group, a British homebuilder, described social sustainability as being '… about people's quality of life, now and in the future. It describes the extent to which a neighborhood supports individual and collective wellbeing.' And they have demonstrated how it can be assessed by focusing on 3 general dimensions: Amenities and Social Infrastructure, Social and Cultural Life, and Voices and Influence.[16]



Source: The Berkeley Group[17]

Currently, across many property types, it is not uncommon to see leading REITs pursuing opportunities to improve health and safety, inclusive economic opportunities, stakeholder engagement, and diversity, equity and inclusion. For example, in addition to reducing GHG emissions, investing in buildings in walkable, bikeable, and transit-oriented districts increases physical activity among occupants and visitors, which in turn reduces obesity and physical inactivity, which are leading risk factors in many leading causes of death. It also makes the jobs, shops, and homes in those places more accessible to

[15] Polese, M. and R. Stren (eds.). The Social Sustainability of Cities: Diversity and the Management of Change. Toronto: University of Toronto Press, 2000.

[16] S. Woodcraft and N. Bacon: Living at Kidbrooke Village. The Berkeley Group, 2013. www.sociallife.co/media/files/Living_at_Kidbrooke_Village.pdf

[17] ibid

lower income transit-dependent households. Meanwhile, REITs and other real estate firms can increase the diversity and gender balance in leadership and staffing. They can also pursue affordability as a priority in housing and commercial portfolios, which can reduce gentrification and support locally owned and "legacy" shops and organizations that are critical to established community character. The pursuit of these and other socially beneficial strategies in real estate, strengthen our achievement of the human dimension in sustainability.

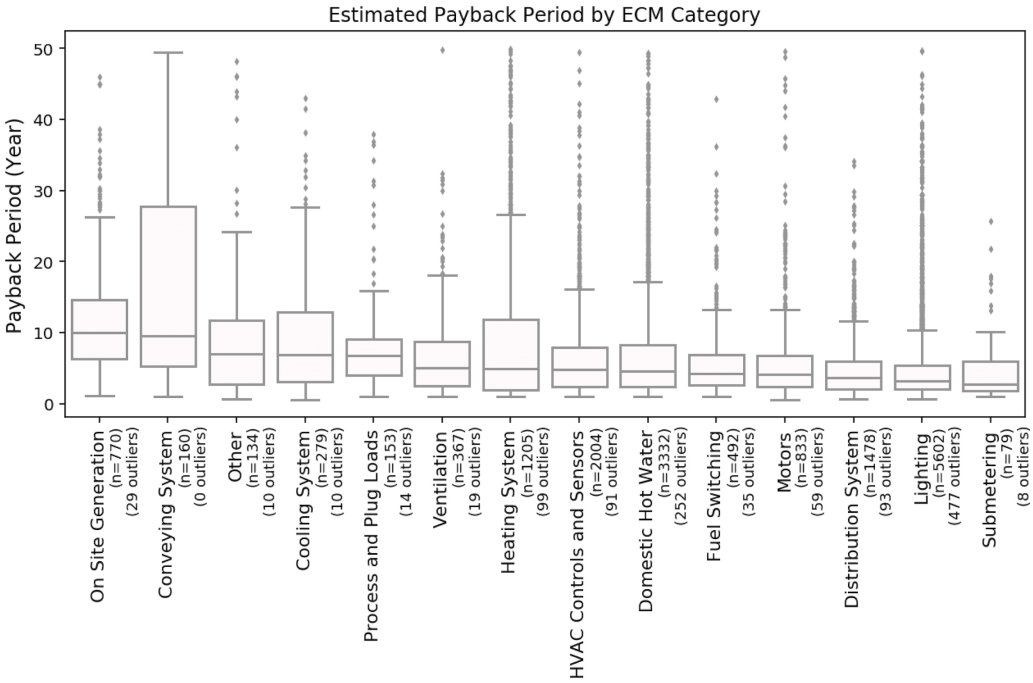
2.3 The Economic Opportunity for Buildings

In real estate, addressing emissions reduction isn't just a win for the environment, it is also an economic opportunity. Making sustainable upgrades to properties old or new can have beneficial results in terms of cash flow. For instance, a property with green building certifications can see higher occupancy rates or increased tenant satisfaction which can translate into longer leases, higher demand, and a rent premium. And that can reduce default risk and improve loan terms. Meanwhile, implementing sustainability remediation or improvements can reduce operational costs through lower operating expenditures and maintenance costs; lower exposure to energy price risk; and lower insurance and debt cost. Additionally, addressing sustainability issues can affect the market values of a property or portfolio by providing a price premium, lower volatility and slower rate of depreciation.[18] (For empirical research that support these findings, please see Appendix A).

There is also great potential to abate GHG emissions in the building sector by installing efficient systems in new and existing residential, commercial and public buildings. In new buildings, this is normally achieved through building design and orientation that takes advantage of passive solar energy and by building with less energy intensive buildings materials to lower "embodied carbon". For existing buildings, there are many energy conservation measures (ECMs) with payback periods of less than 5 or 10 years, as shown below. [19]

[18] Fuerst, F. and McAllister, P. M. (2011) Green noise or green value? Measuring the effects of environmental certification on office values. *Real Estate Economics* 39.1 (2011): 45-69.

[19] Lai, Y., Papadopoulos, S., Fuerst, F., Pivo, G., Sagi, J., & Kontokosta, C. E. (2022). Building retrofit hurdle rates and risk aversion in energy efficiency investments. *Applied Energy*, 306, 118048.



Large amounts of capital will be needed if for the buildings sector to achieve its full abatement potential. This makes it important to find attractive investment vehicles that will channel funds to property companies that are making GHG abatement investments in real estate portfolios. However, while upfront financing might be challenging, as shown below, the long-term abatement cost for several key measures in the buildings sector is negative, because the investments pay for themselves in energy savings.[20]

For example, in 2010 the iconic New York Empire State Building underwent a retrofit.[21] Originally built in 1930, it languished in recent decades, no longer appealing to office tenants who had moved downtown or to Brooklyn. However, it maintained its standing as a leading tourist attraction known for its celebratory light display and rooftop lookout. Some of the high impact refurbishments included rebuilding 6,524 single pane windows, replacing the HVAC system, and installing reflective insulation. These improvements achieved an annual energy reduction of 38% which translated to an energy

[20] https://www.ipcc.ch/report/ar6/wg3/figures/summary-for-policymakers

[21] Empire State Building (2014). "Sustainability & Energy Efficiency." [Information Section]. Retrieved from www.esbnyc.com/esb-sustainability

cost savings of $4.4 million per year with a payback period of 3.1 years. The GHG reduction was 105,000 tons over 15 years which is the equivalent of removing 20,000 cars from the road. In recognition of these improvements, the building achieved Leadership in Energy and Environmental Design (LEED) Gold Status in 2011.

It is estimated that 60% of existing buildings will be renovated between now and 2030.[22] With this in mind, energy efficient solutions should be considered when redesigning existing buildings that cities will we rely on for the next 60+ years.

2.4 The Regulatory Case for Sustainable Buildings

Building owners face increasingly stringent green building requirements. City, state, and national governments are driving the adoption of sustainable development and retrofits. Companies that are proactive about their buildings' sustainability are better placed for these regulations and face fewer potential fines and compliance costs going forward. We list only a few examples below:

Cities

The cities of Toronto and San Francisco, among others, require all new buildings to have green roofs or solar panels. Eighteen US cities now require buildings to benchmark and report on their total energy use. Some cities require LEED certification for government and private commercial buildings. In Miami, San Francisco and San Jose, any commercial building over 25,000 square feet must be LEED certified. In Seattle, Philadelphia, or Indianapolis private LEED projects receive incentives such as expedited permits or density bonuses.[23]

The European Union

Countries in the European Union (EU) are implementing strict regulations on building energy efficiency. The 2010 EU Energy Performance of Buildings Directive requires all new buildings to be nearly zero-energy by the end of 2020. All new public buildings were required to be nearly zero-energy by 2018.

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[22] World Resources Institute (2016, May 11) "4 Surprising Ways Energy-Efficient Buildings Benefit Cities" Retrieved from http://www.wri.org/blog/2016/05/4-surprising-ways-energy-efficient-buildings-benefit-cities.

[23] Everblue Training (2015). "Cities Requiring or Supporting LEED." [Blog post]. Retrieved from http://www.everbluetraining.com/blog/cities-requiring-or-supporting-leed-2015-edition.

The directive encouraged individual countries to legislate even tougher regulations individually.[24]

The UK

England and Wales have taken steps to make all buildings more sustainable. The 2015 Energy Efficiency Regulations set out minimum energy efficiency standards (MEES) that make it unlawful for owners to lease properties that have an energy performance certificate (EPC) rating below E, after April 1, 2018. EPC ratings go from A to G on a 100-point scale: this means any building scoring less than 39 cannot be rented. A pending proposal would raise the rentable standard to C by 2028.[25]

New York City

In 2019 New York City passed Local Law 97 as part of the city's Green New Deal. All existing buildings larger than 25,000 square feet will need to meet strict energy efficiency and greenhouse gas emissions limits by 2024, with stricter limits coming into effect in 2030. These requirements will apply to about 14,500 private and municipal buildings, which the mayor's office says collectively account for nearly a quarter of New York City's emissions. Most buildings would need to comply with new efficiency targets by 2030, or their owners would face penalties ranging from $60,000 to $2 million.[26]

[24] Energy Performance of Buildings Directive (2010/31/EU). European Parliament and of the Council of 19 May 2010. 18.6.2010 Official Journal of the European Union L 153/13. Retrieved from http://ec.europa.eu/energy/en/topics/energy-efficiency/buildings/nearly-zero-energy-buildings

[25] HM Government (UK) "Powering our Net Zero Future" December 2020. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/945899/201216_BEIS_EWP_Command_Paper_Accessible.pdf

[26] New York City Government Sustainable Buildings. Retrieved from: https://www.nyc.gov/site/sustainablebuildings/ll97/local-law-97.page

3. THE OPPORTUNITIES FOR REITs

How can investors in the capital markets build a better tomorrow using the real estate asset class? Publicly traded REITs may offer a viable solution.

DEFINITION: REIT

A real estate investment trust (REIT) is a company that owns real estate assets such as buildings and land and generates income from leasing the assets. REITs are legally required to distribute a large portion (at least 90% in the US) of their taxable income to investors. The US contains the largest listed real estate market. The REIT investment vehicle originated in the US in the 1960's as a way for individual investors to access investment in real estate in a more liquid and diversified way than buying properties directly.

In the US, real estate investment trusts or REITs own a significant share of the building stock. They own offices, warehouses, data centers, shopping centers, student housing, apartment buildings, hotels, healthcare, and self-storage. This position in the market gives REITs an important role in fulfilling sustainability objectives. They can both manage their building assets to become more sustainable, demonstrate to other types of owners what can be achieved, and collaborate with a range of stakeholders to promote technologies and policies that enable them to achieve even more.

In 2021, the gross value of all commercial properties (excluding individual homes) in the US was approximately $20.7 trillion. The National Association of Real Estate Investment Trusts estimates that REITs own 9.4% of the total commercial real estate market.[27]

There are other types of real estate owners, though the public nature of the REIT investment structure creates an interesting 'look through' opportunity for investors, in addition to property owners and managers, to be accountable. The opportunity for REITs to lead by example is perhaps even more important than their capacity to directly affect the future of our built environment. The publicly traded REIT allows for investors (shareholders) to potentially influence owners towards integrating more sustainability-focused policies and practices. Many REITs focus on sustainability as a profit driver by 1) reducing costs through energy efficiency upgrades and retrofits and 2) increasing rents and values, through healthier buildings and sustainable certifications.

3.1 How Do REITs Contribute to Sustainability?

There are three ways in which REITs can contribute to sustainability. First, they can be smart about the buildings they acquire and develop. This includes buying or building properties that are eco-efficient (e.g., energy and water smart), contribute to sustainable urban form (e.g., transit-oriented and ecologically landscaped), and reinforce strong, healthy neighborhoods (e.g., by engaging neighbors, adding needed services and avoiding involuntary

[27] NAREIT. 202. Retrieved from https://www.reit.com/data-research/research/nareit-research/estimating-size-commercial-real-estate-market-us-2021

displacements). Second, REITs can increase sustainability when they upgrade or refurbish properties by adding conservation measures, improving handicap access, or using responsible contractors. And third, REITs can be better property managers, such as by encouraging tenants to recycle or conserving water when they irrigate landscapes.

Real estate investment decisions are typically made by companies (not investors) and must be understood in the context of a particular portfolio or fund. For example, an asset (i.e., the building) with a given set of environmental and financial performance characteristics may be acquired by a REIT in a bid to increase the greenness of its overall portfolio rather than exclusively on the merits of the property itself. Similarly, energy efficiency retrofits are frequently rolled out across all assets held by a company in a concerted effort as opposed to a piecemeal building-by-building approach. This type of top-down decision-making shows that REIT companies need executive leadership buy-in to pursue sustainability issues. (For empirical research supporting these findings, please see Appendix A).

REITs also have a fiduciary responsibility to be socially and environmentally responsible.[28] According to the UNEP Finance Initiative Property Working Group, there is growing evidence that sustainability criteria are material for investors and therefore property owners have a fiduciary duty to understand, consider and report on sustainability issues. Some of the best practices that real estate investment firms pursue include: 1) establishment of executive sustainability committees, 2) engagement by the firm with outside stakeholders, suppliers, and tenants, 3) adoption of standards and performance targets on sustainability issues, 4) investing in property types and improvements consistent with the standards and targets, and 5) corporate reporting on sustainability metrics in public documents.

3.2 Special Owner and Tenant Responsibilities

A unique feature of the property sector is that the asset (or building) performance has two inputs: the owner and the tenant. It is the tenant who largely controls the space they have leased. As a result, the sustainability performance of a property is influenced by tenant behavior, such as regulating A/C use, recycling, ridesharing or bicycle-purchasing programs. This tenant/owner dynamic demonstrates the need for REITs who are leaders in sustainability to empower their tenants towards sustainable behaviors so that

[28] UNEP FI Property Working Group (2009 October). *Sustainable Investment in Real Estate, Your Fiduciary Duty.* UNEP Finance Initiative.

the whole asset operates more sustainably. The ideal way to think about sustainability in buildings is to discuss *the whole building* - the common areas controlled by the owners and the leased areas controlled by the tenants.

Sustainability issues pertaining to REITs are determined by the physical characteristics of 1) buildings it owns and 2) corporate policies and practices that guide their operations and management.

The categories of relevant physical property characteristics include construction materials, technical equipment, energy sources, siting, and design.[29] These are the characteristics that in turn affect the performance and quality characteristics more directly related to sustainability, such as structural safety, resilience against natural or man-made hazards, transport accessibility, energy efficiency, land use, and life-cycle costs. Such building characteristics, however, are determined by management decisions taken by property owners. Examples of such decisions include choices made when upgrading, refurbishing or retrofitting to improve safety or eco-efficiency. Other relevant decisions concern choices about the operational supply chain, such as whether "responsible contracting" is used when selecting service providers. An example is when janitorial companies are expected to provide their workers with meaningful benefits and a living wage.

Real estate stakeholders can pursue a sustainability agenda more easily with generally agreed upon sustainability principles and metrics as summarized in the following section.

[29] The characteristics and management practices are listed and discussed in depth in Sustainability Metrics: Translation and Impact on Property Investment and Management, published in 2014 by the Property Working Group (PWG) of the United Nations Environment Programme Finance Initiative (UNEP FI). UNEP FI is a partnership of global policy makers and financial intermediaries. The PWG includes more than two dozen members including some of the world's leading property investors such as CalPERS (USA), Colonial First State Global Asset Management (Australia), Infrastructure Leasing & Financial Services (India) Sumitomo Mitsui Trust Bank Limited (Japan), and Hermes Real Estate (UK).

4. DEFINING THE METRICS OF SUSTAINABILITY IN REAL ESTATE

There are many issues and considerations contained in the phrases "sustainability agenda" or "sustainability practices." Integrating ESG criteria into the investment approach is not a one-size-fits-all overlay. Specific issues are more material to certain industries and will have material impact on a company's bottom line. What issues, factors and criteria are relevant and financially material to real estate?

4.1 The Most Pressing Issues and Important Risks

To determine the most important issues and risks in real estate, we start at the beginning. The foundations of sustainability are built in the definition of sustainable development outlined in the 1987 Brundtland Report for the UN World Commission on Environment and Development.[30] Those targets focused on the protection of natural, social, and financial assets:

- Protection and restoration of ecosystems and natural resources,
- Protection and improvement of human health and well-being,
- Protection and promotion of social values and public goods, and
- Protection of capital and material goods.

These protections are summarized in the triple bottom line concept for business – people, planet, and profit. The general principles to protect natural, social, and financial assets are often used as a guidepost by various stakeholders (asset owners, investors, scientists, academics, builders, designers) interested in global risks that would affect the economic value of real estate.

Global risks to natural resources (when they occur) affect our infrastructure, economy, and livelihoods. These global macroeconomic risks are summarized in standards produced by the International Organization of Standardization

[30] The definition of sustainable development provided in the 1987 Bruntland Commission report "Our Common Future" delivered to the World Commission on Environment and Development is widely credited for creating public awareness and tying pursuit of sustainability to human and economic development. The report stated, "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: (1) the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and (2) the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs."

(ISO).[31] Specifically, the standard ISO 21931-1:2010 entitled, "Sustainability in Building Construction: Framework for methods of assessment of the environmental performance of construction works, Part 1: Buildings" provides a general framework for improving the quality and comparability of methods for assessing, measuring and benchmarking the environmental performance of buildings. The standard recommends the following indicators organized into three groups pertaining *to location*, *the plot of land*, and *the building* itself, and are as follows in Table 1:

Table 1: ISO indicators to identify and compare the environmental performance of buildings.

For location:	For the plot of land:	For the building:
• access to modes of transportation, green and open areas, and user-relevant basic services (e.g., food or childcare services)	• change of land use • accessibility of the site	• global warming potential • ozone depletion potential • non-renewable resource consumption • freshwater consumption • waste generation • accessibility of the building (e.g. for handicapped) • indoor conditions (thermal, visual and acoustic comfort) • indoor air quality • adaptability (change of use or user needs; climate change) • lifecycle cost • maintainability • safety (structural safety, fire safety, safety in use) • serviceability (fit for purpose) • aesthetic quality

Source: International Organization of Standardization. (2010). *ISO Standard 21931-1:2010, Sustainability in building construction – Framework for methods of assessment of the environmental performance of construction works – Part 1: Buildings.* Available at https://www.iso.org/standard/45559.html

[31] ISO is a member-based organization that develops standards for industries through consensus and input from multi-stakeholder groups including industry, consumer associations, academia, NGOs and governments. More information is available at: https://www.iso.org/developing-standards.html

These indicators are used in the real estate industry to guide projects on environmental considerations. Similarly, as an investment framework, when evaluating criteria for ESG integration, these indicators could be used to measure the sustainability of REITs' property portfolio. The levels of success will translate not only into impacts on broader social and environmental outcomes; it can also affect a REIT's financial outcomes.[32] Energy performance can affect utility expenses, indoor air quality can affect occupancy rates, and site accessibility can affect rents, all of which will accrue to property cash flow, value and return on investment. For these reasons, sustainability is increasingly understood as having financial materiality along with social and environmental significance.

4.2 Defining the Most Relevant and Material Metrics

The previous section outlined the most pressing concerns and important risks at a macro level. This section drills deeper into those issues to identify metrics that can be used to make meaningful distinctions between more and less sustainable properties and property portfolios. Unfortunately, this is not a straightforward process. What is most important varies from one stakeholder to the next. What is financially most material can vary greatly between real estate sectors such as residential and commercial. And some issues are not easily measured or widely reported.

Fortunately, a wide range of groups working within real estate, science, technology, and finance have been monitoring and analyzing the buildings sector for environmental and economic impacts. They have published which metrics are most important, and which are best for consideration and comparison. Two perspectives are particularly relevant for real estate investment: expert & stakeholder panels, and sustainable buildings & real estate rating systems.

Expert and Stakeholder Panels

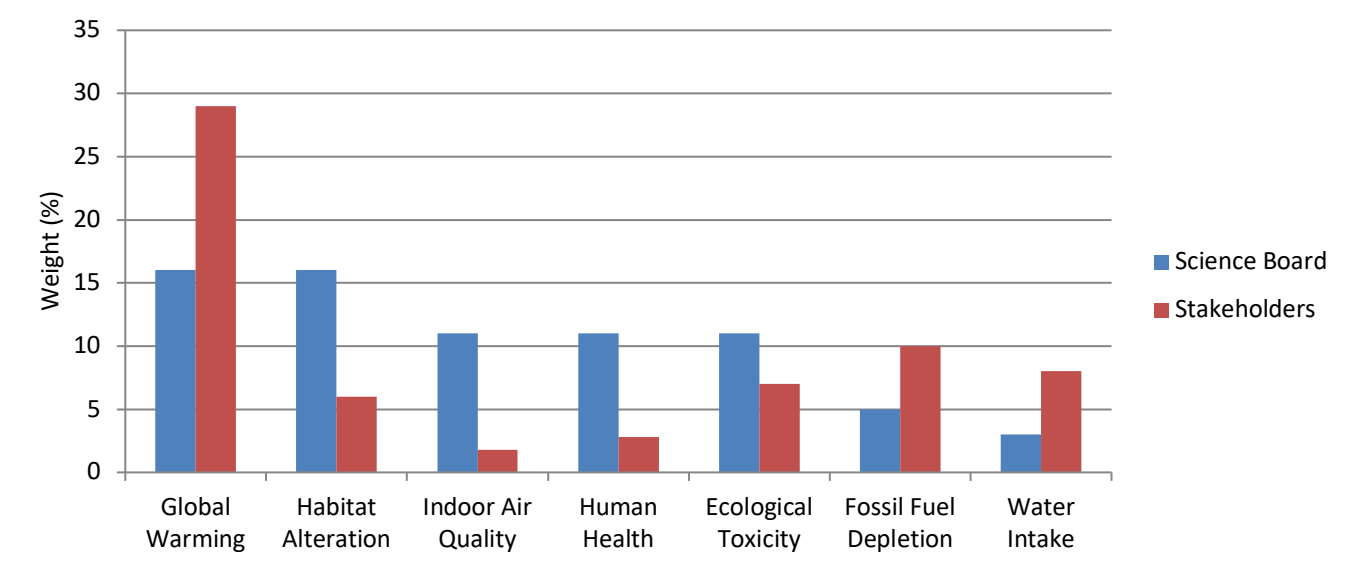
Polling experts and convening stakeholders is a common way to identify relevant sustainability metrics.

In 2006 The National Institute of Standards and Technology sponsored Barbara Lippiatt's research, *Building for Environmental and Economic*

[32] United Nations Environment Programme Finance Initiative (UNEP FI), the Property Working Group (PWG) (2014) *Sustainability Metrics: Translation and Impact on Property Investment and Management,*

Sustainability, also known as the BEES project.[33] Lippiatt used data from the US Environmental Protection Agency Science Advisory Board and a stakeholder panel representing green building designers, building product producers, and life-cycle analysis experts. The BEES project identified and ranked priorities from these stakeholders, shown in Figure 4, below:

Figure 4: Relative Importance Weights of Environmental Impacts



Source: Lippiatt, B. (2007). *BEES 4.0: Building for Environmental and Economic Sustainability, Technical Manual and User Guide.* National Institute of Standards and Technology. U.S. Department of Commerce. Retrieved from https://www.nist.gov/publications

Another panel was convened by the UNEP FI Property Working Group for their report on "responsible property investing" (RPI). This differs from the BEES work by including social, economic, and environmental issues and by being produced by and for real estate investors. While they did not specify relative importance, they did list their "10 elements" of RPI as follows:

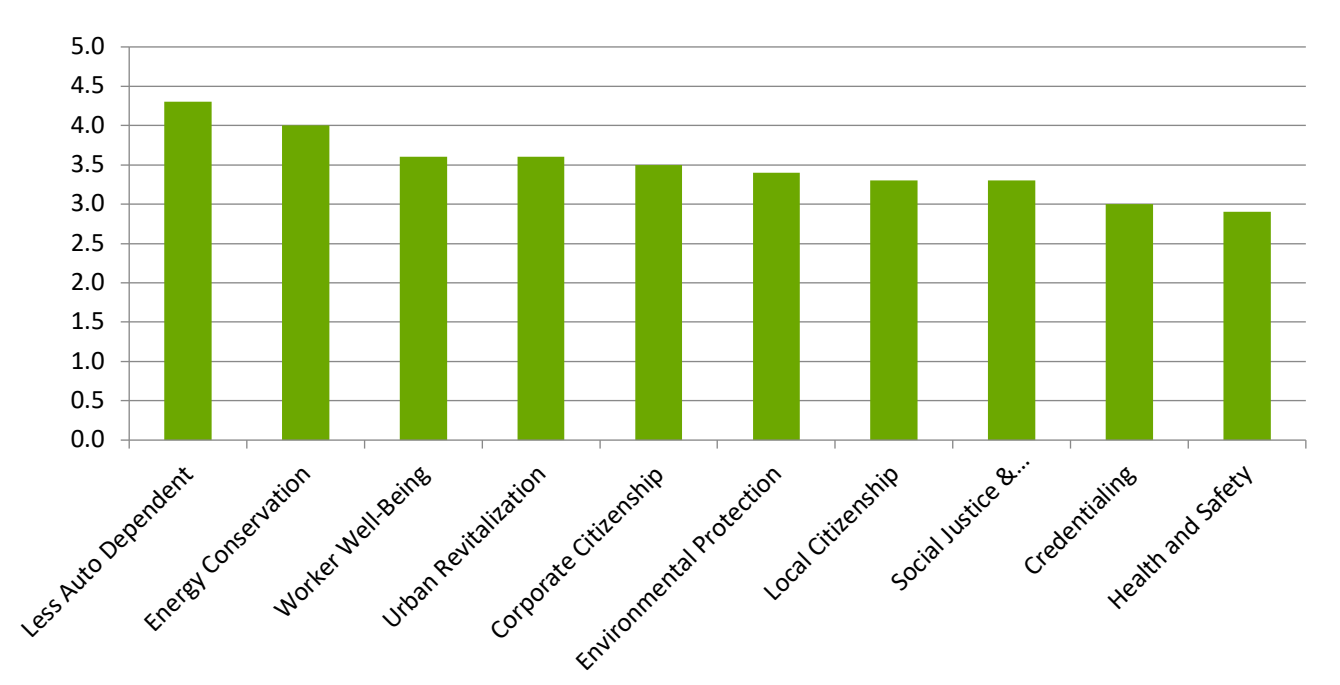
- Energy Conservation
- Environmental Protection
- Green Buildings
- Public Transport Oriented Development
- Urban Revitalization
- Health and Safety
- Worker Well-Being

[33] Lippiatt, B. (2007). *BEES 4.0: Building for Environmental and Economic Sustainability, Technical Manual and User Guide.* National Institute of Standards and Technology. U.S. Department of Commerce. Retrieved from https://www.nist.gov/publications

- Corporate Citizenship
- Social Equity and Community Development
- Local Citizenship

Complementary to these studies, Professor Gary Pivo (a member of the Vert Investment Research Group) published the results of an international panel study prioritizing criteria to evaluate property investments in terms of their social, economic, and environmental responsibility.[34] Figure 5 shows the relative importance of each issue from most (5) to least (0):

Figure 5: Relative Importance of Dimensions in Responsible Property Investing



Source: Pivo, G., and Fisher, J. D. (2010). Income, value, and returns in socially responsible office properties. Journal of Real Estate Research, 32(3), 243-270.

The last example comes from the Institutional Investor Group on Climate Change (IIGCC). The IIGCC is a forum for collaboration on climate change for European investors seeking to catalyze investments in a low carbon economy. Their goal was to identify simple, meaningful metrics that are cheap and practical to gather, and indicate the degree to which a property portfolio is contributing to and exposed to climate risk. Again, without prioritizing, they recommended seven metrics:

[34] Pivo, G., and Fisher, J. D. (2010). Income, value, and returns in socially responsible office properties. Journal of Real Estate Research, 32(3), 243-270.

- Energy Use and Efficiency
- Water Use and Efficiency
- Waste Production and Recycling
- Accessibility by Public Transport and Bicycle
- Flood or Coastal Erosion Risk
- Land Consumption
- Tenant Engagement

Sustainable Building and Real Estate Rating Systems.

We finally turn to the practitioners owning and operating the buildings. They work with the most practical metrics because these are what are measured and reported on a daily basis.

The Global Reporting Initiative (GRI) is one of the world's most widely used standards for corporate sustainability reporting across industries. The *GRI Construction & Real Estate Sector Supplement* (GRI CRESS) was designed to help REITs and other companies in the sector identify, measure and report on issues pertinent to their business activities. The standards were developed by a multi-stakeholder, geographically diverse Working Group, formed by volunteers from construction and real estate companies, investors, labor, non-governmental organizations, and research organizations.[35] The GRI CRESS identifies the following six "core indicators" most applicable to real estate businesses:

1) Energy
2) Water
3) GHG Emissions
4) Land Remediation
5) Displaced Persons
6) Green Buildings.[36]

[35] Global Reporting Initiative (GRI). *Construction and Real Estate Sector Supplement CRESS*. Retrieved from https://www.globalreporting.org/information/g4/sector-guidance/sector-guidance/construction-and-real-estate/Pages/default.aspx

[36] Ibid.

The Global Real Estate Sustainability Benchmark (GRESB) is quickly becoming the go-to reference for real estate companies and investors worldwide. Companies are scored on several dimensions using dozens of metrics and scales. The percentage that can be earned in each item line indicates its relative materiality in the benchmark (maximum total 100%), shown in Table 2 below:

Table 2: Measurements that contribute towards earning a GRESB score

Item to be Scored	Potential Percentage
Performance Indicators (e.g., energy data) *- 16% energy related items*	25%
Stakeholder Engagement (e.g., tenants)	25%
Risks and Opportunities (e.g., retrofits) *- 3% energy related items*	12%
Building Certification (e.g., Energy Star) *- 4% energy related items*	11%
Management (e.g., employee incentives)	9%
Policy and Disclosure (e.g., GRI)	9%
Monitoring and EMS (e.g. data mgt.) *- 2% energy related items*	9%
Sum of all energy related items *(italicized in line items above)*	***26%****

For illustrative purposes only.
Source: Global Real Estate Sustainability Benchmark (GRESB). Available at: https://gresb.com.

The Leadership in Energy and Environmental Design or LEED program managed by the US Green Building Council is the most widely used green building certification in the world. An examination of its current criteria (LEEDv4) reveals its category weights in Table 3 below:

Table 3: Measurements and weights to earn a LEED certification

LEED 4 CATEGORY	WEIGHTS
Energy and Atmosphere	38%
Indoor Environmental Quality	17%
Location and Transport	15%
Water	12%
Sustainable Sites (e.g., habitat conservation)	10%
Materials (e.g., sustainable wood products)	8%

For illustrative purposes only.
Source: Leadership in Energy and Environmental Design (LEED) Available at: https://new.usgbc.org/leed-v4.

In summary, the real estate sector is facing increasing pressure from markets, governments and the general public to define and prioritize sustainability issues. There is a broad consensus among the experts that sustainable and future-proof companies are those that: find ways to reduce energy and water consumption, site buildings to take advantage of public transport and local services, and foster the health and well-being of tenants, employees, and the wider community. (For empirical research that support these findings, please see Appendix A).

DEFINITION: E, S, G criteria and the economy

Social, environment, and economic issues are endemic to real estate. The built environment has a huge impact on people and planet. The end objective of sustainable investing, or more specifically evaluating E, S, and G criteria, is to push capitalism towards a more sustainable operating model. 20th century capitalism was defined by an extractive model that failed to account for resource depletion and waste. Growth has been coupled to a rise in pollution, most notably greenhouse gases. 21st century capitalism aims to 'decouple' this link between economic growth and pollution. In the case of real estate, decoupling refers to maximizing the productivity of land and buildings while reducing the consumption of resources and the production of waste and pollution. Considering ESG criteria in real estate investing accelerates the transition to a low carbon economy.

5. A STRATEGY FOR INVESTING IN SUSTAINABLE REITs

5.1 Determining the Starting Universe

To invest for sustainability in real estate, an investor must choose the most suitable companies from among a large universe of possibilities as real estate is one of the world's largest asset classes. For a mutual fund or ETF strategy that has individual investors as shareholders, the most suitable set of companies are publicly listed and traded companies. Within the public real m of real estate firms, we have chosen to focus on Real Estate Investment Trusts (REITs) and REIT-like firms. These firms have in common the role of being the property owners, operating as landlords and collecting rents. This group makes up the vast majority of the real estate sector both by number of firms and by market value.

5.2 Financial Criteria

Managers often use financial criteria in an attempt to pick winners and avoid losers. We avoid this approach. We don't forecast, and we believe markets price firms fairly with the information available.

We use financial criteria to limit uncompensated risks, lower costs, and ease implementation. These are our criteria.

Country

Country selection can raise both financial and sustainability considerations. For example, in 2014 the top carbon dioxide (CO_2) emitters were China, the United States, the European Union, India, the Russian Federation, and Japan.[37] So, an investor might wish to focus on sustainable REITs that own properties in those countries, to promote CO_2 reduction in the highest-emitting nations. On the other hand, investors may have financial reasons for focusing investments on certain geographies or types of REITs (e.g., prison or fossil fuel). However, insofar as sustainability is a multi-issue, long-term, global concern, we choose to begin with a global approach, seeking out the

[37] U.S. Environmental Protection Agency (EPA) (2017). "Global Greenhouse Gas Emissions Data." Greenhouse Gas Emissions. Retrieved from https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data

most sustainable REITs of all types, all over the world. We exclude countries where we feel there are inadequate foreign investor protections, high fees, or uncompensated risks. Countries that do not have REIT or REIT-like structures are, by definition, excluded.

Leverage

REITs use relatively high levels of debt to finance the ownership of their properties. Academic research has shown that REITs that borrow excessively have lower stock returns. We exclude REITs with high levels of leverage.

Market Cap

To maintain trading capabilities and limit risk, REITs under $50 million in market cap are excluded.

Free Float

Real estate firms often partner other firms to lower risk and leverage operational expertise. In some cases, cross-ownership is significant. To not overweight any firms, and to limit the power of a majority shareholder, we exclude firms without significant free float.

Operating History

Only firms with a minimum of 3 years of operations are considered.

Liquidity

We only purchase companies that have sufficient trading volume.

Listing

We select companies that are listed on major exchanges with strict listing requirements.

5.3 ESG Security Selection Criteria

Issues, Metrics, Data

In a previous section we summarized our research to identify the most important sustainability issues in the property sector. There is no shortage of issues to choose from as the built environment has such an important role in human lives and an outsized impact on the environment. We choose to emphasize ESG *issues* that are sustainably material to the REIT itself.

Using material *metrics* drives selection toward REITs that excel in more focused, critical areas to their specific business. These metrics may vary across sub-sectors within real estate. For example, in data centers energy efficiency and renewable energy procurement are more important than urbanism since there are very few people commuting to data centers.

With the most relevant issues and metrics in mind, the *data* selected to rate sustainability must be selected. It must be valid, current, and reliable. Information available from REITs and third-party vendors is growing rapidly, but it is often neither comprehensive nor transparent. A valid assessment of a REIT's sustainability performance requires that information is blended from a variety of sources, keeping in mind the definitions and differences among the various metrics.

With our issues, metrics, and data sources set, we can begin selecting the REITs that are leaders in sustainability. We start with a global list of more than 800 publicly traded REITs. We then use positive and negative selection screens to identify those that qualify to be included on a list of the world's most sustainable.

POSITIVE SCREENS

Some REITs are companies that are world leaders on critical sustainability issues or practices. They are contributing to real progress on important issues and deserve inclusion on a list of sustainable REITs. To qualify on this list a company had to demonstrate the highest levels of performance by being among the top 10 percent of all companies on certain metrics, receiving national or global recognition in certain competitive award or ratings

programs, or reducing their energy and/or greenhouse gas emissions at a rate sufficient to meet international climate goals. Our qualifying criteria include:

QUALIFYING CRITERIA	KEY PERFORMANCE INDICATORS
Environmental	Energy & GHG Reductions Green Building Certifications Green Leasing
Social	Stakeholder Engagement Urbanism & Public Transit Orientation Affordable Housing
Governance	Disclosure & Reporting Greenhouse Gas Policies & Programs Diversity, Equity & Inclusion

NEGATIVE SCREENS

Finally, the list of companies that qualified are put through negative screens, which disqualify firms for violating certain minimum standards. Our disqualifying criteria are:

DISQUALIFYING CRITERIA	RED FLAGS
Business Line	Fossil Fuel Industry Prison Industry
Controversy	Bribery, Corruption, Human Rights, Displacements, Environmental Fines
Climate Risk	Flood Risk, Sea Level Rise, Heat Stress, Drought, Storm

The result is a list of companies committed to sustainability as a driver of value in their business. Investors in these companies can rest assured they are putting their money in the leaders and innovators in real estate.

5.4 Portfolio Construction

Once the securities have been selected, we construct portfolios in such a way as to maintain diversification, minimize costs, and manage tracking error to the benchmark.

Sustainable investment strategies must balance a trade-off between sustainability and diversification. The most diversified strategy would hold all stocks in the universe; the most sustainable strategy might hold only a few ESG leaders. Our approach is to hold only those companies that have a demonstrated commitment to sustainability. Fortunately, in our selection process we can identify close to 150 stocks that meet this test. These sustainable REITs make up approximately 25% of the total number of REITs in our universe by name. These same REITs capture close to 50% of the REIT universe by market weight. By holding close to 150 names, the strategy maintains adequate diversification.

The selected securities are held close to market cap weights. The primary benefit of this weighting strategy is that it reduces trading costs. When a stock is held at a market cap weight, it is not necessary to buy or sell the stock to maintain that relative weight whenever the stock price changes. Another benefit to market cap weighting is that it helps keep the portfolio more aligned to the benchmark in terms of country and sector weights.

The strategy does not specify targets for country or sector weights, rather it lets them adjust with the market. We monitor these weights and may take steps to adjust sectors or countries if they become too far out of line with the benchmark. To maintain diversification, in certain circumstances, we stop purchasing an individual company if it's weight in the portfolio gets above 5%. We also limit the weight of the US to 70% of the portfolio so the strategy maintains a global approach.

5.5 Portfolio Re-Qualification

On an ongoing basis, portfolio holdings will be monitored for any controversies or for possible changes in their status as qualified companies. If any security is disqualified on this basis, it will be sold from the portfolio as soon as practical. Likewise, if any REIT newly qualifies during the year it will be added at that time.

On an annual basis, normally in the fourth quarter, the Investment Research Group repeats the entire portfolio building process. By evaluating all portfolio holdings, as well as all other REITs in the universe, for qualification and disqualification, we insure we are always investing in the sustainability leaders.

We begin by expanding the starting universe, we then re-affirm or add to our security selection criteria, and we add new datasets. -Next we update our datasets with the latest information. We then re-run the entire security selection process.

New qualifiers will be added to portfolio by the end of the year, and any disqualifiers will be removed on a tax-efficient basis. It is not expected that this re-evaluation and re-balancing of the portfolio will incur significant turnover. To date, turnover has averaged approximately 20%.

CONCLUSION

As ESG investing enters the mainstream, sophisticated investors are expanding their usage of ESG criteria across asset classes. Real Estate is a key asset class for sustainability. It plays an outsized role in our lives; as such it is a major part of the sustainability challenge, and a major opportunity.

Buildings are large consumers of energy and water, and yet they don't need to be. By implementing new, more efficient technologies, buildings can reduce not only their footprint, but their utility bills and maintenance costs. Many of these technologies improve the building's performance on the human scale as well. Buildings with better temperature control, lighting, air, etc. have happier tenants so they can charge higher rents. Many research studies confirm that greener buildings do perform better financially.

REITs are well placed to take advantage of these opportunities in buildings. Most REITs own multiple buildings of similar types so they can scale

technologies and processes across a wider cost base. By applying a Triple Bottom Line approach, they can more accurately identify what works and how profitable it will be. REITs that engage with their tenants, communities, and employees improve their rates of success.

Sustainability means different things in different industries. The experts in the real estate sector show a broad consensus on the big concerns like energy, stakeholder engagement, disclosure, bribery and corruption, etc. We determine which REITs are operating with the intention to excel in their sustainability performance and transition to a zero carbon economy by carefully selecting relevant and material metrics that reflect those concerns but that also have robust and available data. Our stringent security selection criteria result in a portfolio of REITs that have all made strong commitments to sustainability. This strategy gives investors seeking a sustainable investment strategy a solution for the real estate asset class in their portfolio that goes far beyond mechanistic or rigid investment rules resulting from a naïve allocation strategy that takes one or several available metrics at face value.

APPENDIX A: EMPIRICAL RESEARCH

Academic studies on the intersection of REITs and sustainability

Author	Paper	Objective	Findings
Eichholtz, P. Kok, N. Yonder, E.	Portfolio Greenness and the Financial Performance of REITs (2012) in the Journal of International Money and Finance	Examines the operating performance of US REITs in relation to the share of green-certified properties in their portfolios (both in terms of buildings and total certified space) and find a positive relationship between portfolio greenness and return on assets, return on equity and funds from operations of the REIT.	Finds REITs with a higher share of green properties exhibit lower market betas (14 basis point reduction for each percentage increase in the LEED share of the portfolio) no abnormal stock returns or alphas were found, which may indicate that the sustainability information and better operational performance is either already priced in or remains ignored by investors.
Sah, V. Miller, N. Ghosh, B.	Are Green REITs Valued More? (2013) in the Journal of Real Estate Portfolio Management	Analyzes the value of strategic initiatives aimed at increasing ownership of greener buildings. REITs and their management initiatives are used as a proxy.	Results show green REITs have a higher return on assets than their less-green peers. The results find a positive impact on the firm value when measured by Tobin's Q (the ratio of the market value of a company's assets (as measured by the market value of its outstanding stock and debt) divided by the replacement cost of the company's assets (book value)
McGrath, K.	Does Increased Investment in Responsible Properties Lead to Better Corporate Performance? (2014) in The Munich Personal RePEc Archive	Examines the impact of eco-certified properties has on the corporate performance of REITs.	Finds ownership of LEED certified properties had a positive impact on firm's funds from operation and return on average assets.
Hin Ho, K. Satyanarain, R. Han Lum, Y.	Green Buildings and Real Estate Investment Trust's (REIT) Performance (2013) in Journal of Property Investment & Finance	Examines whether or not the effects of 'green developments' on REITs performance is consistent across different property types specifically: office, retail and residential.	Overall, green buildings do improve the operational and financial performance of REITs. Different measurements for 'greenness' have different results.
Fuerst, F.	The Financial Rewards of Sustainability: A Global Performance Study of Real Estate Investment Trust (2015)	Analyzes the impact of sustainability initiatives measured by Global Real Estate Sustainable Benchmark (GRESB) on REITs operational performance.	Finds that REIT owners must invest in sustainability measures to remain competitive. It enhances operational performance and lowers risk exposure and volatility.
Eichholtz, P. Holtermans, R. Kok, N. Yonder, E.	Environmental Performance and The Cost of Capital: Evidence From Commercial Mortgages And REIT Bonds (2017)	Investigates the cost of capital relationship for US REITs in relation to the share of eco-certified buildings. More specifically, they analyze the spreads on commercial mortgages collateralized by real assets as well as spreads on corporate debt.	Results show that having a high fraction of eco-certified assets lowers spreads on corporate debt by around 35 basis points, all else equal. Similarly, greener REITs can issue bonds at lower spreads. Concludes that environmental performance of collateral assets is priced into financial products.