The Environment and Real Estate: How Boston Developers Are Responding to an Evolving Landscape

by

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SUBMITTED TO THE PROGRAM IN REAL ESTATE DEVELOPMENT IN CONJUNCTION WITH THE CENTER FOR REAL ESTATE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

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The Environment and Real Estate: How Boston Developers Are Responding to an Evolving Landscape

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SUBMITTED TO THE PROGRAM IN REAL ESTATE DEVELOPMENT IN CONJUNCTION WITH THE CENTER FOR REAL ESTATE ON JULY 29, 2022 IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN REAL ESTATE DEVELOPMENT.

ABSTRACT:

Today, the impacts of climate change and the effort to diminish its drivers and mitigate its consequences are disrupting the global economy. Given the inherent intersection between real estate and the economy, this disruption presents unique challenges and opportunities within the field of real estate development. In fact, the real estate industry may be at an inflection point towards a more sustainable and resilient future. Yet, with change comes confusion as stakeholders across the real estate spectrum work to respond to this emerging reality.

This paper provides a broad overview of the evolving landscape of real estate development in the Boston market as it relates to sustainability and the environment. Through its investigation, this paper seeks to elucidate how best-in-class developers in the Boston market are responding to these new market changes. Through this analysis, this paper endeavors to provide a contemporary high-level summary, albeit partial, of the intersection between real estate development, sustainability and environmental risk. The ultimate hope is that this work, and future investigations, will enable the sharing of best practices across the industry.

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Chapter 1: Introduction

1.1 Background

A clear trend across the global economy is a shift in importance to ESG initiatives as consumers and firms realize there is more to success than just their traditional bottom line. Moreover, businesses are finding that the adoption of ESG frameworks can actually improve their business as well as their impact on society. Given that energy consumption, carbon emissions and other key elements of "environment" are measurable, sustainability objectives and their outcomes are uniquely quantifiable within ESG frameworks. In real estate specifically, sustainability and environmental concerns are increasingly entering the conversations as end users, capital partners, and regulatory agencies demand more sustainable, resilient buildings.[1] This study provides a broad overview of the current landscape of real estate development in the Boston market as it relates to sustainability and the environment. Furthermore, because Boston is at the forefront of sustainability in the United States, this study of current practices in Boston is perhaps a harbinger of what is to come in markets across the country. Ultimately this paper seeks to elucidate what key elements of sustainability developers are prioritizing and what are the key drivers of those priorities. In sum, this paper endeavors to provide a current high-level summary of the intersection between real estate development, sustainability and environmental risk with the objective of sharing best practices for practitioners across the country and industry.

This paper begins by exploring the inherent intersection of climate change and real estate before establishing the growing impact of environmental and sustainability concerns on investment (Chapter 2). From there the study turns to a brief survey of the current regulatory

[1] Urban Land Institute. (2020). *Climate Risk and Real Estate: Emerging Practices for Market Assessment*.

landscape in the United States and, more specifically, the Boston market (Chapter 3). Additionally, the paper reviews benchmarks of success used within the space (Chapter 4). Taken together, this survey provides a contextual backdrop for the reader and to connect its effect on the development community.

Next, this study will explore the environmental and sustainability initiatives of several sophisticated institutional investors to better understand how allocators within the Boston market are approaching this issue (Chapter 5). Finally, the study will explore what developers are implementing today to meet this evolving market dynamics (Chapter 6).

1.2 Methodology and Structure

The thesis draws on three main sources of information: 1) a broad survey of relevant industry literature, 2) public disclosures and filings from real estate firms and 3) interviews with developers within the Boston and beyond. The interview component was restricted to developers involved in the greater Boston market.

The interview method of this study was designed as a qualitative approach predicated on a series of questions attached in Appendix A. Here, the intent was to utilize a series of strategic questions to facilitate an organic conversation that would in turn yield relevant findings. Given that the Boston real estate market is a small community, the interviews conducted have been anonymized in order to elicit more transparent feedback and to protect the participants.

The selection of interviewees was centered around firms that are active developers within the Greater Boston market spanning asset type and company size. The narrow geographic focus was chosen to better elucidate market-specific conclusions while the diversity of asset type and firm size was chosen to deliver a comprehensive, market-level perspective. Furthermore, the

author was selective in choosing interviewees that are decisionmakers at best–in-class firms in an effort to identify the best practices in the market today. In combination, the firms represented by the interviewees have developed or are currently developing approximately 30M SF within the Boston market.

This study is oriented in the Boston Market for several key reasons. First, Boston is a key gateway city that serves as a destination for sophisticated capital and is market where numerous best-in-class developers have decided to enter. Second, Boston is known as a progressive city where local, state and federal regulations are at the forefront of incorporating sustainability measures. This confluence of progressive regulation matched with institutional development and investment expertise makes Boston an appropriate market to study in order understand the current evolving trajectory of the industry. Third, and perhaps most importantly, the author lives and works in Boston.

1.3 Boston Market Overview

In 2022, the Boston real estate market remains diverse across asset classes with strong fundamentals driving continued growth. 2021 was a record-shattering year with market transaction volume reaching $2.6B– nearly $1.2B above the existing record.[2] This massive movement of capital illustrates both the strength and the attractiveness of the roughly one trillion-dollar Boston Market. In 2022, economic growth is projected to exceed 5% placing Boston in the top two major metropolitan areas in respect to growth nationally. This above-average growth is driven in large part by Boston's STEM economy which continues to boom with R&D employment growing 17% over the last two years adding nearly 14,000 high-paying

[2] *Boston Market Insights*. (n.d.). CoStar. Retrieved May 29, 2022, from https://product.costar.com

jobs to the market.[3] The continued growth of the biotech and life science industry has led to a surge of laboratory space with 10M SF of new product in the development pipeline with an outstanding inventory of 27M SF.[4] Current Covid-19 related headwinds notwithstanding, Boston's composition of industrial, office, hospitality, retail and life sciences product is positioned to benefit from strong fundamentals of continued demand and supply-constrained inventory.

Due in part to the above, Boston remains an attractive destination for international capital. According to ACFRE Survey for 2022 investment, the majority of international real estate investors plan to increase their exposure and allocation into United States real estate. Boston specifically is ranked as the third highest destination for future investment across the globe, sitting behind Atlanta and Austin, and is top primary gateway city in United States ahead of San Francisco, New York and Los Angeles.[5]

Chapter 2: The Environment and Real Estate in 2022

2.1 Context

While sustainability and climate change as concepts are not new, in recent years they have transitioned from the sidelines to the forefront of economic conversation. This change is driven by a multitude of factors but demonstrated neatly in the United Nations' International Panel for Climate Change (IPCC) evolving rhetoric and emphasis on climate change as a global economic issue. In 1995, the IPCC released their 2nd Assessment in which they wrote that, "the balance of evidence suggests a discernible human influence on the global climate".[6] In February of 2022, The IPCC released their 6th assessment characterizing the impacts of climate change has having

[3] Ibid.
[4] Ibid.
[5] AFIRE. (2022). *AFIRE International Investor Survey 2022*. https://www.afire.org/survey/2022survey/.
[6] IPCC. (1995). *IPCC Second Assessment Climate Change 1995.* (No. 2). https://archive.ipcc.ch/pdf/climate-changes-1995/ipcc-2nd-assessment/2nd-assessment-en.pdf.

already arrived and issued a "dire warning about the consequences of inaction".[7] The record forest fires along the West Coast, droughts and increased severity of extreme storms over the last several years have all crystalized the consequences of climate change on life in the United States.

Given the integral role the real estate industry plays in the global economy, sustainability and real estate are inherently interconnected. To this point, buildings account for approximately 40% of greenhouse gases (GHGs), 40% of global raw material consumption and between 30-40% of solid waste in the developed world.[8] Furthermore, global demographic patterns and the concomitant demand for additional real estate product places the sector neatly at the center of both climate change problems and solutions. This reality coupled with new investor commitment to net-zero goals, increased regulation, and growing consumer preference for sustainable real estate product collectively locates sustainability as a key pillar of the real estate industry's continued evolution.[9]

2.2 Climate Risk in Real Estate

Today, the real estate market of the United States constitutes one of the largest stores of capital in the world with the combined value of residential and commercial real estate in the United States exceeding the singular market value of common stock, corporate debt and U.S Treasury debt.[10] Fundamental to sophisticated real estate investment is the pricing of risk within those investments through various methodologies such as the Capital Asset Pricing Model. With climate change affecting daily life in the United States, and thereby real estate, new risks are

[7] IPCC. (2022). *Climate Change 2022: Impacts, Adaptation, and Vulnerability.* (No. 6th). Cambridge University Press. https://www.ipcc.ch/assessment-report.
[8] Jones Lang LaSalle (JLL). (2021, June). *Decarbonizing the Built Environment*. https://www.us.jll.com/en/trends-and-insights/research/decarbonizing-the-built-environment
[9] McKinsey & Company, Boland, B., Levy, C., Palter, R., & Stephens, D. (2022, February). *Climate Risk and The Opportunity for Real Estate*. https://www.mckinsey.com/industries/real-estate/our-insights/climate-risk-and-the-opportunity-for-real-estate
[10] Ghent, A. C., Torous, W. N., & Valkanov, R. I. (2019). Commercial Real Estate as an Asset Class. *Annual Review of Financial Economics, 11*(1), 153–171. https://doi.org/10.1146/annurev-financial-110118-123121

being introduced into the investment landscape. Additionally, evolving regulation regarding sustainability and changing consumer importance placed on sustainability has introduced an additional layer of risk within real estate investing.

2.3 Environmental Risk, Regulatory Risk and Investment Pricing:

Recent studies have demonstrated that investors across the economic spectrum are assigning increasing importance to climate-related risks recognizing the material implications they have on portfolio-level returns. While the field of study remains comparatively new and the majority of the impacts of climate change yet to be seen, there are findings that already demonstrate the financial effects of climate change on investments.[11] In other words, there is a recognition of the economic impact of climate change and movement within the investing community to adjust to this new reality reflecting "deep concerns about the effects of climate change on their portfolios."[12]

To date, this perspective has manifested in two primary reactions: the mitigation of carbon emissions and the assessment of stranded asset risk.[13] On the mitigation front, this involves the implementation of new technology, processes and materials in an effort to reduce overall emissions. By contrast, the stranded asset risk profile is much more difficult to establish given the multitude of drivers including regulatory risk, transition risk and physical risk and the difficulty of calculating their respective impacts. On this point, industry surveys have established that investors today view regulatory risks as the most material in the short-term but view "physical climate risks as the most important over the next 30 years".[14] Importantly, surveys of

[11] Krueger, P., Sautner, Z., & Starks, L. T. (2018). The Importance of Climate Risks for Institutional Investors. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3235190
[12] Ibid.
[13] Ibid.
[14] Stroebel, J., & Wurgler, J. A. (2021). What Do You Think About Climate Finance? *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3901601

the investment community find the opinion that "valuations do not fully reflect the risks from climate change" with those interviewed believing, "that asset markets are underestimating climate risks as opposed to overestimating them."[15] Here, it is important to establish that while physical risks and regulatory risk are different (See Appendix A), they often simultaneously affect assets creating two-levels of environment-related risk.

In looking to the future, many believe that pressure from institutional investors will drive continued movement towards investment that appropriately quantifies the underlying environmental risk. The intent to quantify future climate risk is difficult because it inherently rests on quantifying the financial impact of a future event. Furthermore, even if that future price tag is established accurately, the discount rate applied to bringing that cost back to present value carries significant weight. Additionally, Kruger's study suggested that, "institutional investors consider climate risks because of nonfinancial and financial reasons" and that those same investors "appear better prepared for the transition to the low-carbon economy."[16] The impact of these foundational changes is clear in the words of legendary investor and founder of Blackrock, Larry Fink who commented, "we are on the edge of a fundamental reshaping of finance."[17] This "reshaping" in finance is already felt in the market with "sustainable investing" growing in the United States 25-fold between 1995-2020, an annualized growth rate of 14%. This growth is driven in large part by professional, institution players that have identified climate change as a fundamental element of successful investment management.[18]

[15] Ibid.
[16] Krueger, P., Sautner, Z., & Starks, L. T. (2018). The Importance of Climate Risks for Institutional Investors. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3235190
[17] Urban Land Institute. (2020). *Climate Risk and Real Estate: Emerging Practices for Market Assessment*.
[18] *Report on US Sustainable and Impact Investing Trends 2020*. (n.d.). US SIF Foundation. https://www.ussif.org/trends

2.5 Environmental Risk, Sustainability and Real Estate Investment

Today the real estate industry is at an inflection point with environmental risk considerations commanding more attention and analysis. According to the Urban Land Institute and PWC Emerging Trends Report, 80% of firms are considering ESG elements when making operational and investment decisions.[19] Furthermore, given that the environmental pillar of ESG is easier to quantify and measure through better access to data, it has emerged as the primary focus for firms implementing ESG strategies.[20] At the time of this paper, the academic study of environmental risk on real estate pricing has been confined to residential homes impacted by flooding finding "the heterogeneity in beliefs about long-run climate change significantly affects the U.S. real estate market."[21] That said, surveys of best-in-class investors and developers have found that firms are "increasingly recognizing climate risk as a core real estate issue that is beginning to affect their decisions at the market level as well as the asset level."[22] This emerging trend is not just speculative—recent environmental events have already carried serious financial implications such as the credit downgrading of Trinity Public Utilities District driven by recent wildfires and Cape Town, South Africa's given recent drought.[23] Interestingly, the technology, methodology and expertise needed to accurately price environmental risk across markets and assets is still evolving therefore making it difficult for firms to accurately price environmental-related risks.[24] That difficulty notwithstanding, sophisticated firms across the real estate ecosystem are already beginning to let that risk, even if quantified imperfectly, dictate market

[19] PwC, & Urban Land Institute. (2021). *Emerging Trends in Real Estate 2022*. https://www.pwc.com/us/en/industries/financial-services/asset-wealth-management/real-estate/emerging-trends-in-real-estate.html
[20] Ibid.
[21] Baldauf, M., Garlappi, L., & Yannelis, C. (2018). Does Climate Change Affect Real Estate Prices? Only If You Believe in it. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3240200
[22] Urban Land Institute. (2020). *Climate Risk and Real Estate: Emerging Practices for Market Assessment*.
[23] Ibid.
[24] Ibid.

and asset level investment decisions.[25] Sensibly, these risks, or conversely opportunities, are not viewed in a binary vacuum, but rather components of the comprehensive risk profile of the asset or market. To this point, Heitman's Mary Lugin elaborates, "we want to make sure [environmental] pricing reflects an asset's risk and opportunity and that risk mitigants are in place."[26] While future strategies will invariably differ, the industry consensus is that environmental risk today is underpriced and will carry increasingly large consequences in the future if left unaddressed.[27]

Chapter 3: Regulatory Landscape

3.1 International

With attention turning to climate change and environmental risk across the globe, governments are implementing increasing regulation aimed at safeguarding a sustainable future for the planet. Given the integral role the real estate sector occupies in the global economy, in contextualizing real estate development today it is important to identify the different sources of regulatory pressure.

At the International level, 2015's Paris Agreement is significant in that it was the first legally binding agreement that established key objectives that have framed much of the discussion in the space. Notably, the Paris Agreement established the 2050 date for carbon neutrality which has permeated through to government and corporate action through public commitments.

[25] Ibid.
[26] Ibid.
[27] Ibid.

3.2 Federal Regulation

In the United States the most significant regulation at the federal level is the U.S. Securities and Exchange Commission (S.E.C.) proposed *"The Enhancement and Standardization of Climate-Related Disclosures for Investors."* Underneath this law proposed in March of 2022, publicly-traded companies are required to disclose their Scope 1, 2 and 3 emissions as well as the firm's exposure to potential physical and transition risks. While still in process, this bill marks a seminal change in regulation reflective of the increased prevalence of "ESG" investing and the government's desire for improved standardization and periodic reporting. Should this new law be enacted as proposed today, publicly traded real-estate companies will be forced to respond to the new requirements. Of arguably larger consequence however is that non-real estate publicly-traded companies will need to understand the risks and emissions associated with their physical footprint both owned and leased in the commercial real estate market. Therefore, real estate operators will soon be tasked with providing emission and risk information to tenants that are publicly-traded. Additionally, in May the SEC also proposed a new rule that would mandate ESG disclosures from private fund advisors.[28]

In a similar vein, in May of 2022 the SEC charged BNY Mellon with ESG-related misstatements and omissions with resulted in a $1.5 million penalty, the first of its kind.[29] This penalty is a key inflection point for ESG investing with the SEC assigning material value and significance to firms utilizing the terminology.

[28] Kirkland & Ellis. (2022, June). *SEC Proposes Enhanced Disclosure by Certain Advisers on ESG Investment Practices*. https://www.kirkland.com/publications/kirkland-aim/2022/06/enhanced-disclosure-on-esg-investment-practices

[29] U.S. Securities and Exchange Commission. (2022, May 23). *SEC.gov | SEC Charges BNY Mellon Investment Adviser for Misstatements and Omissions Concerning ESG Considerations* [Press release]. https://www.sec.gov/news/press-release/2022-86

3.3 State Regulation

At the state level, Massachusetts has several key elements of regulation that impact the development of real estate. First, in 2021 Governor Charlie Baker passed the 2021 Climate Act that notably committed to the state reducing greenhouse gas emissions by 50% below 1990 levels before 2030 and achieving net zero emissions by 2050. Included in this program were sector specific emission targets aimed at commercial and industrial buildings as well as residential buildings. This bill also identified a new building stretch code, which is still being finalized, layering on additional requirements for building codes should local governments (i.e. towns) opt in. As of June 2022, 299 of 351 communities within the state have opted in affecting over 90% of the Massachusetts's population. Of specific relevance to development was the bill's adoption of California's energy efficiency standard for household appliances. Finally, the bill included a provision that expanded the Massachusetts Environmental Policy Act (MEPA) review for new projects to require developers to disclose project-level climate change adaptation and resiliency strategies.

Also, at the state-level is The Massachusetts Public Waterfront Act also known as "Chapter 91" which dates back to the 17th century when it was established to preserve public access to waterfront and protect coastal areas.[30] The doctrine's protection of intertidal zones has become more complicated with sea-level rise moving the intertidal boundaries today and into the future. Under the purview of the Massachusetts Department of Environmental Protection, development within coastal zones must undergo the DEP's licensing process designed to ensure proposed development doesn't compromise the waterfront's public benefit.

[30] Kiefer, M., & Giannakis, L. (2018). Navigating Rising Waters: The Public Waterfront Act. *Boston Bar Association*, *62*(2). https://bostonbar.org/journal/navigating-rising-waters-the-public-waterfront-act/

3.4 City Regulation

Boston has positioned itself at the forefront of progressive city-level, climate-related policy with its established 2030 zero net carbon standard for new buildings and a target of carbon neutrality of 2050 for all buildings.[31] As a function of this policy, there is Boston's Building Emissions Reduction and Disclosure Ordinance (BERDO) which mandates energy and water use reduction and reporting for buildings over 20,000. While BERDO's full implementation is phased with its full weight coming in 2025, it carries significant monetary policies for buildings that fail to meet it standards–- penalties that are both fixed daily rates for noncompliance as well as calculated off of quantity of excessive emissions.[32] The impact of BERDO is that Boston's building performance standards are more restrictive than those at the state level.

From the international to city level, the last decade has brought a wave of new environmental regulation that has only accelerated in recent years. Prior to year of this paper, 2022, progressive environmental regulation had largely been enacted at the state and city level with local governments such as New York City and Washington DC implementing similar policies as Boston' BERDO. That said, it is possible 2022 will become a watershed year for environmental regulation at the federal level with the SEC's first ESG-related penalty levied and the proposed disclosures that, if enacted will carry serious ramifications for the economy at large and real estate specifically. This regulatory momentum is likely to continue its trajectory which will continue to impact real estate development in Boston and beyond.

[31] Jones Lang LaSalle (JLL). (2021, June). *Decarbonizing the Built Environment*. https://www.us.jll.com/en/trends-and-insights/research/decarbonizing-the-built-environment

[32] Building Emissions Reduction and Disclosure. (2021, September 29). *Building Emissions Reduction and Disclosure*. Boston.Gov. https://www.boston.gov/departments/environment/building-emissions-reduction-and-disclosure

Chapter 4: Benchmarks of Success

4.1 Overview

With the business community and governments placing more emphasis on ESG initiatives, there is a growing need for frameworks, certifications and rating systems for organizations to benchmark their initiatives. Unsurprisingly, there is an increasingly large number of different organizations, all with slightly different angles, that are looking to provide measurement and standardization to this expanding field. As this dimension of the business continues to mature, it will be interesting to see the consolidation of these benchmarks in turn yielding a more straightforward compass for progress.

4.2 Frameworks

Frameworks are being used within commercial real estate to compile, quantify and disclose information relevant to firm's ESG and climate-related operations and strategies. Put simply, frameworks are the structure against which firms report.

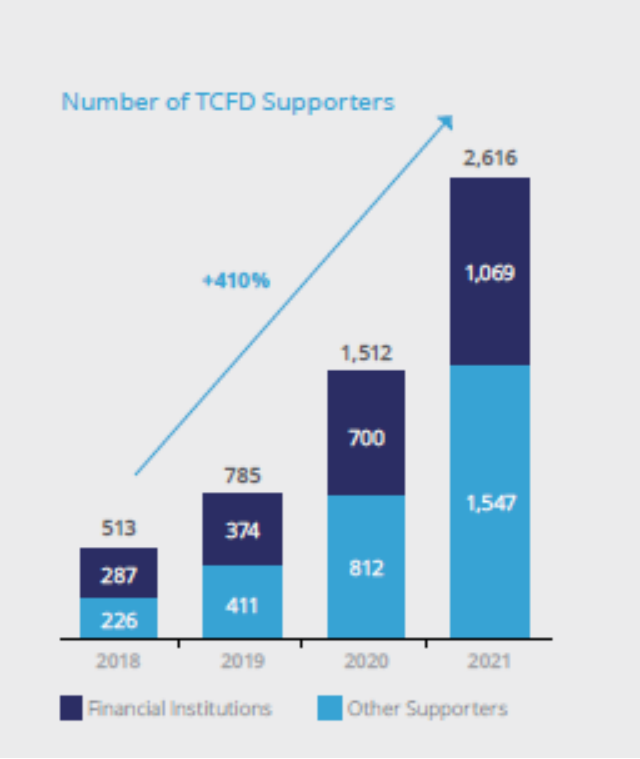
Today, there are three principle frameworks that are utilized within the sector. First, is the Sustainable Finance Disclosure Regulation (SFDR), established by the European Union, which establishes and mandates an ESG reporting methodology for firms engaging in the EU capital markets.[33] Beyond requiring standardized disclosures on ESG Factors, the SFDR also mandates that public companies identify their plan to mitigate the negative impact of their investment activity on the environment.

At the international level, the Task Force on Climate-Related Financial Disclosures (TCFD) was created to "price risk to support informed, efficient capital-allocation decisions."[34] This

[33] Davis, A. (2022, February 2). *Five ESG Frameworks Real Estate Owners Need to Know In 2022 and Beyond*. Measurabl. https://www.measurabl.com/five-esg-frameworks-real-estate-owners-need-to-know-in-2022-and-beyond/
[34] Task Force on Climate-related Financial Disclosures. (2021, October). *2021 Status Report*. https://www.fsb-tcfd.org/publications/

financially-driven disclosure methodology has been adopted by the majority of the world's largest companies and orients on the identify of climate-related risks and opportunities. Over the last several years, adoption and support of the TCFD has grown dramatically with countries such as the United Kingdom, Switzerland and New Zealand implementing the framework at the national level. Figure 1 below illustrates this trend clearly illustrating the dramatic growth of TCFD supporters over the last 4 years bringing the AUM of TCFD-aligned firms to $194 trillion.[35]

Figure 1:

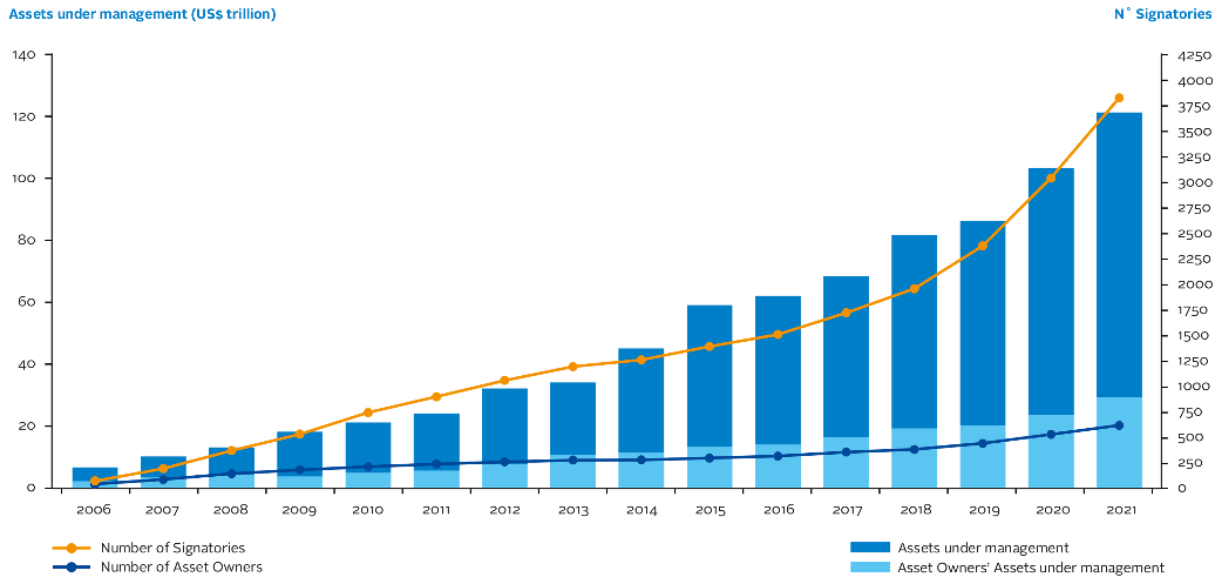


Note:
Dark blue column represents financial institutions that support TCFD.
Light blue column represents other supports of TCFD.
Source: Task Force on Climate-related Financial Disclosures

[35] Ibid.

Finally, the United Nations' Principles of Responsible Investment (PRI) is an initiative focused on promoting sustainable investment policy globally through responsible investing and collaboration. In committing to the PRI, signatories pledge to implement ESG initiatives throughout their business and report on their progress towards those initiatives. As the Figure below illustrates (Figure 2), membership in the PRI continues to climb annually representing today over $120T in assets under management.[36]

Figure 2:



Note:
Dark blue column represents the Assets Under Management (AUM) of PRI signatories.
Light blue column represents Asset Owner's AUM of PRI signatories.
Orange line represents the number of PRI signatories.
Blue line presents the number of asset owners that are PRI Signatories.
Source: Principles For Responsible Investment.

[36] Principles for Responsible Investment. (2022, January). *Annual Report 2021*. https://www.unpri.org/about-us/about-the-pri.

4.3 Building Certifications

At the asset-level, the in Boston the real estate industry has oriented around three principle building certification systems that verify the building's environmental and energy standards. First, is the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification which was created by the U.S. Green Building Council. The LEED system is a tiered-program with buildings ranks determined off of the asset's carbon emissions, energy consumption, climate resiliency and other metrics.[37] Given its roots in the United States, LEED certifications are very prevalent in Boston with Massachusetts ranking as the third state with the highest LEED project certification with 19 million square feet.[38] Across the Atlantic, the United Kingdom created The Building Research Establishment Environmental Assessment Method (BREEAM) standard that orients off of similar criteria but is distinct in that it requires a 3rd party assessment for certification. Finally, the United State's Environmental Protection Agency created the Energy Star Certification which verifies that buildings are meeting the agency's energy performance standards and performing better than 75% of building nationwide.[39]

While the three certification programs mentioned above are the most widely adopted, today there are several other programs in use that also look to standardize performance and prevent the greenwashing of assets. Given the multitude of variables and inputs that make a building "sustainable" or "efficient" one can imagine how different criteria and their quantitative weighting leads to a myriad of options in the marketplace.

[37] *Why LEED certification | U.S. Green Building Council*. (n.d.). USGBC. Retrieved May 29, 2022, from https://www.usgbc.org/leed/why-leed
[38] *Top 10 states for LEED in 2021 | U.S. Green Building Council*. (n.d.). USGBC. Retrieved May 28, 2022, from https://www.usgbc.org/top-10-leed
[39] *ENERGY STAR Certification for Buildings*. (n.d.). ENERGY STAR. Retrieved June 28, 2022, from https://www.energystar.gov/buildings/building_recognition/building_certification

4.4 Rating Systems

With more frameworks and certifications being implemented across the economy, ESG and sustainability rating systems have emerged to quantify and qualify companies' ESG performance. The Morgan Stanley Capital International (MSCI) is an international research firm with its own ESG rating scheme aimed at accessing "a company's resilience to long-term, financially relevant ESG Risks."[40] Using a combination of available data, company disclosures and government databases, MSCI rates firms on 35 ESG issues and that total weighted average leads to a score that is relative to the ESG rating of industry peers (Industry-Adjusted Score).[41]

Sustainalytics, a Morningstar Company, looks to empower investors with the ability to identify and quantify ESG-related risks within their portfolio. Sustainalytics' rating methodology is twofold, first it establishes the firm's exposure to ESG-related risks, an analysis that is both firm and industry specific, before matching that exposure with the firm's ability to manage and mitigate that risk. This analysis leads to an ESG Risk Rating that ranges from negligible to severe as well as Management of Risk score which indicates the percentage of the controllable risk that has been managed.[42]

Tailored specifically for the real estate industry, is the Global Real Estate Sustainability Benchmark, or GRESB which was launched in 2009. GRESB's rating system is oriented off three ESG elements: management, performance and development with a methodology that aligns with several international frameworks including the TCFD and the PRI.[43] Participating firms are

[40] MSCI ESG Ratings Methodology
[41] MSCI ESG Ratings Methodology
[42] Sustainalytics. (2020, October). *THE ESG Risk Rating: Frequently Asked Questions for Companies*. https://connect.sustainalytics.com/brochure-esg-risk-rating?
[43]https://documents.gresb.com/generated_files/real_estate/2021/real_estate/reference_guide/complete.html#overview_of_GRESB_assessments

evaluated on approximately 15 different elements such as risk assessment, energy usage and GHG emissions. A review of the scoring model illustrates that the asset-level performance is weighted heavier than the management, with Energy, Building Certifications, and Stakeholder Engagement being the top categories as percentage of the total score. Finally, in order to compile the information necessary to establish the above, GRESB relies on a substantial submission process and questionnaire by the respective firm that then is put through a verification process by GRESB. This required participation distinguishes the GRESB system from MSCI and Sustainalytics which do not require firm input for their respective ratings but rather rely on data and disclosures that already exist in the public domain. GRESB participation continues to climb dramatically and in 2021 there were over 1,520 real estate firms participating in the benchmark representing nearly $6 trillion of AUM.[44]

4.5 Benchmarks of Success: Summary

As the survey above demonstrated, there is a multitude of interwoven frameworks, building certifications and rating systems all attempting to quantify ESG initiatives within commercial real estate and the global economy at large. Given this varied landscape which continues to evolve with amended methodologies and new ones alike, it is important to understand the alignment of relevant stakeholders and understand that the key drivers and priorities behind the initiatives. That said, it is clear that industry adoption continues to grow across alignment to the TCFD and participation in GRESB demonstrating the significant shift within the industry. Moving forward, the collection of data needed to measure and manage the respective metrics will be a fundamental part in advancing ratings and benchmarking success.

[44] GRESB. (2021, October 15). *2021 GRESB Results Show Record Growth in Infrastructure and Real Estate Participation*. GRESB.Com. https://www.gresb.com/nl-en/insights/2021-gresb-results-show-record-growth-in-infrastructure-and-real-estate-participation/

Chapter Five: Allocation of Equity

5.1 Overview:

In order to understand what developers are delivering to the Boston market, this study starts with an exploration the priorities and motivations of the allocators of equity. In other words, to understand what supply is being delivered, the investor demand is first explored. As mentioned above, equity gravitating towards sustainable investments within the real estate sector has been growing at a record-breaking pace. As a proxy of market sentiment, the below summarizes key strategies and commitments by several of the largest real estate investment firms in the world that are active in the Boston market.

5.2 Brookfield:

Brookfield Asset Management is one of the largest investment firms in the world with an AUM of approximately $700 Billion, $200B of which is dedicated to real estate. The majority of Brookfield's investments are within North America with a sizeable presence established within the Greater Boston market across asset classes. Notably, in the fall of 2021, Brookfield entered into a one and a half billion-dollar partnership with Boston-based King Street Property, furthering their foothold within the market and the life sciences sector.[45] With respect to reporting, Brookfield is affiliated with PRI and TCFD, among others, with several of its real estate businesses participating in GRESB ratings. Additionally, ESG considerations are integrated into the firm's investment process from due diligence, investment committee, operation and exit. Looking forward, Brookfield committed to net-zero emissions by 2050 and

[45] Properties, K. S. (2021, September 15). *Brookfield Forms Strategic Partnership with Boston-Based King Street Properties* [Press release]. https://www.prnewswire.com/news-releases/brookfield-forms-strategic-partnership-with-boston-based-king-street-properties-301377715.html

established the Brookfield Global Transition Fund of $15B dedicated to investing in companies decarbonizing their operations. Brookfield's commitment to achieving net-zero facilitated the firm's status as a signatory to the Net-Zero Asset Managers Initiative, a collection of nearly 300 asset managers with over $60 Trillion in AUM, all aligned on achieving net zero by 2050[46]. At the asset level, Brookfield's certifications are heavily favored towards LEED and Energy Star as well as BOMA and IREM to a lesser degree.[47] Fundamentally, Brookfield believes "the transition to net-zero represents an enormous investment opportunity" that will require the "potential rewiring of virtually every industry."[48]

5.3 Nuveen:

Nuveen Real Estate, the investment management arm of TIAA Company, controls over $400 billion worth of real estate with a sizeable Boston office and holdings throughout the city. In Nuveen's Outlook for Real Estate: Five Themes for 2022, the firm suggested that the "structural changes in demographics, technology and sustainability sit at the core of its investment strategy."[49] Nuveen discloses against the TCFD framework but has acknowledged the void of standardized reporting as it relates to predicting and quantifying financial risk driven by climate change. To this point, Nuveen deploys the Verisk Maplecroft platform to access their portfolio's exposure to climate change related events in the future. Furthermore, Nuveen has integrated this attention to evaluating climate change risks into the investment process to ensure

[46] *Signatories – The Net Zero Asset Managers initiative*. (2022, May 31). Https://Www.Netzeroassetmanagers.Org/. Retrieved June 6, 2022, from https://www.netzeroassetmanagers.org/signatories/
[47] Brookfield Asset Management Inc. (2022, May). *2021 ESG Report*. https://www.brookfield.com/responsibility/2021-esg-report
[48] Brookfield Asset Management Inc. (2022, February). *2021 Annual Report*. https://www.brookfield.com/about-us/2021-annual-report
[49] Nuveen A TIAA Company. (2021, December). *Real Estate 2022 Outlook*. https://www.nuveen.com/en-us/insights/real-estate/real-estate-outlook-2022

that any such risks are captured in the asset-level business plan.[50] With regards to benchmarking, Nuveen primarily utilizes the GRESB rating, PRI and Energy Star[51]. In 2020, Nuveen committed to aligning with the Urban Land Institute's Net Zero by 2050 Goal citing that alignment with the Paris Accords, "will deliver outperformance for our clients as net zero carbon buildings will be protected from obsolescence and will remain relevant.[52] Throughout Nuveen's Annual Report 2021 on Responsible Investing Stewardship, exists an emphasis on the importance of pricing in climate-related risk and the perspective that firms that introduce net-zero strategies will benefit from business plan resiliency and a growing spread between green premiums and brown discounts of buildings[53].

5.4 Norges Bank Investment Management

Norway's sovereign wealth fund, Norges Bank Investment Management, is one of the largest investment funds in the world with a value of approximately one point three trillion dollars, with 60 billion dollars allocated specifically to real estate.[54] Norges $60 billion-dollar global real estate portfolio is distributed across office, retail and industrial assets with the majority of their holdings in the United States. Given Norges' investment emphasis on global cities, Boston is a top destination for the firm's capital with the city attracting the largest investment globally in 2021 at nearly 900 million dollars. [55] Over the last decade, Norges has positioned itself as a champion of sustainable investment with the firm focusing on the environmental impact of its portfolio. Reporting against the TCFD, Norges leverages its

[50] Nuveen A TIAA Company. (2021, July). *Investing in Tomorrow's World: Real Estate Sustainability Report*. https://www.nuveen.com/en-us/insights/responsible-investing/investing-in-tomorrows-world-real-estate-sustainability-report
[51] Ibid.
[52] *ULI Greenprint Goals*. (2022, April 22). ULI Americas. https://americas.uli.org/research/centers-initiatives/greenprint-center/greenprint-resources-2/uli-greenprint-goals/
[53] Nuveen A TIAA Company. (2021, December). *Real Estate 2022 Outlook*. https://www.nuveen.com/en-us/insights/real-estate/real-estate-outlook-2022
[54] Norges Bank Investment Management. (2021). *Government Pension Fund Global Annual Report 2021*.
[55] Norges Bank Investment Management. (2021). *Responsible Management of Renewable Energy Infrastructure*.

expansive portfolio and deep pockets to improve the sustainability agendas and climate-risk awareness in the firms they are investing in. To this point, in 2021 the firms held over 2600 meetings at over 1000 companies in order to better understand firms' respective approaches to sustainability issues. Additionally, Norges publishes their "expectation documents" which establish how they "expect companies to manage various environmental and social matters."[56] A review of these expectation documents and the firm's annual report reveals that carbon emissions and more specifically, preparedness to transition to a low-carbon economy, is a top priority for Norges.[57] At the asset-level, Norges utilizes the GRESB benchmark to track success and improvement of sustainability initiatives in the firm's real estate portfolio. In the firm's 2021 report, Norges highlights their joint venture with Hines in New York City, 555 Greenwich Street, in which they are deploying a four-pronged strategy to reduce emissions from the heating and cooling of the building. Beyond climate considerations, the firm articulates the belief that a reduction in carbon emissions will lead to lower operating expenses, risk and higher valuations in the future, especially as tenants increasingly seek out low emitting buildings.[58]

5.5 Allocation of Capital Summary:

While the above illustrates the importance Brookfield, Nuveen and Norges are placing on sustainability and environmental risk, they are not the only Boston-focused investors doing so as they are just part of a much larger trend. To this point, PSP Investments, WS Development's capital partner in the Boston Seaport, the largest project in the city's history, is focused on reducing emissions and improving portfolio resiliency citing "research shows that corporations

[56] Norges Bank Investment Management. (2021). *Responsible Management of Renewable Energy Infrastructure*.
[57] Norges Bank Investment Management. (2021). *Government Pension Fund Global Annual Report 2021*.
[58] Norges Bank Investment Management. (2021). *Responsible Management of Renewable Energy Infrastructure*.

that are actively managed and plan for climate change can secure a higher return on investment."[59] This trend is not just constrained to Boston and it is becoming clear that sophisticated investors are placing real value and analysis on environment-risk and sustainability considerations.[60]

Chapter 6: Interviews with Boston Developers

6.1 Commitment to Sustainability

The majority of the firms represented by the interviewees have publicly made commitments to sustainability and the environment at the corporate level. While the commitments and objectives varied by firm, reducing carbon emissions was a top priority and a common thread. Two interviewees shared that their firms are focused on achieving carbon neutral emissions by 2025, while another is anchoring of a 2035 net-zero carbon goal. Additionally, while two of the firms did not have a concrete, published sustainability strategy, both interviewees were quick to establish the firm's high-level commitment to such initiatives and provided clear examples of that commitment manifesting in action. Interestingly, both of these interviewees made the point that in positioning their firms as best-in-class developers, a commitment to sustainability came as a natural component. In sum, all of the participants and their respective firms are keenly focused on sustainability and environmental risks and view both as important elements of their business models.

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[59] PSP Investments. (2022). *Investing for a Better Tomorrow Public Sector Pension Investment Board*. https://www.investpsp.com/en/investment-performance/reports

[60] PwC, & Urban Land Institute. (2021). *Emerging Trends in Real Estate 2022*. https://www.pwc.com/us/en/industries/financial-services/asset-wealth-management/real-estate/emerging-trends-in-real-estate.html

6.2 Role of Environmental Risk

All of the interviewees expressed that environmental risk plays a material role in the investment and development of each asset within the company's portfolio. One key message expressed by several interviewees was the importance of engaging expert consultants to identify and quantify environmental risks. Two interviewees highlighted the utility of Moody's ESG Solutions Group which provides clients the ability to assess asset-level physical and transition risks. Similarly, another interviewee spoke to the importance of leveraging a quality hydrologist to understand the impact regional sea-level rise will have on the water table in an effort to build effective, resilient structures. Additionally, the notion of translating the accessed environmental risk into nuanced and actionable measures at the asset-level was expressed several times as a fundamental step to creating resilient and sustainable buildings. Here, the notion was that small differences in location and implementation can create large long-term impacts for the building. Fundamentally, all interviewees made it clear that their firms are incurring extensive costs early in the development process in order to design and construct buildings that will be better positioned to mitigate future environment-related risks.

6.3 Drivers of Environment-related Strategy

When asked to identify the key drivers in the firm's environment-related strategy, the answers varied given the diversity of size and product type of the interviewee pool. That said, there were several shared elements across the responses. First, all respondents made it clear the regulation, whether it be at the federal, state or local level, is an important consideration when it comes to the firm's strategy. Boston's BERDO 2.0, explored above, was identified explicitly as a driver for several firms to implement measures in order to avoid penalties stemming from its implementation. In commenting on the impact of regulation several of the interviewees also

expressed that, given the pace of regulatory change and the other drivers addressed below, their firms are implementing measures beyond the regulatory minimums that exist today. In fact, one interviewee made the point that if one is developing just to satisfy the existing regulatory standard there is a risk of the market advancing further on the adoption curve, in turn creating additional market risk for that asset. In other words, while a crucial consideration and driver for the firms, regulation is often not the leading factor in the firms' decision-making but rather part of the overall equation.

All interviewees, except for one, cited investor sentiment as an important factor driving the firm's strategy and implementation. One interviewee expressed that their primary equity investor would only consider projects with a significant sustainability element regardless of investment return profile. Another interviewee shared that the firm's recent ESG strategy and objectives, which were published publicly, was driven by the firm's reliance on institutional equity investors and their increasing appetite for sustainable real estate product. Several interviewees commented on the fact that while investor environmental considerations in the past were accessed at a largely superficial level, investor engagement and sophistication has evolved dramatically in the last 24 months leading to more extensive and advanced expectations. One interviewee highlighted that this investor sophistication on environmental considerations was especially true with European firms. On the debt side, the interviewees are not seeing the same level of attention to sustainability as on the equity side, the exception being the issuance of green bonds where two participants spoke to their respective firm's success raising such debt.

Nearly all interviewees expressed that tenant demand is a strong driver for their firm's sustainable development programs. Several interviewees shared that while always an important consideration, over the last twelve to eighteen months tenants have become much more focused

and sophisticated when it comes to building sustainability programs and what they are requesting. One interviewee highlighted that a recent building's net-zero status was a crucial part of attracting the asset's future tenant. The majority of the interviewees spoke to the fact that their firm's business models in large part rely on institutional tenants occupying space who increasingly are making substantial ESG commitments at the corporate level and are now looking for real estate that aligns with those commitments. It was clear the majority of interviewees view this as a trend that will continue into the future and as such, their firms are developing space with that at the forefront of their strategy.

Lastly, several of the interviewees identified that they, and their firms, believe developing sustainable, resilient real estate is just "the right thing to do" and therefore has become an important element of their firm's DNA. Similarly, one interviewee spoke to the fact that their firm views excellence in sustainability as a tool to both attract and retain best-in-class employees.

6.4 Implementation

In terms of implementing sustainable and environmental frameworks, benchmarks and rating systems, each interviewee provided a different perspective. Collectively, the participants shared a recognition of the multitude of options and looked for the mutual alignment in the selection process between the respective program and the firm's environmental strategy and goals. Moreover, the majority shared that their selection was often driven by tenant and investor demand as well as what their competition was deploying; put simply, responding to client needs and competition. Two interviewees called out the LEED framework specifically as not just a helpful accreditation in the market but also a helpful guide used to help drive the planning and design of a building. In the segment interviewed, the larger firms utilized a larger number of

frameworks, benchmarks and ratings which is a sensible finding given the cost and resources needed to do so.

In respect to key elements of asset-level implementation all interviewees commented on the importance of the thermal energy source of the asset with full electrification, or the flexibility to convert to full electrification, as a key priority. Additionally, several interviewees spoke to the importance of the building envelope and utilizing building systems that facilitate efficient energy consumption. This notion of efficiency extended throughout all interviews with LED lighting, low-flow fixtures and technology at large all being referenced as opportunities to reduce consumption. On the environmental-risk front, two interviewees spoke to the importance of ground level programming given Boston's exposure to sea-level rise and storm surge. Lastly, as expressed partially above, all interviewees indicated that their implementation strategies revolved heavily on a team of external consultants that are experts in their respective fields.

6.5 Challenges

First, the majority of interviewees commented on the recent evolution of the space as a challenge (and opportunity) given the pace at which regulation and market demand been changing over the two years. This pace of evolution and the multiyear timeline of large development projects has led to a challenging assessment for the interviewees when it comes to determining what sustainability and environmental risk initiatives should be deployed into a given project.

The majority of interviewees commented that identifying the financial return from sustainability measures is difficult to do within traditional 10-year investment horizons. That said, with the majority of the interviewees' firms oriented towards a long-term investment

horizon, the participants expressed an easier path to financial justification for upfront costs in light of mitigating significant expenses in the future. Furthermore, while difficult to link explicitly, several interviewees expressed the cost as a necessity when competing for the most sophisticated tenants in the market and that not doing so would place the asset at risk of functional obsolescence. One interesting exception was one firm that over the last several years had heavily committed to renewable energy contracts across its operational portfolio, a commitment that led to millions of dollars of savings given recent energy prices in the spring and summer of 2022.

6.6 Predictions for the Future

The majority of interviewees predicted that the industry's focus on carbon emissions will only continue to gain momentum with several predicting that net-zero buildings will move from the innovative to the commonplace in a matter of years. To this point, several interviewees predicted that there will be a "flight to quality" within sustainable real estate product with end users and financiers prioritizing sustainable, resilient buildings. Furthermore, three participants suggested that environmental-risk and climate modeling will become a more important part of the investment and development process.

While the majority of the interviewees cited electrification as a continued trend into the future of development in Boston, half of the interviewees expressed concerns about the mismatch between future demand for electricity and the city's existing infrastructure.

Finally, the majority of interviewees highlighted reporting as a continued trend citing the SEC's recent proposal and increased corporate commitments to carbon emissions.

Chapter 7 Conclusion

7.1 Key Findings

With the impacts of climate change affecting daily life with increasingly regularity and severity, it is evident to the author that the world's economy is at the beginning stage of a monumental shift towards a more sustainable equilibrium. This shift will occur as society works to reduce the likelihood of future climate change while mitigating its current, and forthcoming, impacts. Given that real estate houses the global economy and is responsible for such a large share of emissions, it follows that this shift will carry massive implications on the industry.

While there is a dearth of financial literature academically proving this to be the case in real estate specifically, it can be argued that is due to the fact that it is occurring today, in the future the backward-looking summary will be very clear. The evolving regulatory landscape and shifting priorities of equity investors are likely harbingers of more widespread change that will impact the real estate industry and global economy for decades to come. To this point, the recent rapid proliferation of GRESB, PRI, TCFD and other others suggests that the wave of adoption is well underway. In the interviews articulated above, it is evident that within the Boston real estate market, best-in-class developers delivering institutional-quality real estate are already extremely focused on this shift and anticipate its continued growth in years to come.

The key lessons distilled from the developers profiled are to, within economic reason, make the capital investments today to avoid future costs whether they be regulatory penalties, market obsolescence, increased energy costs and actual physical damage to buildings. To this point, the most sophisticated developers today are incorporating building design and systems that afford

long-term resiliency and flexibility. In order to achieve this end goal, developers are engaging with expert advisors and consultants that are helping to guide the process. This effort will no likely be hindered and complicated but the industry's capital-intensive nature, fragmented ownership and historically conventional leadership.

Future success will be there for developers who continue to develop product that resonates with their customers, whether that be tenants or investors, and the trick will be to stay ahead of the curve and develop the right product at the right time. In that sense, the industry is changing while it simultaneously remains the same.

7.2 Limitations and Scope for Further Research

This study was designed to be a comprehensive summary of the current landscape at the time of writing, summer of 2022. That said, given the length of this work and the complexity of the field it is inevitably a cursory overview that thereby warrants future research and investigation. To this point, the interview pool was limited and could be greatly increased to include not just additional developers but also other stakeholders within the real estate development ecosystem including, but not limited to, city planners, design consultants, and lenders. Additionally, this paper oriented itself on ground-up development but neglected to deeply explore the operational side of the business which, as the reader likely knows, represents the majority of the real estate footprint today. Also, for reasons stated above, this paper centered on just the Boston market and as such additional investigation is warranted beyond just "The City on the Hill." Finally, as the global economy continues to respond to climate change there will be undoubtedly additional quantitative and qualitative information for a future researcher to utilize in pursuit of a more comprehensive investigation.

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Appendix A: Definitions

ESG: Environmental, Social and Governance.

Sustainability: A dynamic process that guarantees the persistence of natural and human systems in an equitable manner.[61]

Climate Resiliency: "the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events."[62] In this context, related to climate.

Green House Gases (GHGs): Gases, such as carbon dioxide and methane, that trap heat within the Earth's atmosphere.

Embodied Carbon: carbon emissions associated with the construction of a building and the extraction, transportation, manufacturing and installation on all the building's material.[63]

Operational Carbon: the carbon emitted from a building's ongoing operation.

Stranded Asset Risk: Assets exposed to devaluations or conversation to 'liabilities' because of unanticipated changes in their initially expected revenues due to innovations and/or evolutions of the business context, including changes in public regulations at the domestic and international levels.[64]

Transition Risk: "Potential changes in policy landscape, technology, and other market forces, in response to climate change that affect the real estate and land use industry."[65]

Physical Risk: Direct risks posed to an asset from climate change. Can be acute such as a severe storm or gradual such as sea level rise.

Regulatory Risk: Risk that derives from changing regulations that affect the business viability of the asset.

[61] IPCC, 2018: Annex I: Glossary [Matthews, J.B.R. (ed.)]. In: *Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming…* Masson-Delmotte et all. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 541-562, doi:10.1017/9781009157940.008.
[62] Urban Land Institute. (2020). *Climate Risk and Real Estate: Emerging Practices for Market Assessment*.
[63] McKinsey & Company, Boland, B., Levy, C., Palter, R., & Stephens, D. (2022, February). *Climate Risk and The Opportunity for Real Estate*. https://www.mckinsey.com/industries/real-estate/our-insights/climate-risk-and-the-opportunity-for-real-estate.
[64] IPCC, 2018: Annex I: Glossary [Matthews, J.B.R. (ed.)]. In: *Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming…* Masson-Delmotte et all. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 541-562, doi:10.1017/9781009157940.008.

[65] Urban Land Institute. (2020). *Climate Risk and Real Estate: Emerging Practices for Market Assessment*.

Appendix B:

Interview Questions:

1. Does the company have an ESG strategy, mandate or goal? If so, is it public (to investors or clients)?
2. How does the firm define the "Environment" component of ESG and sustainability?
    a. What are the ``E'' goals in the company development practices? Are they already implemented or are there plans to implement in 2030, 2050, etc.?
        i. Does the firm contemplate operational carbon in their environmental efforts?
    b. Does the firm contemplate embodied carbon in their environmental efforts?
3. How does the firm engage with sustainability/environmental issues at the Corporate Level?
4. How does the firm think about environmental risks? Climate-related, physical and transition risk.
    a. Does the firm have systematic approach to identifying and/or quantifying those risks?
        i. If so, what does that approach prioritize/focus on?
5. Has the firm made environmental/sustainability commitments/objectives at the corporate level?
6. What are the biggest motivators for sustainability/environmental initiatives at the asset level. Please rank from most to least important.
    a. Regulation (e.g. comply with rules like BERDO in Boston)
    b. Permitting/Entitlements
    c. Attracting new clients
    d. Access to capital: Equity Partners
    e. Access to capital: Debt
    f. Operational Strategy
    g. Other?
7. What is the rubric/framework for sustainability that the firm uses to ensure that the buildings that you develop/own/operate are performing well in E?
    a. Why that framework?
8. How does implementation manifest at the asset-level?
    a. What does success look like?
        i. Does the firm's development portfolio include projects that are aligned with green building standards?
        ii. Does the firm's development portfolio include projects that are obtained or are will obtain a green building certificate?
    b. What are the key components?
        i. How is that implementation monitored?
            1. Technology?
            2. Personnel?
            3. Consultants?

ii. To what Extent.

9. Does this environmental strategy have a financial impact on the asset (positive (e.g. better company reputation, easier access to capital, easier disposition of assets or more valuable assets) or negative (e.g. higher costs))? If yes, what is the financial impact of the implementation?
10. What is the biggest obstacle(s) in implementing the initiatives at the asset level?
11. What, if any, are new sustainability/environment-related initiatives that have been implemented recently and are likely to stay?
12. What changes do you see your firm implementing, as it relates to sustainability and environmental risks, five years from now?
13. What is the role of regulation in your E strategy? Does it support or hinders your E practices?

Alternative Section (if there is no environmental strategy):

1. If no Environmental Strategy, are there plans to implement one?
    a. If not, why?
2. Are there any measures that are being implemented at the asset level that could be considered sustainable? If so, what is the motivation?
    a. LED Lighting?
    b. Improved Building Envelope?
    c. Other?
3. Has this lack of environmental strategy hindered the firm's business?
4. If your competitors start (or continue) to implement environmental strategies, how will the firm respond?
5. Do you think the firm's stance will change in the future?

Appendix C:

Schedule, Format and Length of Interviews:

Interview 1: 6/24/2022. Zoom Interview. 30 minutes.
Interview 2: 6/24/2022. Zoom Interview. 45 minutes.
Interview 3: 7/10/2022. Phone Interview. 30 minutes.
Interview 4: 7/11/2022. Zoom Interview. 55 minutes.
Interview 5: 7/13/2022. Zoom Interview. 40 minutes.
Interview 6: 7/15/2022. Zoom Interview. 60 minutes.

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