

JOINT CALL TO ACTION

Building Transition: Financing Market Transformation

Alliance
HOE
GBC FRANCE



Green Building
Council Australia



Letter from the CEOs

Since announcing the international alliance of our five green building organizations, we have focused on how the built environment can unlock the sustainable finance needed for the sector to meet our global climate goals. We believe that investors, property owners, developers and governments must have the information they need to enact transformational change in the built environment.

The first phase of our work began this summer during London Climate Week with the launch of our first guide that outlined how the world's foremost sustainability rating systems are aligned and how we can ensure that all buildings transition to a decarbonized future. The report outlined how integrating major building certification systems like BREEAM, HQE, LEED, Green Mark and Green Star can provide a framework for unlocking capital for green projects.

The next phase in our alliance builds on our last report and dives into how we can expand green building activity within non-engaged communities. It is well documented that third-party green building certifications provide a framework for achieving ESG and climate goals. The global alliance recognizes that not every building will achieve green building certification. However, every building can implement green building practices to benefit people and the planet and to become more resilient.

This requires investments and coordination between relevant stakeholders – financial institutions, lawmakers and building owners. The alliance plays a crucial role in facilitating this coordination. It has laid out the conditions needed for the sustainable transition of low-performing building stock. This can be a challenging aspect of our mission, but one that is critical if we want to truly achieve market transformation.

In this new paper, we outline a pathway for sustainable finance that is more easily accessible to wider projects, not just those already engaged in green building activities but to the broader building stock or “the other 75%” of buildings. Engaging the wider building stock also provides an opportunity to build more resilience in the face of increasingly damaging weather events and support vulnerable communities.

Green building technologies and strategies should be accessible to everyone and essential for creating a more resilient and equitable future. This paper is a joint call to action that puts most building stock on a path toward better performance and resilience.

ABOUT OUR ORGANIZATIONS

The organizations represented in this document are the administrators of building certification systems used worldwide by the real estate industry to demonstrate best practices for world-leading outcomes in the built environment. Over the years, their standards have introduced concepts and benchmarks into the mainstream and created market demand to ensure that these are delivered. You can learn more about these organizations at the following links:

[A-HQE GBC](#)

[BRE](#)

[GBCA](#)

[SGBC](#)

[USGBC](#)



HOW TO READ THIS PAPER

This paper is organized to help you navigate how to scale and finance wide-scale transition for the built environment. It focuses on key areas like evolving taxonomies, defining decarbonization pathways, and addressing adaptation and resilience. In each section you'll find recommendations and a joint call to action on directing capital toward the broader building stock, alongside practical examples and strategies for driving progress in real estate sustainability. While this paper is written based on our experience in the markets we broadly operate in, we believe many of our recommendations and the call to action are universal.

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Overview and Introduction

This paper, a joint call to action aptly titled 'Building Transition: Financing Market Transformation,' explores how we can create the conditions to rapidly scale action across the entire sector. It aims to accelerate transformation in developed markets, with the goal that the lessons learned can then be used to help inform strategies and practices elsewhere in the world.

The mass market is a broad term meaning that we are looking beyond the top performers, the 'green' assets, to the wider building stock.

In the developed world, most of the buildings we will use in 2050 are already standing. This means hundreds of millions, if not billions, of existing buildings globally must rapidly improve their performance. Building on our first guide, Financing Transformation: A Guide to Green Building for Green Bonds and Green Loans, we look at how we can help capital be directed to the mass market to help them transition. While much of what is written in this follow-up paper has been documented in various publications, we see the value in bringing this together in one place for easy reference, in an accessible format for key stakeholders to use as a tool for engagement.

The paper focuses on the three most critical areas for the mass market, and these are:

- **The need for better taxonomies:** Sustainable finance has a skew to green or high-performance projects. Here, we look at how taxonomies can evolve to drive inclusive action, directing capital to ensure opportunities for an inclusive transition rather than creating a secondary market for an increasingly sizable portfolio of stranded assets. Our view is through taxonomies that recognize the importance of robust transition actions, which would help simplify and streamline the structuring of impactful instruments focusing on improvements over time, enabling a shifting brown asset to become increasingly green. At the same time, we also draw lessons for how the actors in the built environment can better communicate and report their performance, as well as lessons for rating tools.
- **Defining a credible decarbonization transition:** In plain language, we put forward the necessary building blocks of building decarbonization that stakeholders can use to chart action-based pathways to reach decarbonization targets over appropriate timelines, enabling financiers to have meaningful discussions with their clients, allowing for the direction of capital to the initiatives that will have the most lasting impact in the need to decarbonize our global building stock.
- **Adapting to a changing climate:** Amid the other dynamic factors at play in this transition is the compounding risk of the changing climate. This increasingly material risk factor will increasingly leave the mass market at higher risk of being negatively impacted by climate change and becoming stranded assets without addressing resiliency.

We are aware we have omitted other material topics in this follow-up paper, including key areas such as circularity, health and well-being, as well as nature and biodiversity. These omissions, while glaring, are intentional, allowing us to first focus our discourse on setting the conditions for an inclusive and rapid transition.



Investing in the Mass Market

RATING TOOLS AND MARKET TRANSFORMATION

Green building rating tools are, in essence, a market transformation framework based on a theory of change (defining the desired outcome and creating the conditions for this to materialize). Over the last three decades, various green building rating tools have emerged, providing contextualized, consensus-based definitions and criteria defining “good, better, and best” practice and performance with mechanisms to provide transparency and accountability. These are backed by processes that provide review and/or assurance of execution and recognize success (i.e., through certification). Green building rating systems are global in scope and impact. Millions of square meters have been designed, built, and operated to leadership standards.

Furthermore, while rating tools typically focus on the higher performers, they drive change at scale by creating a self-reinforcing cycle that incrementally raises the bar on prevailing market practice and positively influences building regulations and policies. They also ripen markets for deeper market penetration through building skills and knowledge, raising awareness of what is possible, and creating demand for technologies to help them reach economies of scale. This lays the groundwork for introducing and enhancing building codes and other policy instruments that have helped move entire markets to better performance. This is illustrated by data from the US Environmental Protection Agency ENERGY STAR program.

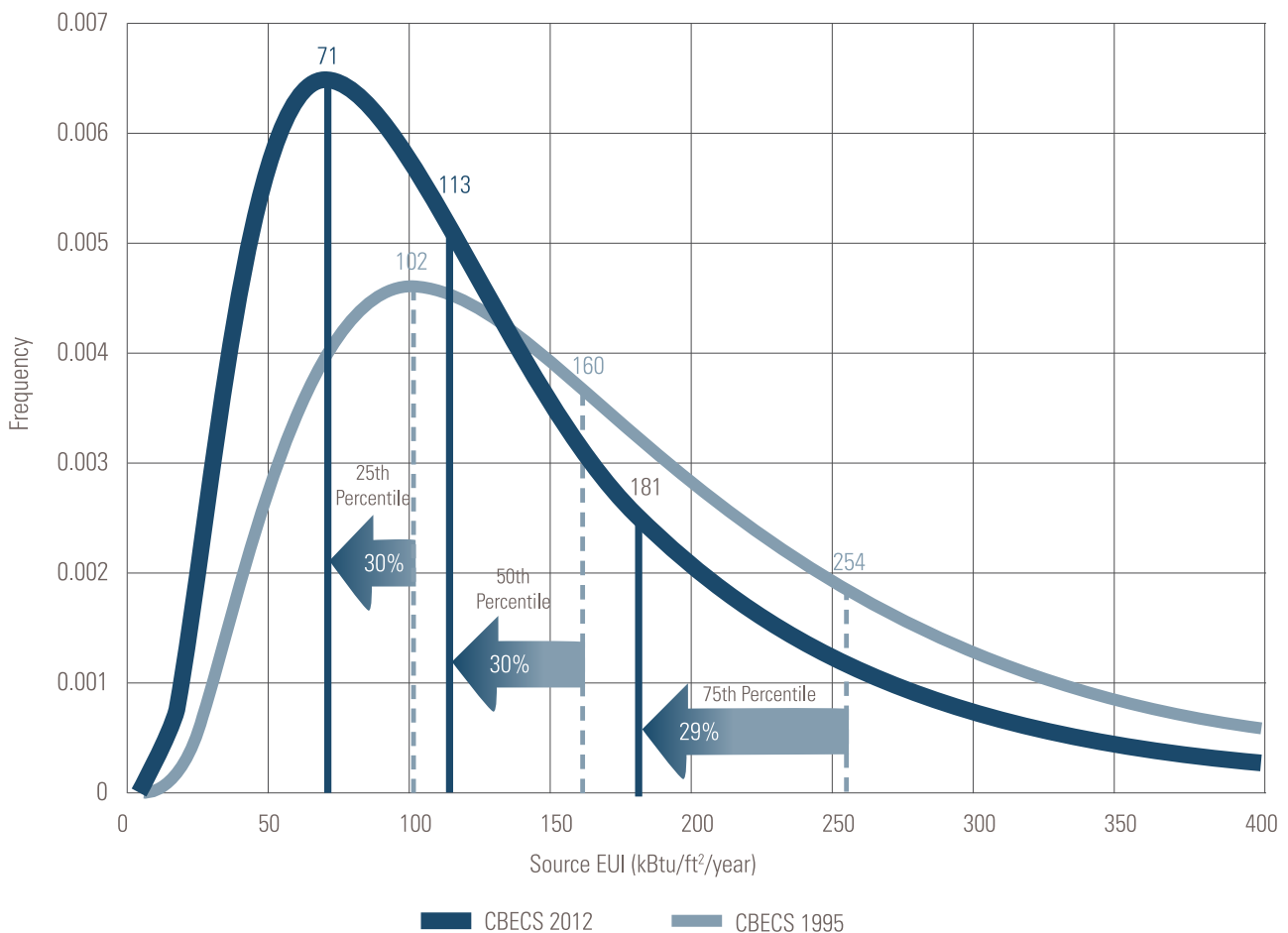


Figure 1. Distribution of source energy use intensity in US office buildings. Source: Two Decades of ENERGY STAR: A Retrospective Study of EPA’s ENERGY STAR Office Buildings Score and Certification. (2022) US Environmental Protection Agency

However, the reality remains that, in most developed markets, the lens in which we write this paper, the market transformation from rating tools is heavily skewed to the more sophisticated real estate players and assets. A substantial portion of the built environment is not responsive to or does not have the capacity, capability or capital to participate in this race to the top.

WHY IT MATTERS

Impact is not evenly distributed across regions, countries, and market segments. For example, premium office properties have broadly adopted green building practices, while the volume of Grade C properties is far less engaged. Consequently, financial instruments based on prevailing green building frameworks are likely to direct capital and thus impact, to a certain subset of the built environment, leaving others behind. The net result is a relative abundance of high-performance green offices in central business districts and a relative under-supply of high-performance elsewhere. The same is true for housing, with well-designed, high-performance bespoke housing in key locations. Most mass-market residential developments serving lower and middle-income populations are underserved and forced to make do with properties that are expensive to heat and cool and are at a higher risk of stranding as our climate changes.

Within market segments, evidence suggests as the market and financiers favor high-performance properties, the gap widens, and the laggards are left further behind. This leads to the emergence of two markets—a high-performance market engaged in green building activities and a large, disengaged market of relatively low performers.

Investing in the mass market requires designing simpler, cheaper, and tailored offerings for different business circumstances. Impact will often be measured through change over time (e.g., before and after) rather than immediately switching to being 'green.' This will require stakeholders to back away from popular concepts such as defining success as a relative "Top 15%" of the market or requiring expensive services like third-party assurance and second-party opinions. These are important concepts for financing the top of the market, but they are likely incompatible with circumstances of the long tail of poorer performers. In other words, current green financing instruments requiring these mechanisms do not adequately serve the wider transition of the built environment.

CLIMATE RISK AS A DRIVER

Traditionally, the focus on high performance by leading real estate companies, investors and financial institutions has been oriented toward delivering higher financial returns and driving asset value by distinguishing their assets in a competitive landscape. This has been remarkably successful, infusing billions of dollars of capital investment and significantly improving building performance.

However, climate and transition risk are not about exclusivity or market leadership per se. It is about transforming the whole building stock to increase resilience and create positive impact on people and the environment. A narrow focus on investment in high-performance buildings has unnecessarily limited opportunities for impact and contributed to significant business risk (e.g., regulatory pressure).

OPPORTUNITIES

At just, equitable transition to a low-carbon built environment will require billions of dollars of investment. Critically, this must be deployed by broader-reaching, more inclusive strategies than those focused narrowly on high performers. Transitioning the lower-performing assets—the wider market—to higher performing is the biggest market opportunity that climate change presents to real estate. Targeted investment in currently low-performing assets offers the best opportunities to reduce greenhouse gas emissions while benefiting vulnerable populations. Opportunities through these so-called brown-to-green strategies are more profound than prevailing green-to-green strategies, nudging already very good performance toward excellence.

We need to relook at the levers that can unlock capital to facilitate the broader transition to the harder-to-reach market segments, which can be less experienced and resource-constrained, the same reasons why they have been left behind. These are often not risk-taking or experimental segments. They are not interested in being at the "top of the market" or particularly interested in conceptual ideas like "1.5-degree alignment". They want to improve tangible, real-world performance and outcomes. They need to overcome capital and technical limitations. For example, public sector investments in credit enhancement or derisking, are linked to integrated offerings of finance and technical assistance. This contrasts with the already green segment often dominated by relatively expensive technical consultants and relatively easy access to low-cost capital.

RECOMMENDATIONS

The bottom-line recommendations for market participants are clear: We need a new generation of investment strategy targeting the wider market not yet engaged with the mainstream green building movement, barring a few nascent and pilot efforts. Transforming this vital market requires an intentional, inclusive effort to create new value propositions using faster, more scalable deployment strategies. These solutions will be different from our prevailing practices, and they will engage new communities and underrepresented property types. This will provide bold investors with new opportunities for financial returns tied to unprecedented positive impact on people and the environment.

The Need for Better Taxonomies

Sustainable Finance Taxonomies define eligible green (and, in some cases, transition) activities for financial instruments to be directed towards. Taxonomies must embrace their role in facilitating the direction of capital to transform the built environment at scale in a manner that collaborates with the wider built environment ecosystem and the existing context of buildings and building rating systems.

WHY GETTING IT RIGHT MATTERS

The scale and rate of change required for the built environment to successfully transition should not be underestimated. We will not reach that objective by directing capital to purely 'green assets.'

The International Energy Agency emphasizes the urgent need for the built environment to reduce energy consumption and eliminate fossil fuels from hundreds of millions of buildings. To get on track with the net zero energy scenario, emissions must fall by 9% per year on average until 2030, more than halving by the end of the decade¹.

This is where sustainable finance taxonomies fall short. While taxonomies claim to be science-based and include criteria targeting energy efficiency, many rarely address this holistically; for instance, to include electrification. Moreover, they tend to recognize assets as green only if they achieve exceptionally high performance, without considering the entire system, including the grids in which the buildings are connected. If we are to successfully transition the built environment, we need to drive an inclusive transition of the wider mass market that is currently underserved and work on how to direct capital that addresses the sector's transition as a whole, not just the 'green.'

CHALLENGES AND CHARACTERISTICS OF THE BUILT ENVIRONMENT

Buildings are bespoke and disaggregated. Each building's performance is directly influenced by its specific characteristics, including its occupants and intensity of use. This is unlike other sectors, where there is greater homogeneity, and representative units can represent large populations of products or systems.

Ownership is highly disaggregated. In contrast to other sectors, even the largest asset owner worldwide would not hold even half a percent of the market (with a total size of almost \$380 trillion², an investable size of \$36 trillion³, and the largest owner holding at most 0.2%⁴ of the sector). This is compounded by the long lifespan of buildings, which often have multiple owners over their lifetimes.

The good news is that these contextual challenges of the sector, coupled with the international nature of capital flows, juxtaposed with the national (or regional) scope of sustainable taxonomies and the highly local nature of buildings, are solvable.

While we focus on taxonomies, the built environment sector must also enhance how it measures, discloses, and tracks impacts and improvements over time.



Parkroyal Collection Pickering, Singapore, BCA Green Mark Platinum

1 <https://www.iea.org/energy-system/buildings>

2 Total global value of real estate estimated at \$379.7 trillion – almost four times the value of global GDP, [https://www.savills.com/insight-and-opinion/savills-news/352068/total-global-value-of-real-estate-estimated-at-\\$379.7-trillion---almost-four-times-the-value-of-global-gdp](https://www.savills.com/insight-and-opinion/savills-news/352068/total-global-value-of-real-estate-estimated-at-$379.7-trillion---almost-four-times-the-value-of-global-gdp)

3 CBRE Investment Management, the Case for listed real estate, <https://www.cbreim.com/-/media/project/cbre/bussectors/cbreim/insights/articles/the-case-for-global-listed-real-estate/the-case-for-global-listed-real-estate.pdf>

4 ANREV Fund Manager Survey, <https://www.anrev.org/en/research/fund-manager-survey/>

SPECIFIC OPPORTUNITIES FOR BETTER TAXONOMIES

AREA	CHALLENGE	RECOMMENDATIONS
<p>Diverging criteria, definitions, and methodologies</p>	<p>Different taxonomies, such as the EU Taxonomy, ASEAN Taxonomy, or national frameworks (at least 15 worldwide⁵), have varying criteria for what qualifies as sustainable. These criteria are often based solely on local legislation and context, ignoring that capital may flow across jurisdictions (e.g., EU's nearly net zero legislation). This inconsistency creates confusion among investors, developers, and other stakeholders, making applying sustainable finance raised in one region to projects in another difficult. Additionally, diverse methodologies and definitions lead to misalignment with green building practices.</p>	<p>Taxonomies should align relevant criteria and specify which standards apply domestically and which can identify assets internationally. Balancing local needs, contexts, and high performance is key, as is using adapted international standards as a baseline. Leveraging established robust rating systems can help create proxies to identify compliant assets.</p> <p>Ultimately, an alignment of metrics, measurements and methodologies (allowing for interoperability) is needed, but there also needs to be recognition of the diversity of assets and geography.</p>
<p>Overall improvement across the sector should be the focus</p>	<p>Some taxonomies lack clear guidance on transitional activities or steps for buildings that are not yet sustainable but aim to improve. This limits opportunities for the bulk of the stock that needs to transition to have targeted capital directed to them. Some taxonomies skew their focus towards new, high-performance buildings, neglecting the potential for retrofitting and refurbishing existing stock—which can often be a more sustainable option due to reduced material usage and embodied carbon. The goal of taxonomies should be to facilitate an inclusive transition rather than focusing solely on top-tier assets. This approach risks creating a "stranding" effect, where buildings that don't meet the highest standards become undervalued and neglected.</p>	<p>Taxonomies should incentivize improvement (transition) across the built environment by developing criteria that recognize incremental progress. Instead of only supporting assets that achieve a 30% energy improvement, taxonomies should also enable access to finance for those achieving smaller gains over time, like 15-20% improvements or undertaking electrification efforts that facilitate using renewable energy sources. This approach avoids creating a "stranding" effect and emphasizes the need for aggregate improvements over time, aligning with broader sustainability commitments such as national targets under the Paris Agreement.</p> <p>Using certification or labelling can help. For example, the transition of an asset from a NABERS 2 star to a NABERS 4 Star rated asset shows a positive transition. While it may not be enough to meet the 'green' criteria, it demonstrates transition.</p> <p>Taxonomies do have criteria dedicated to the flows of capital for singular energy efficient equipment. Whilst this does address some of actions that yield transition, it does not address the wider incremental progress that the sector needs.</p>
<p>Be clear on outcomes and objectives</p>	<p>Some taxonomies have criteria that are vague in their objectives and overly prescriptive in their methods without being performance-based. This lack of clarity makes it difficult for stakeholders—such as investors, developers, and policymakers—to understand the intended outcomes and implement the criteria effectively. It complicates the interpretation of each element and hinders appropriate responses, potentially leading to inefficiencies and stifled innovation.</p>	<p>Clearly define the criteria's goals. For example, outline specific areas such as energy efficiency, upfront carbon, or refrigeration for the Climate Mitigation criteria rather than using broad terms like "whole-life carbon" or "nearly net zero (energy)" This specificity will help stakeholders better understand and meet the objectives.</p>
<p>There are different levels of green (and amber)</p>	<p>Taxonomies often assume a single definition of "green," requiring full compliance with all criteria and additional safeguards. This rigid approach can inadvertently hinder sustainability efforts by discouraging investments in projects that make significant but partial contributions to environmental goals. Sustainable activities like electrification and energy efficiency improvements may not happen simultaneously, and not all actions directly impact "do-no-significant-harm" requirements. Moreover, expanding criteria across borders adds complexity and necessitates nuanced interpretation due to varying local contexts and regulations.</p>	<p>Rating tools recognize this (hence have different rating tiers that tackle holistic sustainability in a manner that is understood and implementable by the industry). Likewise, pragmatic and scalable taxonomies can implement a tiered system or spectrum of "green" and transition ("amber") levels, encouraging the direction of capital to a broader range of projects, facilitating cross-border investments, and ultimately accelerating progress.</p> <p>Such criteria can be specific and timebound to ensure robustness, and can still preserve "do-no-significant-harm" requirements.</p>
<p>Lack of alignment with well-known building practices</p>	<p>The complexity of complying with multiple taxonomies or strict criteria leads to high verification, reporting, and compliance costs. This creates confusion and forces projects seeking certification and sustainable finance to duplicate efforts. Some taxonomies disregard existing disclosure methods (like NABERS and Energy Star) and established building certifications (such as BREEAM, LEED, Green Star, Green Mark, HQE), which burdens smaller market players and may discourage them from engaging in sustainable development.</p>	<p>Collaborate with industry experts and leverage existing tools to simplify compliance and reduce costs. Utilize well-understood proxies and robust mechanisms already in place, such as recognized building certifications and disclosure methods. Develop clear guidance with input from relevant organizations and maintain an up-to-date list of suitable proxies for compliance monitoring. Engage organizations like the GRESB Foundation to create working groups that ensure effective criteria implementation and foster alignment across different taxonomies.</p>

⁵ Financing Transformation, Alliance HQE, BRE, GBCA, SGBC, USGBC, <https://gbca-web.s3.amazonaws.com/media/documents/financing-transformation-a-guide-to-green-building-for-green-bonds-and-green-loans.pdf>

The sustainable finance sector is hindered by divergent taxonomies, sometimes vague criteria, and misalignment with established building practices such as green building certification (rating tools), causing confusion and increased costs for stakeholders, directing time and capital away from action. This fragmentation restricts investment in new and existing buildings, often leading to undervaluation of assets that could achieve meaningful sustainability improvements.

To address these challenges, taxonomies should embrace context-specific, performance-oriented criteria while harmonizing approaches with a focus not just on “green” but on how to scale the transition of the sector as a whole. Engaging with industry experts and collaborating with organizations such as the national GBCs, the WorldGBC regional networks, and GRESB Foundation is crucial for developing comprehensive guidelines and implementing effective strategies that properly address the complex and multifaceted nature of the built environment. By fostering a cohesive, transparent, and adaptable approach, sustainable finance taxonomies can effectively mobilize capital towards truly sustainable projects, driving continuous improvement and advancing global environmental goals.

RECOMMENDATIONS FOR THE BUILT ENVIRONMENT SECTOR

The built environment sector and rating tools have scope for improvements. These include:

- **Relevant metrics:** Focus on key performance indicators (KPIs) that matter most to stakeholders (including investors), such as clear energy metrics like energy intensity (defining if it is whole building, primary energy demand, or equivalent), carbon intensity (upfront, operational, and the scope(s)), water usage, and waste reduction measures. Intensity metrics must be clear on the denominator, usually based on gross floor area or net lettable area. Where other metrics make sense, for example, occupancy, these should be provided in addition to supporting the organization’s decarbonization narrative.
- **Use Standardized Reporting Frameworks:** Adopt established disclosure methods like NABERS, Energy Star, or GRESB to ensure consistency and comparability of data across projects and portfolios. Unfortunately, today, even with frameworks that outline reporting standards, these are not industry-specific and prevent clear and consistent measurements, benchmarking and reporting.
- **Ensure transparency and accuracy:** Provide clear, accurate, and timely information about sustainability practices and performance. Avoid technical jargon where possible to make the information accessible to non-experts.
- **Highlight alignment with taxonomies:** Clearly demonstrate how your projects meet the criteria set out in relevant sustainable finance taxonomies. This includes detailing compliance with “do-no-significant-harm” principles and minimum social safeguards.
- **Regularly update disclosures:** Keep all disclosed information up to date to reflect ongoing improvements and to maintain credibility with investors and other stakeholders.
- **Verify performance over the lifecycle:** design, construction, operation, and refurbishment to ensure that sustainability targets are being met and the building is still meeting its sustainability targets.
- **Third-party certifications:** Obtain certifications from recognized bodies like LEED, BREEAM, Green Star, Green Mark or HQE to validate sustainability claims and provide assurance to investors over the lifecycle. Ensure certificates are valid (meaning they are relevant and reflect the asset in its current state. A rating focused on design and construction should not be used to describe a building in operation).
- **Implement continuous monitoring:** Use building management systems and other technologies to track performance metrics in real-time, allowing for proactive adjustments and maintenance.

RECOMMENDATIONS FOR RATING SYSTEMS IN THE BUILT ENVIRONMENT

Align with financial metrics: Structure rating outputs to meet the information requirements of financial institutions. This approach simplifies the assessment of sustainability credentials and reduces barriers to accessing sustainable finance. Similar to the methodology in [Financing Transformation](#), rating tools can map their alignment by overlaying which credits must be achieved to demonstrate compliance with green or transition screening criteria in existing taxonomies. This alignment provides the market with the consistency and transparency needed to scale the adoption of rating tools while identifying gaps in the tool or taxonomy.

Distinct certification levels and visibility of performance characteristics: Implement clear and tiered certification levels or scores easily understood by the finance sector. Rating tools often provide limited visibility into the actual energy performance and or efficiency improvements for each level of rating, thereby creating uncertainty about the extent of their contribution to high performance. Recognizable and clearly differentiated performance ratings, with transparent performance thresholds, facilitate quicker decision-making by investors.

Defining a Credible Decarbonization Transition

WHY IT MATTERS

For investors and owners, the decarbonization and transition of the built environment represent both a significant risk and a substantial opportunity.

As global regulations tighten and climate-related risks become more pronounced, buildings that are not aligned with sustainability standards and decarbonization frameworks will face higher operational costs, increased regulatory compliance costs, and reduced asset values. Financial Institutions around the world are simultaneously running climate stress tests and setting their own net zero targets for financed emissions. As such, assets that fail to meet increasingly stringent environmental standards may face rapid obsolescence and be deemed stranded and devalued in the market.

SPECIFIC OPPORTUNITIES FOR DECARBONIZATION

Investments in buildings on a clear decarbonization pathway are increasingly seen as attractive. It is important to recognize that decarbonization is not a binary switch that is flipped overnight. Instead, it is a multi-year, sometimes multi-decade journey that requires thoughtful technical and financial planning around building lifecycle milestones. In addition, there is a high degree of grid dependency on how an asset or entity can align with various decarbonization pathways.

We know the building blocks of thoughtful decarbonization at scale, and we need systems to guide, reward, and direct capital toward these actions at all levels. We advocate for a common but differentiated approach to transition that meets buildings where they are and provides a pathway for meaningful improvement in a contextual manner.

The following common set of strategies are the fundamental elements of decarbonizing buildings. Taken together, they provide a holistic view of how an asset or entity is poised to address decarbonization, not just today but over the coming decades.

1. **Start with energy efficiency**, which remains the foundation of reducing building carbon emissions and operational costs. This includes both passive design elements (e.g., insulation, daylighting) and mechanical (e.g., variable speed motors, high-efficiency lighting). No matter how green the grid gets, we won't be able to build enough energy supply to keep pace with unabated energy demand.
2. **Shift to electrification** through phasing out fossil fuel-based technologies in favor of electric-based equipment, including heating, hot water, and cooking applications. That means designing new buildings without combustion-based equipment and implementing plans to retrofit existing combustion equipment.
3. **Switch to renewable energy** by considering on-site where possible and then through off-site mechanisms that have clear additionality.
4. **Enable grid interactivity** through energy storage, demand response, and/or building controls that can shift building loads to periods of lower carbon grid power.
5. **Address refrigeration equipment** to remove refrigerants with high climate impact and ensure equipment allows for leak detection and safe disposal of refrigerants at end of life.
6. **Reduce upfront carbon emissions** by selecting responsible and low-carbon materials (new buildings and refurbishments.)
7. **Create and follow decarbonization plans** that articulate a schedule of retrofits, equipment replacement plans, and electrification readiness strategies needed to achieve decarbonization, along with budgets and timelines.

Green building certification schemes can provide science-backed best practices, widespread guidance to build carbon literacy, and incentives to accelerate and verify the implementation of these fundamental decarbonization elements. And they do this while addressing the holistic attributes that balance environmental and social goals. Where green building certifications are not feasible, energy ratings such as NABERS or Energy Star will help articulate the performance of the asset and demonstrate its transition over time.

MACRO MARKET DRIVERS

- **Market demand:** The market for decarbonizing the built environment is experiencing strong growth, in large part due to a clear set of macro-scale market drivers that are creating pressure for transition. A growing demand from investors, financial institutions and tenants for green buildings is driven by increasing awareness of climate risks and a desire for healthier living environments. While this is skewed to the top performers and Class A commercial assets, there is greater attention being drawn to other sectors, including hospitality, light industrial and, in some markets, multi-family residential. For instance, research shows that the soaring demand for low-carbon office space will outstrip demand in some markets by 75% or more⁶.
- **Reporting and disclosures:** Listed and large non-listed companies, which include developers and asset owners, increasingly need to respond to a complex range of voluntary and regulatory reporting requirements. These require measuring, verifying, and disclosing a range of climate-related risks and actions. In reality, there is a lack of standardization in reporting and misalignment of reporting standards with what is most materially important to truly understand building performance and its ability to adapt to climate risks over time. There is a need for a common approach to building decarbonization assessment comprised of the fundamental elements highlighted earlier that also recognize the differentiated nuances of sector, geographical, and asset class in how they approach those elements. Even with mandatory sustainability reporting in several jurisdictions being in place today, the range of information captured, how it is presented, and the consistency of information within the built environment varies so greatly that very few comparisons or conclusions can be drawn.
- **Regulatory pressures:** Governments worldwide are enacting stricter regulations to combat climate change that directly impacts the built environment. These include Singapore's Mandatory Energy Improvement Regulations⁷, targeting the poor-performing commercial buildings, with requirements for energy audits, and mandatory timebound energy improvement measures to be enacted to reduce the EUI by a minimum of 10%. The UK Minimum Energy Efficiency Standards have a mooted 2030 target for requiring a minimum of an EPC of B in order to rent a commercial property. New York's Local Law 97 will cap annual CO₂ emissions from large buildings starting in 2024, with the cap decreasing over time to reach an average of less than 1.4 kg of CO₂e per square foot by 2050. More than 12 cities and states in The United States have passed similar standards for existing buildings. In Australia, a NABERS Energy rating is compulsory whenever an office building's NLA is larger than 1,000 square meters and is being sold or leased. In France, rent increases for properties classified as F and G are no longer permitted and homes must have an energy consumption of less than 450 kWhEF/m²/year to be deemed "decent" and eligible for rental, with additional requirements in future years.
- **Technological advancements and economies of scale:** Innovations in low embodied carbon and responsible materials, electrification equipment, grid-interactivity, and low-emission construction techniques are making it more feasible and cost-effective to build and retrofit properties with a focus on decarbonization.



500 Bourke St, Melbourne, Australia. ISPT Operations. 5 Star Green Star - Office As Built v2. A fully electrified repositioned 1970s asset, with lower embodied carbon, and carbon neutral in operation using 100% renewable energy.



Fully electric commercial kitchen in action. Photo by: Global Cooksafe Coalition.

⁶ <https://www.us.jll.com/en/trends-and-insights/research/soaring-demand-for-low-carbon-offices-will-outstrip-supply#:~:text=Research%20from%20JLL%20shows%20that,in%20the%20next%20few%20years>

⁷ <https://www1.bca.gov.sg/about-us/news-and-publications/media-releases/2024/09/10/changes-to-the-building-control-act-to-enhance-energy-efficiency-measures-in-existing-buildings-for-a-sustainable-future>



Despite this positive trend, challenges remain, including higher upfront costs associated with delivering climate-ready buildings, forced retrofits of financially stretched assets in markets with declining asset values, and the issues outlined earlier when we look at the disengagement of some asset classes and owners. There is also a clear need for standardized metrics to assess and compare the contextualized sustainability of buildings across regions, which established green building rating tools can offer. **The proliferation of sustainable finance taxonomies globally does not use established rating tools as proxies. Instead, these taxonomies have developed a diverse set of often complex mechanisms to define green buildings, which has had the unfortunate outcome of introducing confusion instead of helping direct capital to transition activities.**

RECOMMENDATIONS

FOR FINANCIAL ORGANIZATIONS:

- Look for the fundamental elements of decarbonized buildings outlined earlier when assessing the climate risks and opportunities of assets. These offer a more comprehensive picture of an asset transition pathway than any one or two data points at a fixed moment in time.
- In addition to green financing products, **focus on transition financing that supports the wider holistic transition of the built environment**—including developing products that offer as-a-service models for building retrofits, allowing zero capital cost models with shared savings, and allowing inclusive opportunities for a wider demographic of buildings to retrofit.
- **Incorporate independently verified building rating tools** into investment and lending decisions to better manage climate-related risks and to better identify and capitalize on appropriate green investment opportunities. Include lower levels of rating to capture transition opportunities and improvements over time.
- Collaborate with industry stakeholders to better understand existing recognized building rating schemes to standardize metrics and reporting for sustainability performance.

FOR REAL ESTATE OWNERS:

- Prioritize electrification, energy efficiency, and responsible products in both new developments and existing properties to enhance value and reduce operational costs.
- **Create decarbonization plans that chart a course to zero or low carbon over time** that take into account technical, financial, and building lifecycle milestones considerations.
- Pursue green building certifications to demonstrate commitment to sustainability and **hold design and operation teams accountable for results**.
- Stay informed about regulatory changes and emerging technologies to remain competitive in a rapidly evolving market.

FOR POLICYMAKERS:

- **Implement and enforce regulations** that promote the removal of fossil fuels, improved energy efficiency and sustainability in the built environment, including a mix of incentives for green building practices and timebound requirements that would impact the ability to sell or rent poor-performing assets, which would drive the scale of action needed.
- **Offer default risk share schemes for financial institutions** to extend debt mechanisms to a wider pool of asset owners for retrofits to encourage an inclusive transition.
- Support research and development in green technologies and materials to reduce costs and improve accessibility.
- Facilitate collaboration between public and private sectors to drive large-scale decarbonization initiatives.

Adapting to a Changing Climate

WHY IT MATTERS

The **financial impacts of both acute and chronic climate events are growing** as damages from these events rise due to increasing severity and frequency. The World Bank estimates direct damage to power and transport infrastructure from natural hazards to be approximately \$18 billion annually in low- and middle-income countries. In 2023, the U.S. experienced 28 weather and climate disasters, each resulting in over \$1 billion in property damage, a figure that is likely to increase in the coming years⁸. In Australia approximately 520,940 homes are predicted to be uninsurable by 2030, primarily due to increasing flood risk⁹.

Furthermore, **financial losses due to disrupted business functions may outweigh any costs associated with structural damage**. For example, after Hurricane Sandy in the US, insurance payments for lost business were generally more significant than reconstruction expenses¹⁰. The Australian bushfires in 2019 caused over A\$78–88 billion in property damage and economic losses, impacting 80% of the population¹¹. Additionally, infrastructure disruptions cost households and firms at least \$390 billion each year due to natural hazards¹². To make matters worse, reconstruction is often based on the same non-resilient construction practices.

Lenders, insurers, and regulators are paying more attention to property resilience, as failure to address these risks could lead to **higher insurance premiums, difficulties obtaining loans, or even code-related regulatory hurdles**.

On the other hand, **improving resilience can provide a competitive edge**, offering benefits such as reduced damages and downtime, lower insurance costs, better insurability in high-risk areas, long-term savings in maintenance and repair, enhanced buyer and investor interest, and alignment with ESG goals. There is an in-built incentive to reward resilience assets and to leave those that aren't currently fit for purpose stranded.

Because of this, there is a risk that sustainable finance taxonomies for real estate drive finance away from those that can be impacted by these risks – not just those that are impacted by catastrophic shocks like disasters and extreme weather events, but also leaving many **properties vulnerable to rising operating costs, potential revenue losses, potentially uninsurable, and unsafe conditions** as the stresses from climate change impact the health, safety, and well-being of their occupants.

There is an additional aspect to consider when it comes to resilience. A resilient building minimizes damage during such events but also ensures quick recovery with minimal downtime and loss of functionality. An individual resilient building, while allowing for quicker recovery itself, will not recover if those who utilize it are unable to do so due to the lack of resilience in the wider neighborhood. This is why resilience is such a key topic when addressing the mass market, which is typically less resilient to both chronic (stresses) and acute (shocks) events. This is why an inclusive transition would not be complete without considering the wider issues of bringing resilience into the mass market.

8 <https://www.ncei.noaa.gov/access/billions/>

9 <https://interconnectedrisks.org/tipping-points/uninsurable-future>

10 <https://www.pillsburylaw.com/a/web/5210/Sandy-20Working-20Group-20Report-20403870875-3.pdf>

11 <https://arr.news/wp-content/uploads/2024/06/Town-bushfire-disaster-review-and-lessons-ODonnell-2024.pdf>

12 <https://blogs.worldbank.org/en/climatechange/invest-resilience-invest-people>

STATE OF THE MARKET

While green, social, sustainability and sustainability-linked instruments continue to grow exponentially, financial instruments specifically designed and labeled to support resilient investments are still scarce.

There are several challenges to this, from resilience assessments being still a niche area in building design to challenges in accessing much needed information about likely impacts in a location and to the recognition that many impacts need to be addressed at the planning and infrastructure scale. In the scale of the transition that is needed, no challenge is bigger than the need to drive finance at scale to address the already severely impacted assets by extreme weather events and temperature changes. The growing recognition of the need for climate resilience investments is reflected in significant initiatives from financial institutions such as the Asian Infrastructure Investment Bank (AIIB), which has issued its first climate adaptation bond, targeting resilient infrastructure, with a total issue size of USD 500 million¹³, and the European Bank for Reconstruction and Development (EBRD) that has also issued a USD 700 million climate resilience bond, the world's first dedicated climate resilience bond¹⁴.

The financing needs for climate adaptation and resilience in developing countries could reach \$387 billion annually by 2030. However, a report by the United Nations Office for Disaster Risk Reduction (UNDRR) highlights that “less than 10% of all climate finance is allocated to adaptation,” indicating a significant funding gap for resilience initiatives compared to overall climate finance needs¹⁵.

Taxonomies need to promote more consistent, transparent, and systematic approaches to defining and identifying resilience investment at both a building scale and an infrastructure level. They must also ensure that their criteria actively drive investment to improve the mass market rather than just recognizing those who are thankful ahead.

SPECIFIC OPPORTUNITIES

Investors and building owners are concerned about resilience, creating increasing demand for risk mitigation solutions. Specific opportunities that are actionable in the near term:

- **Define your resilience goals and investments:** Taxonomies are typically framed around climate adaptation by focusing on minimizing risks. For example, the EU Taxonomy directs finance toward projects that enhance climate resilience by reducing vulnerability. However, there are also opportunities to expand this approach to make assets more resilient and strengthen community resilience. For instance, finance can be used to enable shopping centers and community hubs to serve as emergency response centers during extreme weather events. Additionally, taxonomies can address adaptation-adjacent issues, such as improving grid resilience, to ensure that communities are better equipped to handle disruptions and maintain critical services.
- **Quantifying value-at-risk and the financial benefits of resilience features is essential for strategic investments.** For example, Moody's estimates that the annual average storm surge damage in Florida for 2050 is \$88,886 for buildings below code, \$46,264 for those at code, and \$9,650 for those above code¹⁶. While universal metrics for asset resilience are still in development¹⁷, tools like ASTM's forthcoming Property Resilience Assessment¹⁸ offer guidance. Investments should prioritize features based on asset type and location, and public funding can be leveraged to support these resilience measures.
- **Advocate for increasing infrastructure and precinct resilience.** While there are a number of ways to increase resilience at the asset level, the overall resilience of an asset is significantly impacted by the supporting municipal infrastructure, including power, water and transportation systems. Investors should engage and collaborate with relevant municipal authorities to improve the resilience of the supporting infrastructure.

13 <https://www.aiib.org/en/news-events/news/2023/AIIB-Issues-First-Climate-Adaptation-Bond-Targeting-Resilient-Infrastructure.html>

14 <https://www.ebrd.com/news/2019/worlds-first-dedicated-climate-resilience-bond-for-us-700m-is-issued-by-ebrd.html>

15 <https://www.undrr.org/financing-prevention/100-investable-activities>

16 <https://www.moodyscre.com/insights/cre-news/mainstreaming-resilience-in-real-estate/>

17 <https://www.mdpi.com/2075-5309/11/3/96>

18 <https://www.astm.org/workitem-wk62996>

LESSONS FROM GREEN BUILDING PRACTICE

Many green building practices inherently increase resilience. Energy efficiency and on-site renewable energy reduce vulnerability to power grid disruptions. Design features such as passive cooling, natural ventilation, and advanced insulation reduce vulnerability to extreme temperatures. Likewise, water-efficient systems reduce vulnerability during droughts or water supply disruptions. Sustainable materials are often more durable and require less maintenance, which enhances resilience by extending their lifespan and reducing resource consumption. This durability minimizes waste and lowers greenhouse gas emissions and ensures that structures can better withstand climate-related challenges, ultimately leading to cost savings and improved long-term sustainability. At a societal level, the lower emissions and resource consumption of green buildings help mitigate the environmental factors contributing to climate-related disasters.

In recognition of these co-benefits, several green rating systems already incorporate resilience criteria. For example, BREEAM, Green Mark, Green Star, HQE, and LEED all have requirements related to risk assessment and mitigation associated with natural hazards.



Photo credit: AISD Govalle Elementary School | LEED Silver
Austin, Texas | Photo © Brian Mihealsick

As part of an existing bond program, Austin Independent School District (AISD) has rebuilt 19 schools to be LEED Silver certified (or higher) and to achieve Austin Energy Green Building three-star certification. These school buildings are designed to be energy efficient, with passive cooling components (e.g., operable garage doors in classrooms and architectural shading on the building), and include shaded outdoor learning spaces. AISD also manages an urban forest of 15,000 trees over 2,200 acres of land across the city, which supports cooling through shade and evapotranspiration on campuses and allows the school district to identify tree-deficient schools for future planting.



RECOMMENDATIONS

FOR FINANCIAL ORGANIZATIONS

- **Integrate climate risk into underwriting and asset valuation:** Quantify the potential value at risk from chronic and acute climate events and incorporate these risks into property underwriting and building valuations. This will ensure that asset values accurately reflect their exposure and resilience, guiding more informed investment decisions.
- **Support clients in navigating their climate transition:** Proactively engage clients on their climate risks and transition plans, offering resilience solutions coupled with tailored financing options to mitigate these risks. This helps align financial products with long-term sustainability goals and reduces exposure to climate-related disruptions.
- **Plan for what to do for people who own stranded assets.** We all share the responsibility for assets that will genuinely be impacted by extreme weather events regularly. Flooding, hurricanes, bushfires, etc., are leveling events - but the people living there are genuinely impacted by decisions made decades ago to build there. The finance sector benefitted from these decisions and should develop programs to assist these stakeholders.

FOR REAL ESTATE OWNERS

- **Assess the financial risk** from chronic and acute events and quantify the potential value at risk.
- **Identify and implement measures to increase resilience**, which may require looking beyond the individual asset to the precinct or neighborhood where the asset(s) resides and the stakeholders who rely upon the services a building provides.
- **Communicate resilience features** to potential tenants and the broader market; increase occupant awareness and demand for resilience.

FOR POLICYMAKERS

- **Develop policies and standards to encourage private sector investment and leverage public sector funding:** This aligns directly with the need to establish clear frameworks for sustainable finance and investment, ensuring that both public and private sectors can collaborate effectively. Reference to ISO 14090:2019 and frameworks like the World Bank's Building Regulation for Resilience provide concrete pathways for implementation.
- **Help facilitate industry consensus on assessing, quantifying, and monetizing resilience:** Establishing consistent methodologies for measuring and valuing resilience is crucial for driving investment in sustainable finance. Clear, standardized metrics will help investors understand the financial benefits of resilience, making it easier to attract capital to resilient projects.
- **Ensure regulatory frameworks drive finance to risk mitigation measures in new construction and major renovations:** Offering financial incentives to incorporate resilience measures directly supports the transition by making these investments more attractive and feasible for developers and property owners, encouraging broader market adoption.
- **Update data collection requirements** for property condition and seismic risk assessments to require data on climate risk.
- **Liaise and advocate with municipal authorities** to increase infrastructure resilience concomitantly with asset-level resilience investments.



CTP's Green Bond Framework, developed in alignment with the 2018 Green Bond Principles, guides the financing of projects that enhance sustainability in operational practices and infrastructure development. The company certifies all buildings under BREEAM at 'very good' or above and has achieved a low-risk ESG rating from Sustainalytics. The framework has supported the certification of several green buildings within CTP's portfolio.

Invitation

In our first publication, “Financing Transformation,” we saw not just the potential of sustainable finance but a broader opportunity to rethink the role of all finance in driving the transformation of the built environment. This paper attempts to consolidate those insights and put forth a joint call to action.

The discussion isn't just about how to channel sustainable finance into the transition—it's about recognizing that all finance must now be viewed through the lens of sustainability. **At this point, financing a development that is not on a pathway to decarbonize or become more resilient should no longer be acceptable.** Every investment, whether labeled as “sustainable” or not, has consequences for the transition, and ignoring this reality undermines the very goals we're trying to achieve. Financing an asset that fails to align with these objectives is as much a sustainability decision as supporting a green project.

This paper invites us to engage in a broader conversation about ensuring that all finance, not just sustainable finance, is aligned with building a more resilient and decarbonized future. We hope to continue this dialogue with the investment community and, together, redefine what responsible finance looks like in the context of our shared climate and resilience goals.

So what's next? During the next few months, we will continue to work together to see how we can help this transition by exploring how to provide better information to investors on climate mitigation efforts through reporting standardization. We are also working with other green building councils through WorldGBC's Asia Pacific Network to provide better guidance on the interpretation of the ASEAN taxonomy in their countries. Finally, we are seeking support to develop better resilience indicators.

We are also looking to continue this conversation. We will look to engage with investors and policymakers to improve the current and in-development taxonomies. We don't have all the answers, but we have experience and are open and able to help.

Whilst we have focused on the markets we broadly operate in, the call to action is clear and universal. We need action on a scale that is almost unimaginable, billions of better buildings everywhere. The finance sector is key, and we are ready to help you achieve our shared goals.

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As the Chief Impact Officer at GBCA, Jorge ensures GBCA's strategic priorities, partnerships, products and services, including Green Star, accelerate the transformation of Australia's built environment – delivering healthier, more resilient, and positive places for people and nature. He is a member of Climate Bond Initiative's Low Carbon Buildings Technical Working Group, GRESB's Real Estate Standards Committee, Carbon Risk Real Estate Monitor's Global Industry Committee, and represented WorldGBC in Science Based Target Initiatives Buildings Technical Expert Group. He chaired WorldGBC's Global Commitment for Net Zero Carbon Buildings Taskforce and WorldGBC's ESG working group. He is also a Board Director at GreenFleet.



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Paul Mathew has over 25 years of experience in building energy efficiency and decarbonization. His expertise includes high-performance building technologies, financing and building valuation, energy and carbon benchmarking, and building performance standards. He is a Senior Fellow at the U.S. Green Building Council (USGBC), focused on sustainable finance and portfolio strategies. His career includes 21 years at Lawrence Berkeley National Laboratory. He has authored over 170 technical publications and received a U.S. Presidential Award for federal energy efficiency. He holds a Bachelor's degree in Architecture and received his Ph.D. in Building Performance and Diagnostics from Carnegie Mellon University.



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Sarah has been working at the intersection of sustainability, climate, and the built environment for 20 years. She previously served in numerous roles at the U.S. Department of Energy (DOE), most recently as part of leadership team established to oversee deployment of \$15 billion in new programs and awards to states and communities related to the Inflation Reduction Act and Bipartisan Infrastructure Law. She also served as senior advisor for DOE's Building Technologies Office, where she led the zero energy building efforts, district and community-scale solutions, and data infrastructure portfolios. Prior to her time at DOE, Sarah established the City of Baltimore's Office of Sustainability. Sarah received a Bachelor of Science degree in industrial and labor relations from Cornell University and both a Master of Environmental Management and a Master of Public Policy from Duke University.

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