



# VIBE

## INTRODUCTION TO SUSTAINABLE REAL ESTATE

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Verdani Institute for the Built Environment (VIBE)

Sustainable Built Environment Guidance Report Series

MAY 2023



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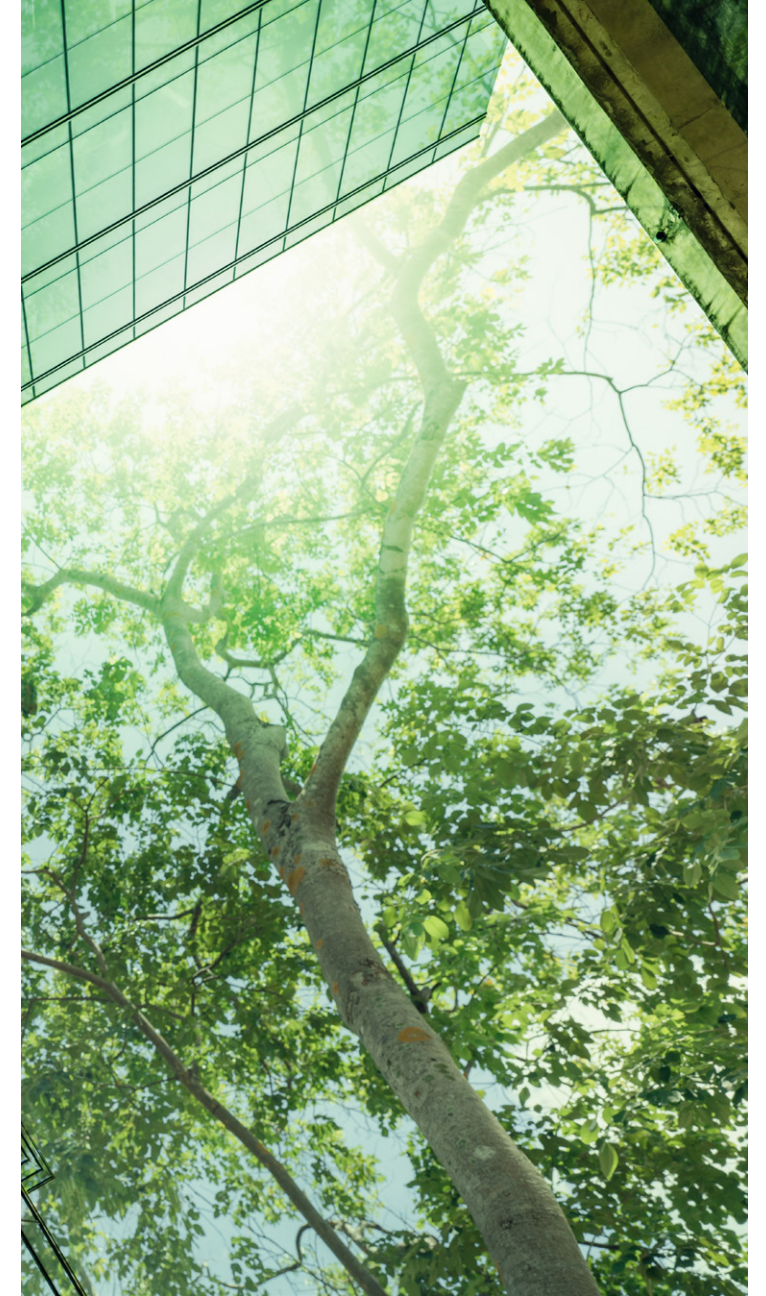


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# VIBE Sustainable Built Environment Guidance Report Series

This publication is the introductory volume in VIBE's 13-part Sustainable Built Environment Guidance Report Series. This collection of resources aims to teach critical aspects of sustainability for commercial real estate and the built environment. With a focus on addressing the climate crisis, this series will serve as a go-to resource for professionals, educators, students, and all

those inspired to take positive action through the practice of sustainable real estate. To learn more, check out our 2022 guidance report on ESG reporting frameworks. To get notified for our upcoming reports on Green Certifications and Rating Systems: Building, Professional, and Product and Corporate ESG Strategies, see links below.

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# Executive Summary

In recent years, the existential crises of climate change and biodiversity loss have pushed sustainability to the forefront of science, business, and policymaking. As the urgency grows to address these challenges, a shift in the real estate industry is simultaneously underway. Recognizing the role of buildings in driving greenhouse gas emissions and the growing risks from climate impacts, industry leaders are pushing the sector to decarbonize. The momentum to mitigate climate change, along with the COVID-19 pandemic, has also facilitated a more recent focus on biodiversity protection and social equity in the real estate sector — a trend reflected in the wider realm of corporate sustainability and environmental, social, and governance (ESG). Looking across the dimensions of climate change, biodiversity loss, and social injustice, this guidance report explores the connection between the built environment and the greatest environmental and social challenges of our time. After discussing negative impacts, we pivot to what a sustainable built environment might look like and pathways to achieve it. The business case for sustainability and trends and challenges within corporate sustainability and ESG are also discussed.



# Understanding the Climate Crisis: Challenges and Consequences

What does a sustainable world look like, and how can we achieve it? Perhaps at no other point in human history have we faced such an urgent, consequential, and complex dilemma. Since industrialization, humans have dramatically reshaped our economy and society, reaching incredible milestones along the way. Leveraging technological innovation and economic growth, we have lifted billions out of poverty, raised our standard of living, and extended our average life span. However, some of the most influential drivers responsible for this progress are simultaneously putting the future of our species in jeopardy. Without decoupling our economy from the burning of fossil fuels and rapid biodiversity loss, we may not only undo our recent



**Pictured:** Comparative images of Uganda's Mt. Stanley in 1906 (left) and 2022 (right), showing the loss of glacial mass over 116 years. (Thymann, 2023). CC BY-SA 4.0. <sup>[30]</sup>

social progress, but could permanently render the planet incapable of providing the ecosystem services humans and other species require to survive.<sup>[1]</sup>

Since nations like England, the United States (U.S.), and Japan began burning fossil fuels during the Industrial Revolution, humans have released an immense amount of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases (GHGs) into the atmosphere, causing global warming and a cascade of interconnected climate-related impacts. According to the Intergovernmental Panel on Climate Change (IPCC)'s "Sixth Assessment Report" released in 2022, human activities have already caused the Earth's average temperature to warm by 1.2 °C above pre-industrial levels. Even at this level of warming, scientists around the world have observed a clear trend of accelerating impacts: warming oceans, melting ice sheets and glaciers, sea level rise, extreme weather, and ocean acidification.<sup>[2]</sup>

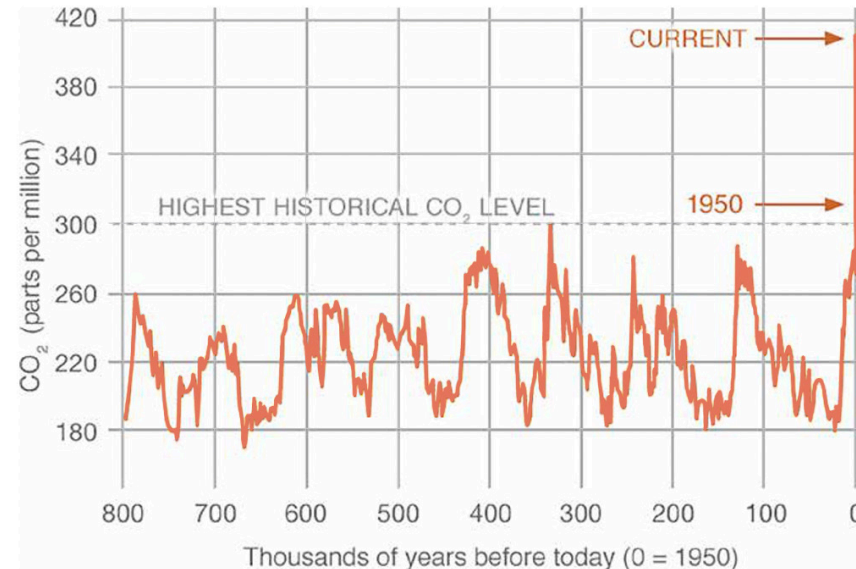






Already, rapid shifts in global weather and temperature patterns have significantly altered marine and terrestrial species' habitat ranges, food webs, and migration patterns, resulting in reduced habitat and food availability, disruptions to breeding, increased vulnerability to disease, and even extinction for species too sensitive to adapt.<sup>[4]</sup> If we continue along our current trajectory toward 2.8 °C of warming by 2100, up to 29% of terrestrial species assessed for climate impacts “will likely face very high risk of extinction,” according to the IPCC — some of these iconic species include the polar bear, monarch butterfly, koala, and Asian elephant.<sup>[5][6][7]</sup>

Figure 1. CO<sub>2</sub> levels from ancient history to today<sup>[3b]</sup>



People are similarly projected to experience more negative consequences as climate change accelerates and the world population rises. Of the eight billion people currently on Earth, approximately 3.3–3.6 billion are highly vulnerable to climate change, particularly poor and indigenous communities characterized by high climate hazard exposure, low adaptation capacity, and close dependence on local ecosystems.<sup>[6][8]</sup>

The Centers for Disease Control and Prevention report that major deleterious health issues can stem from air pollution, vector-borne diseases, waterborne diseases, reduced crop and fishery yields, and extreme weather events (e.g., floods, heatwaves, and wildfires), all of which are caused or exacerbated by climate change.<sup>[9]</sup> If left unmitigated, climate change will likely render many locations unlivable. In the World Bank’s 2021 “Groundswell Report,” researchers estimated that by 2050, failed climate action could cause untenable levels of water scarcity, sea level rise, and heat stress. These conditions could force 216 million people across six regions to migrate within their countries and up to 143 million people from Central and South American, South Asia, and sub-Saharan Africa to be displaced from their countries entirely.<sup>[10][2]</sup>

By extension, climate-related impacts to the environment and humans will inevitably impact the global economy.<sup>[11][12]</sup> Across economic, environmental, geopolitical, societal, and technological risk categories, the World Economic Forum reported in 2023 that the most severe global risks over the next decade are climate action failure, natural disasters and extreme weather, and biodiversity loss and ecosystem collapse (see Figure 2).<sup>[13]</sup>





In the U.S., we are already experiencing accelerating costs from more frequent and intense extreme weather events: over a third of all U.S. natural disaster costs across the past four decades were incurred between 2017–2021, amounting to \$803.7 billion dollars of damage in those five years alone.<sup>[14]</sup> A 2021 study from the Swiss Re Institute estimated that based on our likely mid-century temperature rise trajectory of 2.0–2.6 °C, climate change could reduce the world’s total economic value by approximately 10% by 2050.<sup>[15]</sup>

After decades of scientists sounding the alarm, world leaders finally gathered in 2015 to sign the Paris Climate Agreement, an international treaty codifying a collective commitment to limit global warming to only 1.5–2.0 °C, a level that would prevent most catastrophic and irreversible impacts. The Agreement calls for all parties to develop emission reduction plans, also known as Nationally Determined Contributions (NDCs), which are to be updated every five years.<sup>[16]</sup> To realistically meet the 1.5 °C target, in 2018, the IPCC asserted that the world must act quickly to cut GHG

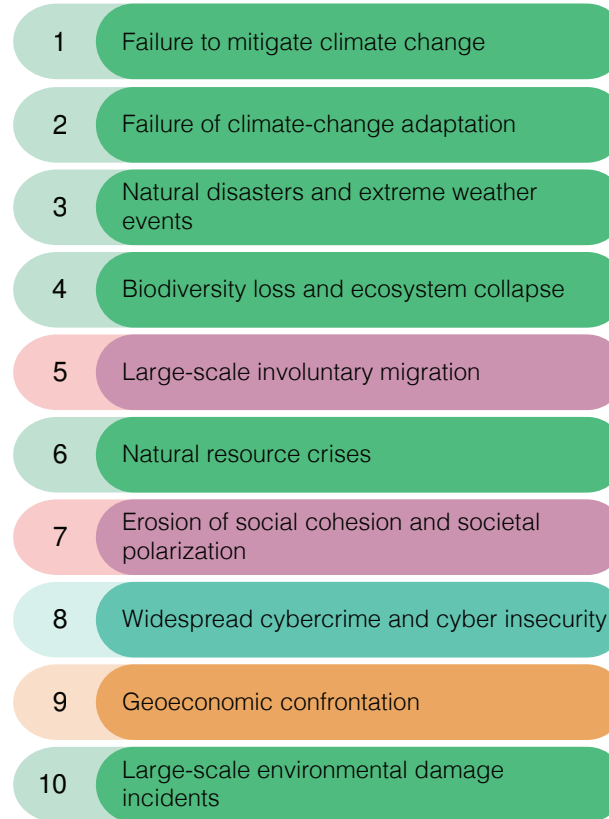


Figure 2. Global risks ranked by severity<sup>[17]</sup>

## 2 years



## 10 years



## Legend



emissions by 45% by 2030 (from 2010 levels) and reach net zero emissions by 2050.<sup>[18]</sup> Net zero is a concept broadly defined as a state in which the amount of GHG emissions generated by an entity are balanced by an equivalent amount of GHG emissions permanently removed from the atmosphere, resulting in a “net” emissions level of zero. Yet, the “2022 NDC Synthesis Report” indicates we are not transforming our economy quickly enough; instead of cutting emissions in half (compared to 2010 levels), current NDCs set emissions on a trajectory to be 10.6% higher than 2010 levels by 2030.<sup>[19]</sup> Correspondingly, a 2022 report from the World Meteorological Association estimated a 50% probability the world will exceed 1.5 °C between 2022 and 2026.<sup>[20]</sup>

To stay on track toward the 2030 target, the [buildings] industry would need to maintain the annual level of emissions reductions achieved during 2020 [during the COVID-19 pandemic], amounting to an approximate 8.3% emissions decrease per year.

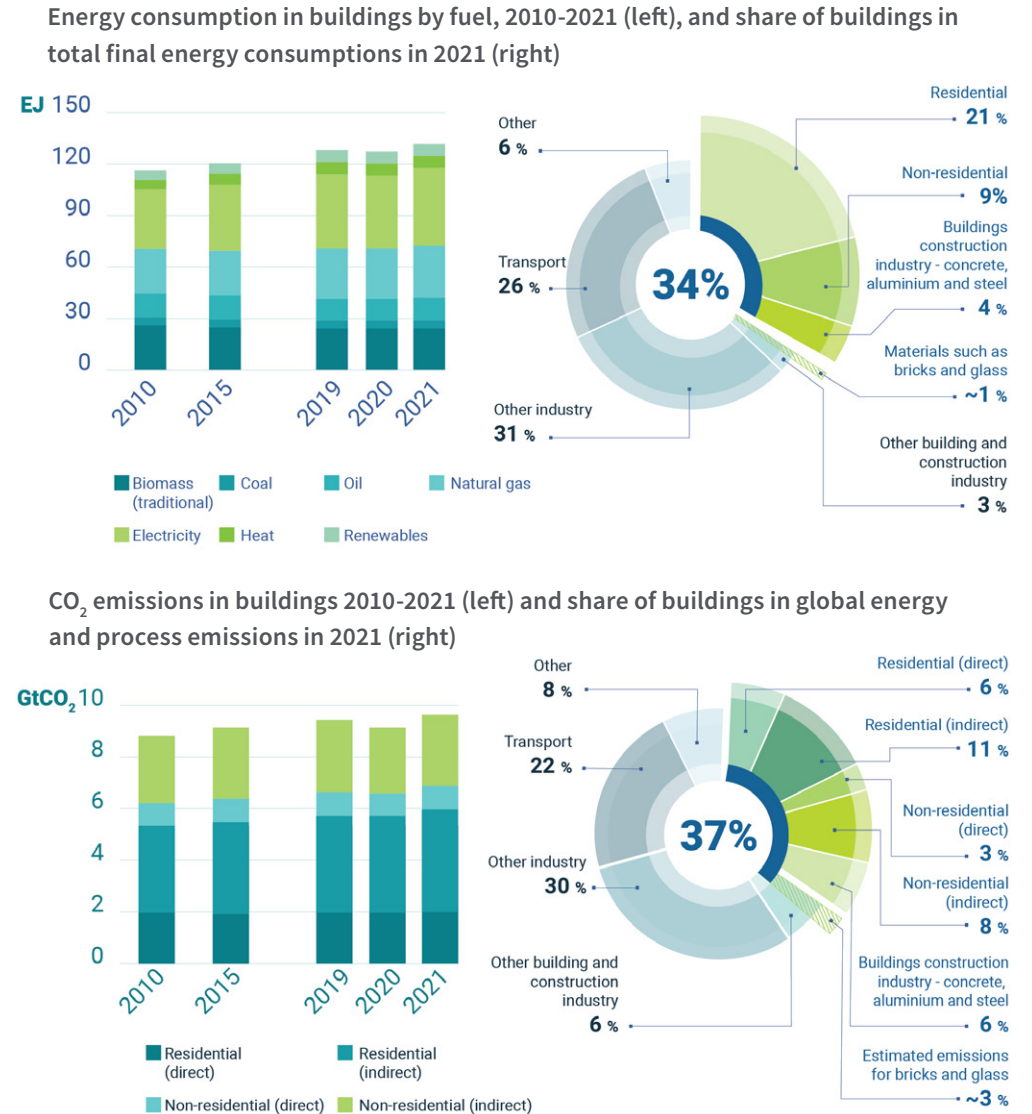
# Buildings and Sustainability: Climate, Biodiversity, and Social Impacts

## The Role of Buildings in the Climate Crisis

Among all contributing sectors, buildings and construction represent the single-biggest source of energy consumption and carbon emissions worldwide (see Figure 3). According to the 2022 United Nations (U.N.) Environment Programme Global Status Report on a zero-emissions, efficient, and resilient buildings and construction sector, the industry consumes 34% of global final energy and generates 37% of energy- and process-related CO<sub>2</sub> emissions.<sup>[21]</sup>

Throughout the life of a building, around three-quarters of its GHG emissions are generated during the operational phase, when the building is actively in use. About a third of operational building emissions are generated from fossil fuels burned on site, whereas around two-thirds come from electricity and heat sourced from energy utilities. Major sources of emissions generated during the operational phase derive from heating, cooling, ventilation, lighting, and appliances.<sup>[21][22]</sup>

Figure 3. Building energy use and CO<sub>2</sub> emissions: 2010–2021<sup>[21]</sup>







**Pictured:** Large quarry mining of iron ore. (Трубицын, n.d.)<sup>[24]</sup>

Aside from operational emissions, a quarter of building emissions — around 9% of global energy- and process-related carbon emissions — come from the buildings construction industry (i.e., concrete, steel, aluminum, bricks, and glass) (see Figure 3).<sup>[21]</sup> Building-related GHG emissions generated before and after the operational phase are known as embodied carbon. Embodied carbon includes emissions from extracting, processing, and transporting building materials, constructing and maintaining the building, and eventually, demolishing the building and managing construction waste. Cement, iron, and steel contribute to the majority of embodied carbon emissions from the built environment: in total they generate 14% of human-caused GHG emissions.<sup>[21][23]</sup>

Despite global improvements in building energy codes, energy efficiency, and the number of certified green buildings, the sector is still not decarbonizing quickly enough to stay on track to meet the IPCC’s 2030 and 2050 targets. The most recent evidence on global building decarbonization reported by the U.N. shows emissions significantly dropped in 2020. However, this was largely driven by a decrease in overall economic activity due to the COVID-19 pandemic; as the pandemic wanes, operational building emissions have rebounded past 2019 levels, with 2021 marking a 2% increase from 2019. To stay on track toward the 2030 target, the industry would need to maintain the annual level of emissions reductions achieved during 2020, amounting to an approximate 8.3% emissions decrease per year.<sup>[21]</sup>

Even if building decarbonization successfully tracks toward net zero by 2050 in regions like the U.S. and Europe, the industry will face a growing challenge concerning the immense amount of new construction



...in just the 48 years between 1970 and 2018, scientists observed a 69% drop in the Earth's monitored wildlife populations.

predicted across the next several decades. Between 2020 and 2050, total global building floor area is expected to rise by 75%, with most new construction predicted in emerging market and developing economies throughout Africa, Asia, the Middle East, and Latin America — which are currently behind advanced economies in regard to modern energy codes, clean energy infrastructure, and access to green financing.<sup>[25][26]</sup>

### The Impact of Buildings on Biodiversity Loss and Ecosystem Degradation

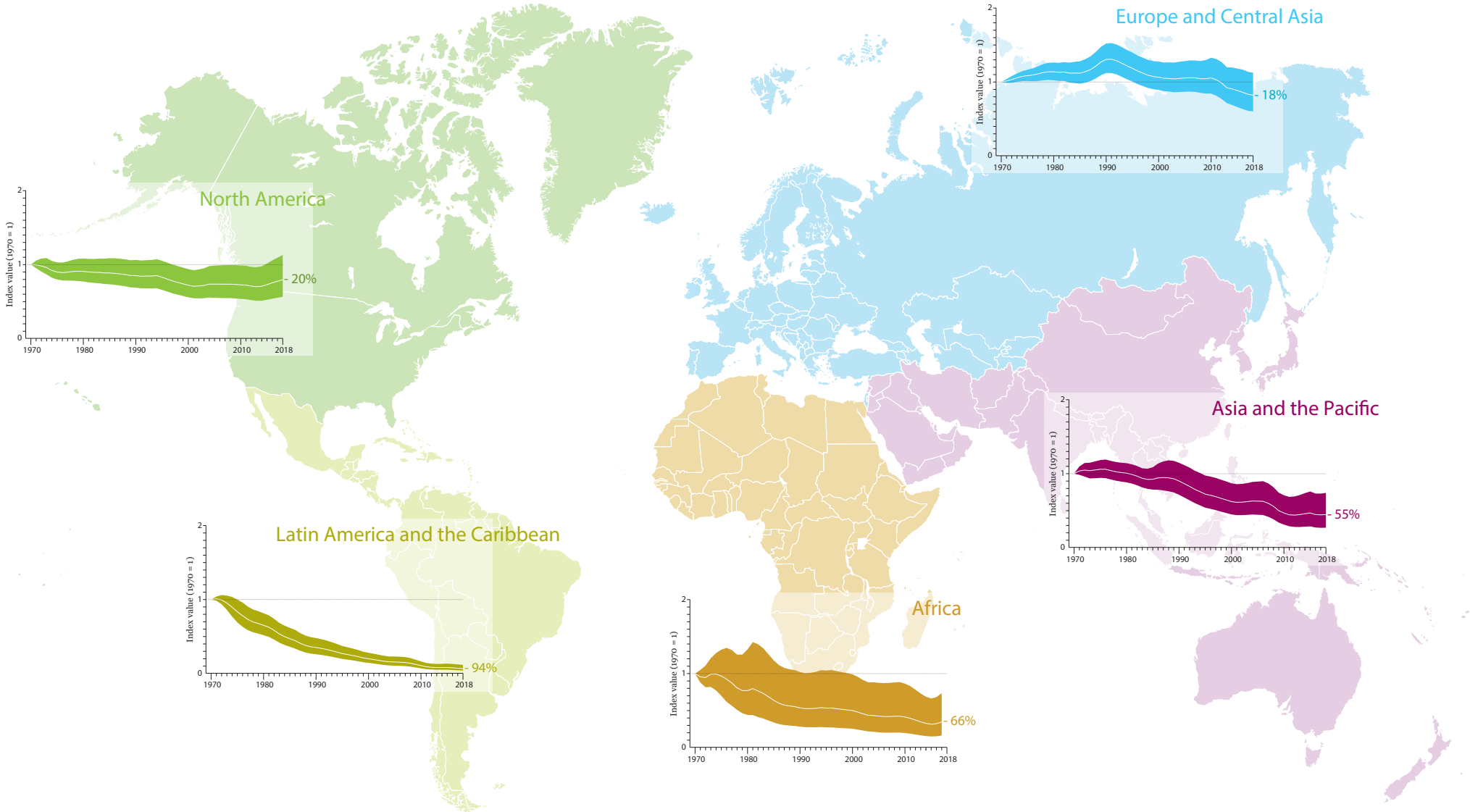
The nexus between buildings and biodiversity loss is an issue that has received relatively little attention compared to climate change yet warrants equally urgent problem solving.

Biodiversity (or biological diversity), as defined by National Geographic, “refers to the variety of living species on Earth, including plants, animals, bacteria, and fungi.”<sup>[27]</sup> Driven by economic development, population growth, and demand for natural resources, the Earth has experienced a dramatic decline in biodiversity, particularly in recent history — in just the 48 years between 1970 and 2018, scientists observed a 69% drop in the Earth's monitored wildlife populations.<sup>[28]</sup> According to the World Economic Forum, there are three socio-economic systems that impact the highest percentage of threatened or near-threatened species: food, land and ocean use (72%), infrastructure and the built environment (29%), and energy and extractives (18%).<sup>[29]</sup> With extinctions occurring at rates hundreds or thousands of times faster than normal, many scientists believe the Earth is experiencing its sixth mass extinction event, the first uniquely attributed to human activities.<sup>[1]</sup>



*Pictured: Deforestation in New Zealand in 2011. (Wegmann, 2011). CC BY-SA 3.0.<sup>[30]</sup>*

Figure 4. Living Planet Index (i.e., a measure of biological diversity) by region: 1970–2018<sup>[31a]</sup>







*Picture: Housing developments in Markham, Ontario. (IDuke/Sting, 2005). CC BY-SA 2.5<sup>[34]</sup>*

Unless we reverse this trend, conservation biologists predict humans could eventually lose access to necessary ecosystem services from which humans derive both economic and health benefits, such as fresh water, pest control, and crop pollination.<sup>[1]</sup> As noted by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, ecosystem services are “the benefits people obtain from ecosystems,” which can be “supporting, regulating, provisioning, and cultural.”<sup>[31b]</sup> Moreover, because biodiverse regions sequester and store large amounts of carbon from the atmosphere, preserving biodiversity is particularly critical in the context of climate change mitigation. By the same token, if we fail to mitigate the climate crisis, the impacts of climate change are likely to become the dominant driver of future biodiversity losses.<sup>[28]</sup>

In exploring the multifaceted connection between biodiversity loss and real estate, we must focus on urbanization, the building material life cycle, and climate change. The most visible way the built environment negatively impacts biodiversity is through urbanization — land conversion from natural to urbanized land uses — which, apart from transportation infrastructure, mostly occurs through the development of homes, offices, shopping centers, and other buildings.

As the global population expands, urbanization is projected to be a growing driver of biodiversity loss. This is especially problematic because urban land expansion is predicted to concentrate in biodiversity hotspots.<sup>[32]</sup> Throughout the process of urbanization, not only are natural species lost, but so are important ecosystem services.<sup>[33]</sup> Beyond the impact of urban land development, buildings also contribute to biodiversity loss through the building material life cycle. Many commonly used materials, like steel, concrete, and cement, are often extracted,





**Pictured:** Holy Rosary Cemetery outside the Union Carbide petrochemical factory in a largely Black, low-income area of Louisiana dubbed "Cancer Alley." The moniker comes from the high incidence of cancer in the area, which contains some of the most toxic air and water in the country.

manufactured, transported, and disposed of through processes that are both energy intensive and environmentally impactful, contributing to land degradation, habitat loss and fragmentation, and air and water pollution.<sup>[35]</sup>

The energy-intensive nature of producing building materials is similarly reflected in a building's operational phase, which is responsible for the majority of a building's total energy use and carbon emissions.<sup>[21]</sup> Given the strong connection between buildings and climate change, biodiversity loss related to climate change can, by extension, also be attributed to the buildings industry.

## Housing and Neighborhood Quality: Equity and Health Implications

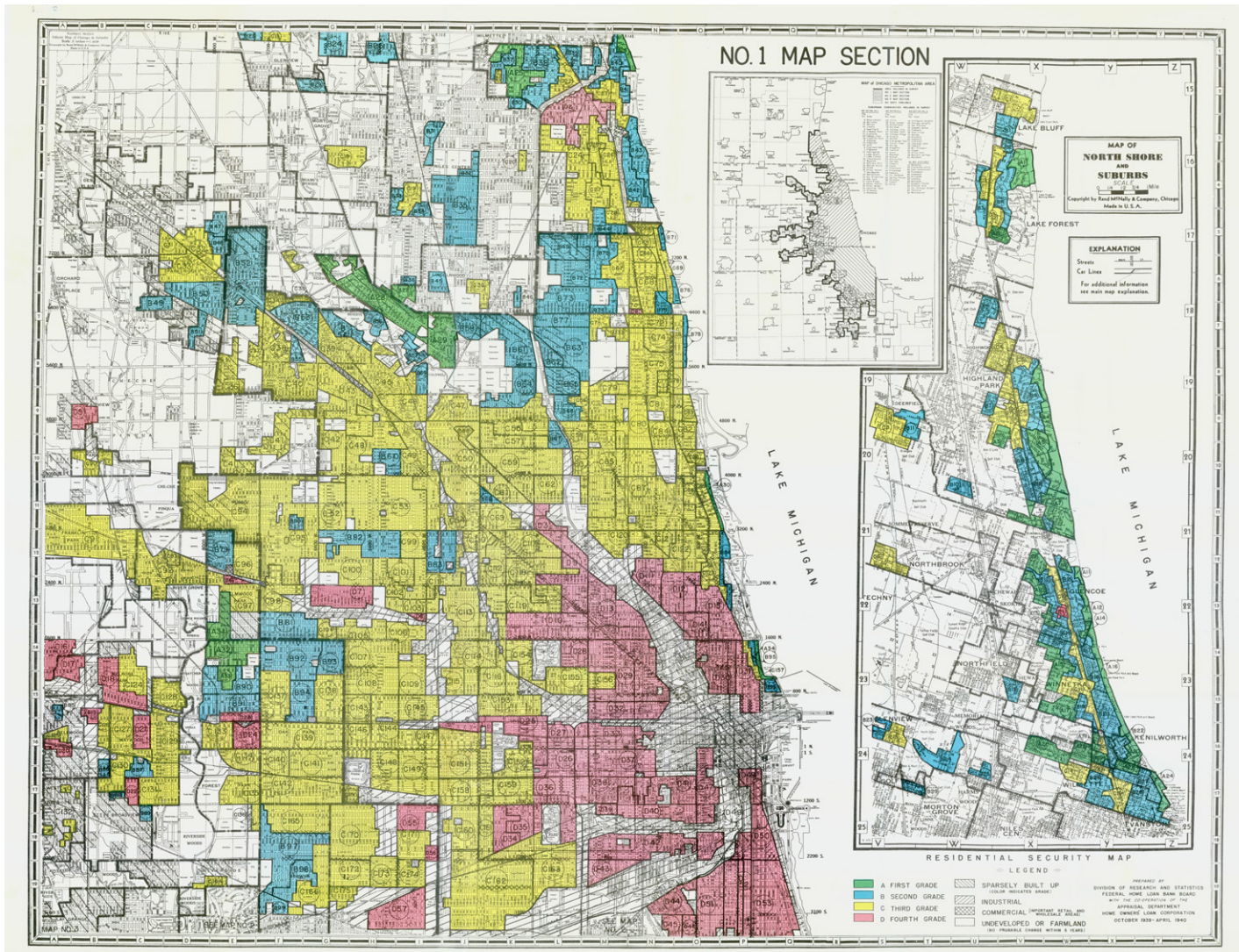
The built environment is also closely tied to the health and well-being of society.<sup>[36]</sup> According to Healthy People 2030, "neighborhood and built environment" is one of the five primary social determinants of health (SDOH) — factors that "affect a wide range of health, functioning, and quality-of-life outcomes and risks."<sup>[37]</sup> Like other SDOH, such as economic stability, the connection between housing and health can be interpreted through the lens of social equity.

In the U.S., low-income and Black, Indigenous, and people of color (BIPOC) communities are more likely to experience negative housing-related outcomes because they are more likely to occupy housing of a substandard quality (i.e., older, poorly maintained). Due to factors like poor ventilation, inadequate heating or air conditioning, indoor combustion appliances, cooking fumes, mold, dust, and lead, occupants



**Pictured:** A house in the predominantly Black city of New Orleans after Hurricane Katrina caused mass flooding, over 1,000 fatalities, and \$108 billion (unadjusted 2005 dollars) worth of damage in 2005. This house was evacuated and left for two weeks, during which time visible mold manifested due to serious leaks in the exterior. (Infrogmation, 2005). CC BY-SA 2.0.<sup>[38]</sup>





**Pictured:** A historic map created by the Home Owners Loan Corporation (HOLC), grading residential areas of Chicago from A (best, green) to D (worst, red). These maps explicitly considered variables such as race, ethnicity, religion, and other characteristics in their grading, cratering the value of BIPOC-owned properties and encouraging discrimination of marginalized groups by lenders for years to come.<sup>[49]</sup>

of substandard housing are more likely to experience asthma and other physical and mental health issues.<sup>[39]</sup> Because substandard housing is less energy efficient, occupants also face a higher energy burden, meaning their energy costs are disproportionately high.<sup>[40]</sup> Additionally, BIPOC and LGBTQ+ (lesbian, gay, bisexual, transgender, queer, and other identities) communities are also more likely to face discrimination and other barriers related to housing access, notably around home ownership.<sup>[41][42][43]</sup>

Closely connected to housing quality, the quality of one’s neighborhood also has significant implications for health and well-being. Traced back to historic redlining policies, where Black Americans were systematically denied housing mortgages and relegated to urban housing projects, BIPOC communities in the U.S. are now more likely to live in neighborhoods with limited access to quality jobs, food, transportation, and parks. Those same communities are also being disproportionately exposed to environmental and climate hazards like air pollution, floods, and heatwaves — all of which can negatively impact health and economic outcomes. <sup>[44][45][46][47][48]</sup>

Similar housing-related issues are prevalent across other wealthy nations. Mirroring the U.S., redlining also occurred in Canada between the 1930s and 1950s, and in Australia, housing-related discrimination and health inequities have been documented, particularly among Aboriginal populations.<sup>[50][51]</sup> Housing discrimination is also common in Europe, though there is less racial and ethnic segregation than in the U.S., and neighborhood is not as strong a predictor of life outcomes (i.e., health, economic). This is thought to be partially due to Europe dedicating more funding and attention toward public welfare, though there is also simply



a smaller proportion of minorities in general.<sup>[52]</sup> However, evidence also shows income inequality is increasing throughout most European countries, resulting in more urban segregation, social exclusion, and negative health impacts, particularly among immigrants and refugees.<sup>[53]</sup>

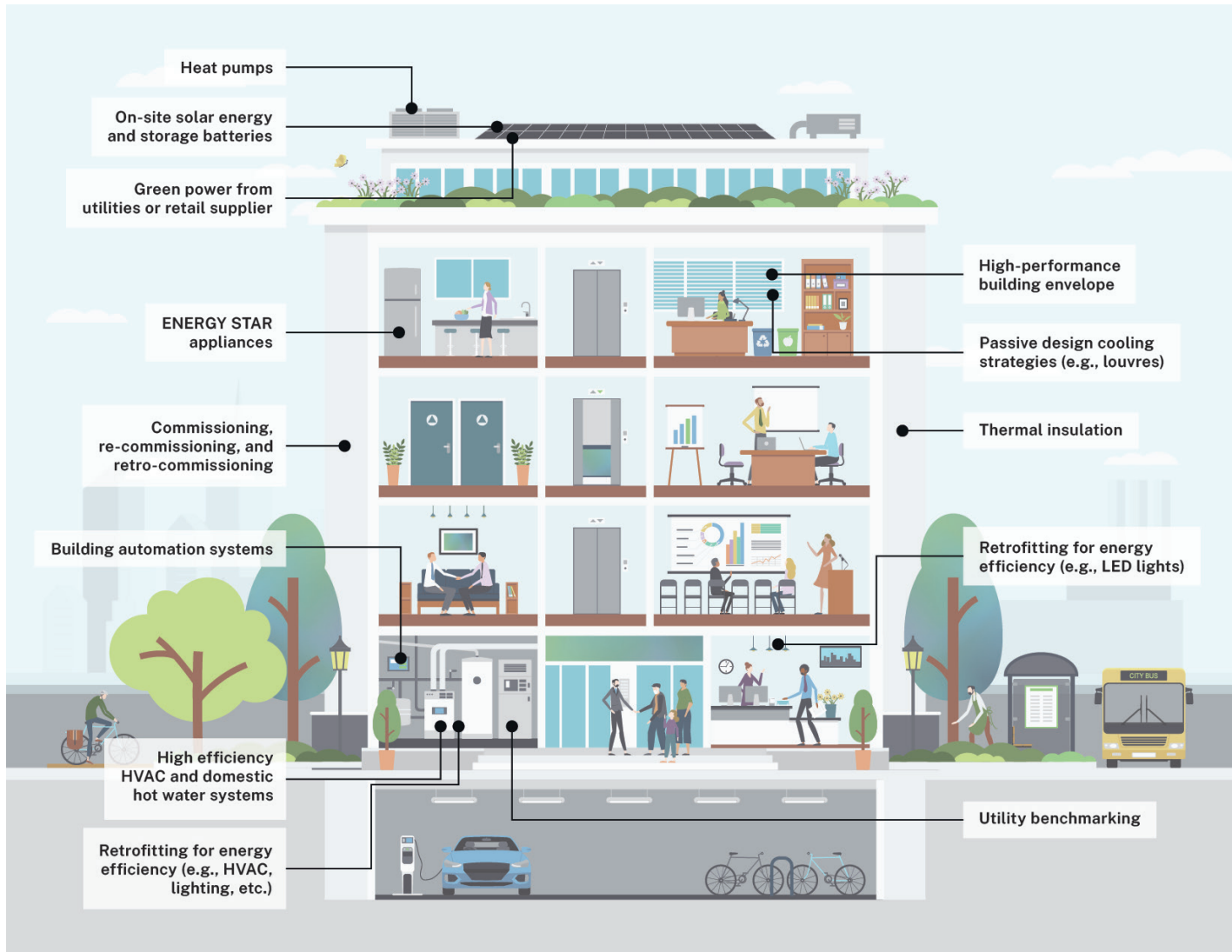
In less wealthy nations, housing-related health issues are widespread, particularly within informal settlements — dense urban development that does not comply with local building codes and lacks adequate public services (e.g., water, waste, or sanitation).<sup>[54]</sup> As reported by the U.N., informal settlements house over a billion people globally, mostly throughout sub-Saharan Africa and Asia.<sup>[55]</sup> Due to factors like poverty, overcrowding, pollution, and unsanitary conditions, residents of informal settlements face elevated health risks like asthma, depression, infectious diseases, accidental injuries, and assault.<sup>[56]</sup>

It is also important to highlight that the global population faces a cost-of-living crisis (see Figure 2), driven significantly by rising housing costs.<sup>[13]</sup> Globally, the cost of housing has grown faster than incomes in most countries, including the U.S., Canada, United Kingdom, and Japan.<sup>[58]</sup> In the U.S., average rental costs rose by 18% between 2017 and 2022, while simultaneously, real median household incomes increased by less than 5%.<sup>[59][60]</sup> In the U.S., rising costs of housing are associated with a housing shortage — as of 2020, U.S. supply of housing for sale or rent was at its lowest level in more than 30 years, a trend that disproportionately impacts low- to middle-income Americans.<sup>[61]</sup> The rising cost of housing not only makes it more difficult for families to pay for other necessities like food and transportation, but it also contributes to inflation and stifles economic growth.<sup>[62]</sup>



*Pictured: An informal settlement in the city of Chennai, India. (Huemer/Österreich, 2005). CC BY-SA 3.0.<sup>[57]</sup>*

Figure 5. Features of a decarbonized built environment



# Sustainable Real Estate: A Vision for the Future and Strategies for Success

What might the path to a sustainable built environment look like? Across the themes of climate change, biodiversity, and social equity, this section discusses opportunities for the real estate industry to shift toward sustainability and where we are already seeing progress in this direction.

## Accelerating Decarbonization and Enhancing Climate Resilience

Given the built environment's role in driving climate change, achieving the objectives of the Paris Agreement will require widespread decarbonization across the residential and commercial building sectors — and fast. The scale and speed required would be unprecedented, but decarbonizing real estate and construction by 2050 is still possible, primarily through energy efficiency, electrification, and behavioral change.<sup>[25]</sup>

According to the International Energy Agency (IEA)'s "Net Zero by 2050: A Roadmap for the Global Energy Sector" and "World Energy Outlook 2022," the buildings industry can mostly rely on existing technologies and strategies to reach net zero by 2050: improved building envelopes, electric and energy-efficient appliances (e.g., heat pumps), and "bioclimatic and material-efficient building design." Some of these sustainable building features can be viewed in Figure 5.



**By 2030, all new buildings must comply with zero-carbon-ready energy codes, characterized by high energy efficiency, renewable energy use, mitigation of scope 1–3 emissions, and passive design principles.**

Bioenergy, digitalization and smart controls, and behavioral changes (e.g., line drying) will also be important factors in reducing the industry’s emissions to zero. By 2030, all new buildings must comply with zero-carbon-ready energy codes, characterized by high energy efficiency, renewable energy use, mitigation of scope 1–3 emissions, and passive design principles. Moreover, at least 85% of the world’s existing buildings will need to be retrofitted for compliance by 2050.<sup>[25]</sup>

To make this decarbonization pathway realistic, the IEA notes that policymakers must prioritize the adoption of energy codes and performance standards, increase financial incentives for building decarbonization, and strategically phase out fossil fuels. Fortunately, political momentum is already building throughout Europe and the U.S., both of which have set net zero targets for 2050.<sup>[63][64]</sup>

In 2021, the EU commission proposed a revision to the Energy Performance of Buildings Directive that would require all new buildings to be zero-emission by 2030 and would raise the minimum energy performance standard for existing buildings.<sup>[65]</sup> At the end of 2022, the EU also reached an agreement to establish a Carbon Border Adjustment Mechanism, which is effectively an import tax on carbon-intensive goods from other countries.<sup>[66]</sup> The EU has also begun to implement its sustainable finance framework — including the EU Taxonomy, Sustainable Finance Disclosure Regulation (SFDR), and Corporate Sustainability Reporting Directive (CSRD) — policies that work together to push companies and financial institutions toward low-carbon and other sustainable economic activities.<sup>[67]</sup>

In the U.S., the landmark 2022 Inflation Reduction Act (IRA) will put \$369 billion dollars toward addressing climate change, including \$270 billion in tax incentives.<sup>[68]</sup> In addition to an array of clean energy and energy efficiency programs for residential buildings, the IRA will allow more commercial buildings to improve their energy and carbon performance at a reduced cost through expanded funding and eligibility for the 179D Energy Efficient Commercial Buildings tax deduction.<sup>[69]</sup> Additionally, in 2022, the U.S. Securities and Exchange Commission (SEC) proposed the country’s first major climate disclosure rules that would require public companies to annually disclose their GHG emissions, climate risks, and risk management plans alongside their annual financial statements.<sup>[70]</sup> Other U.S. developments worth mentioning are the Building Codes Initiative, the proposed rule to decarbonize and electrify all new and newly renovated federal buildings, and a goal of net zero emissions in all federal buildings by 2045.<sup>[71]</sup>

Beyond complying with emerging climate policies, real estate companies must set and deliver on high-integrity net zero commitments. According to 2022 recommendations from the U.N. High-level Expert Group on the Net Zero Emissions Commitments of Non-state Entities, commitments should be aligned with the Paris Agreement’s 1.5 °C target; contain short-, medium-, and long-term targets; increase ambition over time; and address all emissions scopes, including emissions from tenants and building materials.<sup>[72]</sup> Providing guidance, accountability, and collaboration opportunities, several real estate-focused initiatives have gained popularity in recent years that help companies set and work toward net zero targets, including the Better Buildings Partnership, the



*Pictured: The Thames Barrier in London, a retractable barrier system built in 1982 to protect the city from natural disasters such as flooding and storms. (Cameron, 2020)<sup>[77]</sup>*

Net Zero Asset Managers initiative, the UN-Convened Net-Zero Asset Owner Alliance, and World Green Building Council Net Zero Carbon Buildings Commitment. More information on these initiatives can be found in our guidance report, “Navigating ESG Reporting Frameworks: A Comprehensive Guide.”

While the buildings industry has many challenges to overcome to achieve net zero by 2050, momentum is building toward a low-carbon market transformation. Data from the 2018–2021 S&P Global Corporate Sustainability Assessments showed that 43% of participating real estate companies — representing \$924.5 billion in total market capitalization — had set emission reduction targets in 2021 (up from 26% in 2018), and 26% had set net zero targets.<sup>[73]</sup> Nareit’s 2021 Member Survey similarly found 59% of real estate investment trusts (REITs) had a GHG emission reduction target (up from 43% in 2020), and 27% had an operational carbon neutrality or net zero goal.<sup>[74]</sup> Beyond the real estate sector, nearly half of the asset management sector at large and 41% of the world’s top 2,000 companies have committed to net zero emissions; however, the Net Zero Tracker notes that many corporate pledges do not meet minimum target-setting standards.<sup>[75][76]</sup>

Reducing the built environment’s emissions is imperative to mitigate the worst impacts of climate change, but how should the real estate industry cope with climate impacts that are already occurring? Even if the world succeeds in achieving net zero by 2050 and limiting global temperature rise to 1.5 °C, temperatures are still expected to rise beyond our current average of 1.2 °C, resulting in more frequent and intense heatwaves, storms, droughts, floods, and other impacts.<sup>[2]</sup>





*Pictured: ACROS Fukuoka, a performance hall and conference space in Fukuoka City, Japan. (Mabuchi, 2011). CC BY-SA 2.0.<sup>[80]</sup>*

Protecting assets, building occupants, and communities from climate change will require a closer focus on adaptation and resilience — respectively defined by the IPCC as “the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities” and “[t]he capacity of interconnected social, economic and ecological systems to cope with a hazardous event, trend, or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure.”<sup>[78]</sup>

There are numerous climate adaptation and resilience strategies the built environment can leverage, all of which should be prioritized based on vulnerability to climate risks. In regions prone to flooding, for example, owners should work to incorporate green infrastructure like urban forests,

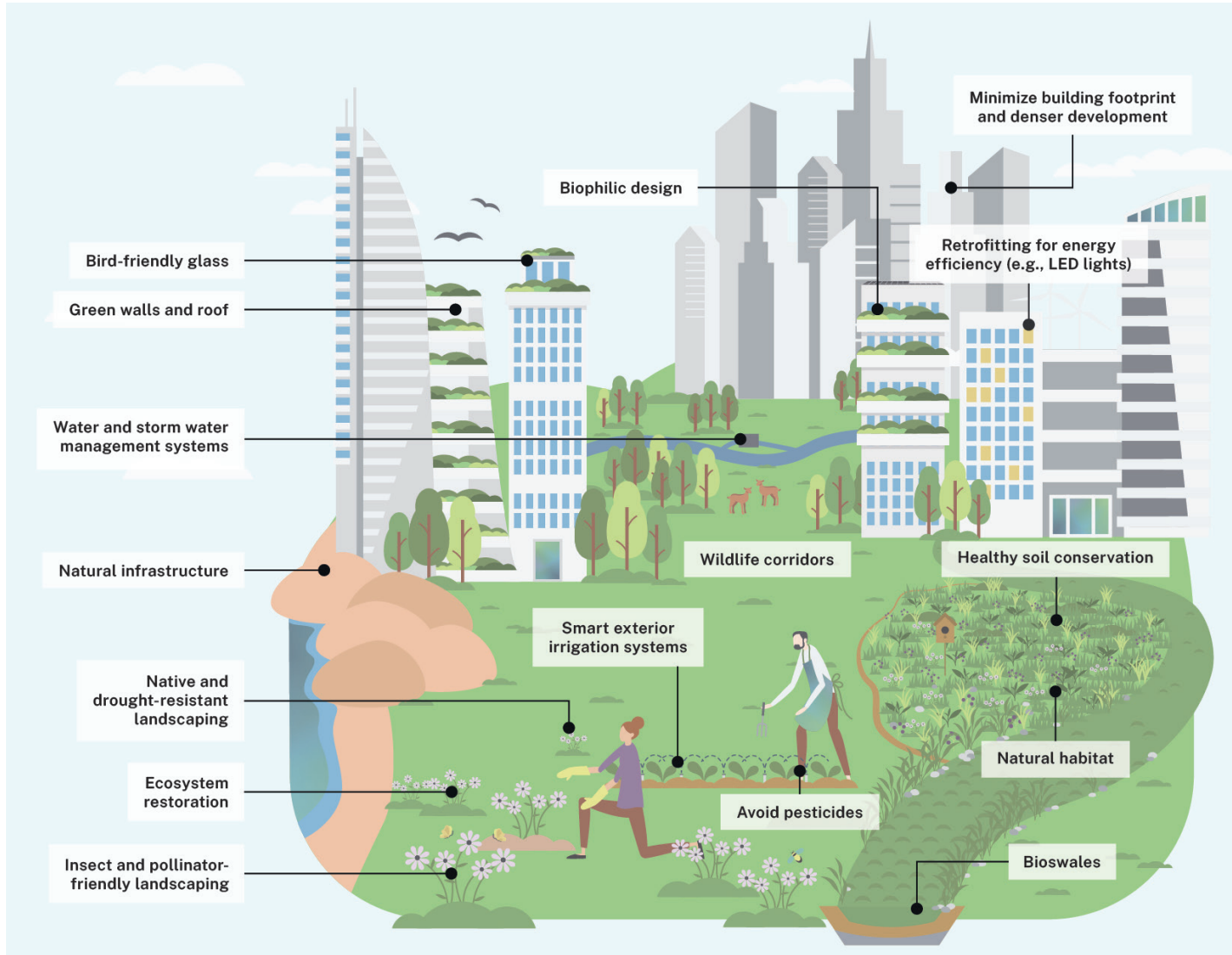
rain gardens, and permeable pavement that absorb and divert stormwater. Along coastlines vulnerable to sea level rise, adaptation could mean elevating buildings and utility infrastructure, using flood-resistant materials, and installing backup power systems. In drought-prone regions, it would be important to minimize water consumption through water-efficient toilets and faucets, greywater systems, and drought-tolerant landscaping. Regardless of region, owners should also work with stakeholders like tenants, communities, and local governments to better understand vulnerability to climate impacts and identify strategies to collectively adapt.

## Advancing Biodiversity Conservation and Nature-Based Solutions

To minimize and reverse biodiversity loss as urban populations grow, the real estate industry must work to reduce urban sprawl, minimize building footprints, and support the preservation, restoration, and connectivity of greenspace. Avoiding further negative impacts to nature is essential, especially in biodiversity hot spots, but it will also be important to engage in remediation, rehabilitation, and restoration of already degraded habitats. When assessing nature-related mitigation opportunities, companies should think beyond the scope of their building footprints and toward the biodiversity implications of the entire building life cycle, including sourcing sustainably harvested materials, restoring ecosystems across materials supply chains, supporting the rights of indigenous peoples, and reusing building materials. On site, buildings should be designed to maximize opportunities for nature to thrive through features like green walls and roofs, native and pollinator-friendly landscaping, stormwater retention ponds, bird-friendly glass, protected natural areas, and riparian buffers along streams and rivers. Fortunately, most of these strategies don’t just benefit nature — they come with social and economic co-benefits, such as improvements in human health and well-being, pollution reduction, carbon sequestration, and increased resilience to climate change impacts like hurricanes, floods, and heatwaves.<sup>[79]</sup>



Figure 6. Features of a life-supporting built environment



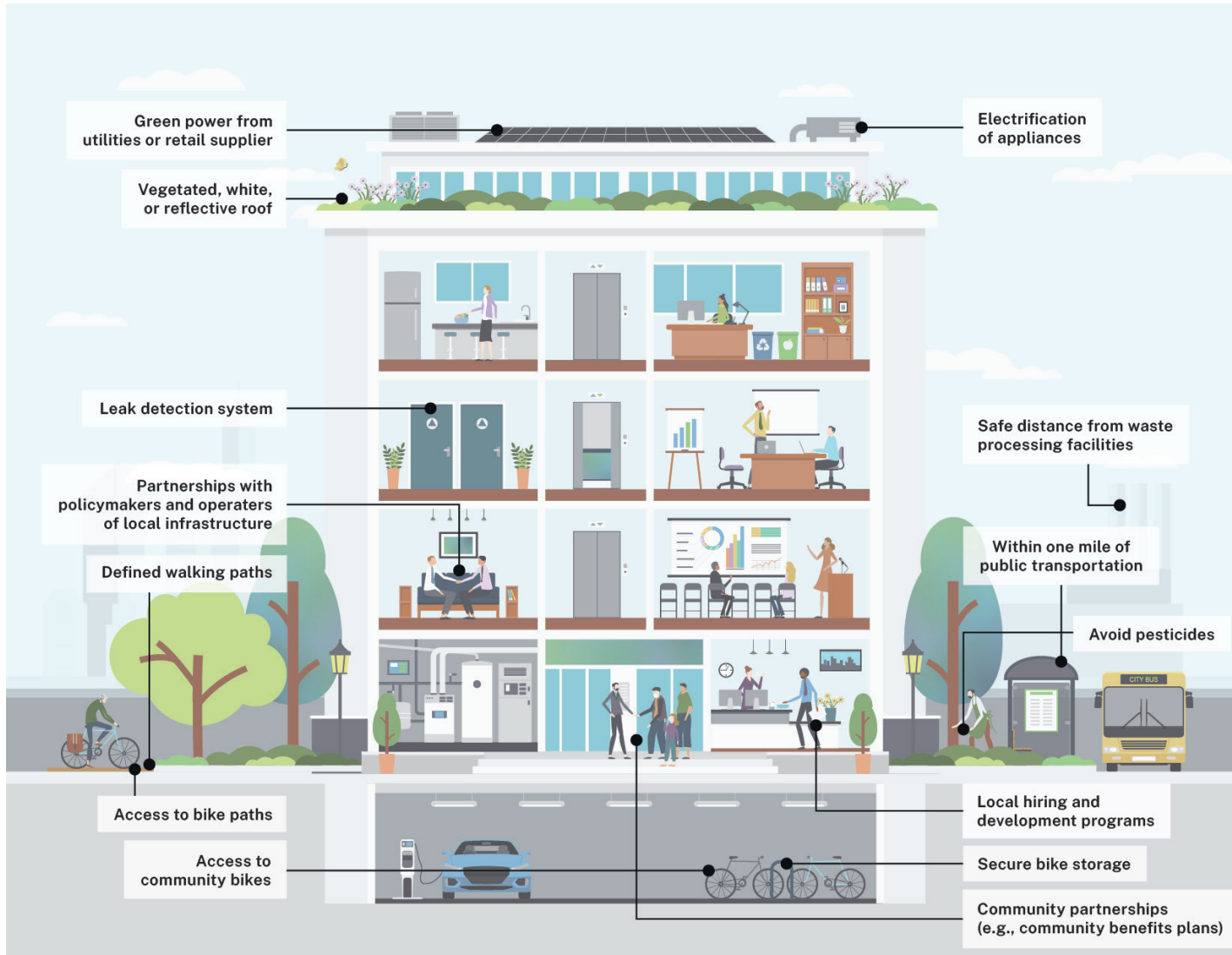
Though the biodiversity movement within the real estate industry is still in its infancy, it has quickly gained popularity in the larger corporate sustainability conversation. Recognizing the systemic risk of biodiversity loss, investors have increasingly turned their attention to biodiversity and natural capital risks, urging companies to disclose not



*Pictured: An insect hotel in Bærum, Norway. (Hodnett, 2021). CC BY-SA 4.0.[81]*

only their biodiversity risks and opportunities, but also their impacts and dependencies on nature.<sup>[82]</sup> Toward this concern, the Taskforce for Nature-related Financial Disclosures (TNFD) is set to release their final recommendations for market adoption in September 2023 that will guide organizations' reporting and management of nature-related risks and opportunities.<sup>[83]</sup> Similarly planned for 2023, the Science Based Targets Network will soon release a framework aimed at helping companies assess biodiversity impacts and set targets to avoid future impacts and restore ecosystems.<sup>[84]</sup> Other developments include updates to the Global Reporting Initiative's (GRI) biodiversity reporting standard, required biodiversity impact reporting under the EU's SFDR, and the addition of a biodiversity module in CDP's Climate Change 2022 Questionnaire.<sup>[85][86][87]</sup>

Figure 7. Features of a socially sustainable building and community



On December 19, 2022, nearly 200 countries (with the U.S. a notable exception) signed the landmark Kunming-Montreal agreement, colloquially described as the “Paris Agreement for nature.”<sup>[88]</sup> It calls for the protection of 30% of terrestrial and marine ecosystems by 2030, along with 2030 targets related to ecosystem restoration, global food waste, and finance mobilization, among other issues. Given that only 17% of terrestrial and 8% of marine ecosystems are currently under protection, the agreement represents a major step forward in collectively addressing global biodiversity loss and indigenous rights.<sup>[89]</sup>

## Transforming Real Estate for a Just and Equitable Future

Social outcomes are also critical in realizing a holistically sustainable built environment. In a theoretical sustainable future, all people would have access to housing that is not only affordable, but also supports health, well-being, and economic prosperity. Instead of being seen as luxuries, the economic, social, and environmental benefits of sustainable buildings would, much like energy codes, be considered baseline standards. Across commercial buildings, designers would utilize universal and inclusive design principles to ensure accessibility for those with physical or mental disabilities and comfort for both the neurotypical and neurodivergent.<sup>[90]</sup> Beyond the building itself, residents and occupants would have easy access to natural amenities like parks and trails, safe and reliable public transportation, quality job opportunities, and healthy food. Apart from maximizing profits and mitigating GHG emissions, central objectives to real estate development and operations



## “Sustainability without equity is sustaining inequity.”

— Mandy Lee, Program Manager of the Emerald Cities Collaborative

would include meeting community needs, preventing gentrification, and enhancing social cohesion.<sup>[91]</sup> When building projects are proposed, community members would be invited to participate with architects, planners, and builders throughout the process to ensure the project mitigates negative impacts, aligns with community values, provides new resources, housing, or job opportunities, and honors the community’s legacy and history — leaving the community altogether better off than before the project started.<sup>[92]</sup>

We now know that many social inequities, such as poverty and racism, are in part perpetuated by structures, policies, and norms embedded in our built environment. Therefore, as the real estate industry pushes for environmental protection, equity must fundamentally underly



**Pictured:** Seattle City Council Member Kshama Sawant leading a town hall on affordable housing in 2015. Nearly four years later, after significant community feedback, Seattle’s Mandatory Housing Affordability (MHA) legislation was signed into law in March 2019. The MHA is designed to promote equitable development and municipal livability.<sup>[93]</sup>

each solution. Given that solving environmental crises will require a drastic revisioning and restructuring of the economy, an opportunity is presented to advance social equity and dismantle existing injustices along the way, an idea central to the Just Transition framework.<sup>[94]</sup> Without intentionally considering equity in environmental solutions, it is likely that injustice will be perpetuated. As noted by Mandy Lee, program manager of the Emerald Cities Collaborative, “[s]ustainability without equity is sustaining inequity.”<sup>[95]</sup>

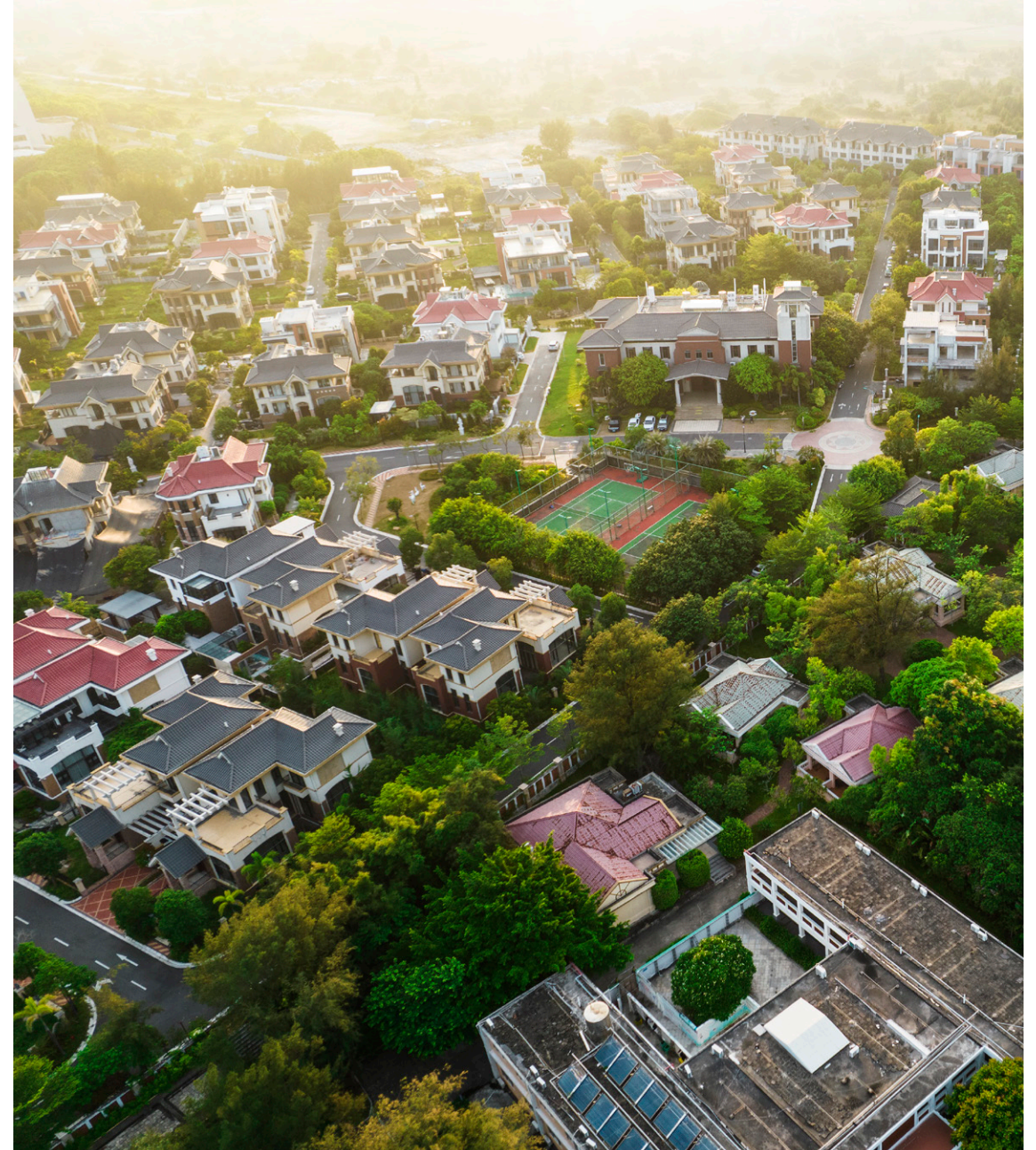
Maximizing equity and social value in the built environment will require a multifaceted strategy, including leadership among real estate industry organizations, top-down incentives from policymakers, shifts in investment practices, and collaboration among developers and communities. Though social outcomes have historically been overlooked, there are signs the industry is being pushed toward a more socially sustainable path.<sup>[96]</sup>

Part of that impetus toward social sustainability derives from the environmental justice movement, which is based on the premise that all people have the right to live in healthy environments and be protected from environmental pollution.<sup>[97]</sup> Borne from the environmental justice movement, climate justice similarly acknowledges that the negative impacts of climate change are distributed inequitably; the people who contributed the least to climate change are disproportionately vulnerable to its impacts.<sup>[98]</sup> These movements, as well as broader social justice activism, are pressing for a new wave of equity-based strategies in the real estate sector.

The 2020 murder of George Floyd and wave of Black Lives Matter protests that followed catalyzed a renewed racial justice movement that has since had far-reaching impacts on society. This movement has led to calls for the real estate industry to acknowledge its role in perpetuating racial injustice and take greater accountability to dismantle racism — the publication of reports such as “10 Principles for Embedding Racial Equity in Real Estate Development” (2022) from the Urban Land Institute (ULI) is among several indicators of the industry’s growing focus on built environment equity.<sup>[99]</sup> The industry is also seeing growing popularity of Community Benefit Agreements — enforceable contracts between community organizations and developers that establish how the project being developed will deliver tangible community benefits such as environmental restoration and job training.<sup>[100]</sup>

On the policy front, the 2022 Justice40 Initiative earmarks 40% of federal investment in climate and clean energy into “communities that are marginalized, underserved, and overburdened by pollution.”<sup>[101]</sup> Further, the 2022 IRA includes tax incentives that direct investment to low-income communities, include prevailing wage and apprenticeship provisions, and improve the affordability of clean energy technologies. Importantly, some of these incentives are aimed at creating clean energy job opportunities in communities that were previously dependent on manufacturing- and fossil fuel-based industries.<sup>[102]</sup> According to an analysis from the Political Economy Research Institute, the IRA is projected to create more than nine million jobs across the next 10 years.<sup>[103]</sup> To address housing cost issues, the 2022 Housing Supply Action Plan aims to increase the supply of quality housing throughout the U.S., starting with a focus on affordable housing in the next three years.<sup>[104]</sup>

The growing popularity of impact investing — a strategy that prioritizes social and environmental outcomes — is an indicator that investors are taking social value more seriously; in 2021, the private impact investing market was worth \$1.2 trillion, a 63% increase from only two years before.<sup>[105]</sup>





...across just a decade, the percentage of S&P 500 companies reporting their annual sustainability efforts rose from 20% in 2011 to 96% in 2021.



## The Business Case for Sustainability: ESG and the Commercial Real Estate Sector

The conversation around sustainability has historically centered around society and the environment, but how do businesses fit in? On one hand, profit-minded businesses have been central to driving most of the world's environmental pollution and degradation since the Industrial Revolution; yet, without the financing, innovation, and leverage businesses possess, it will be near-impossible to achieve the goals of the Paris Climate Agreement, halt and reverse biodiversity loss, and mitigate social inequity and injustice. While public policymaking will undoubtedly play a key role in shaping a more sustainable economy, charting the most efficient path to global sustainability requires presenting a strong business case. This section discusses how the business case for sustainability is being realized in the 21st century through the framework of environmental, social, and governance (ESG), following with the key factors driving commercial real estate (CRE) in a sustainable direction.

## Understanding Environmental, Social, and Governance (ESG) Criteria

**Environmental criteria** examine a company's use of natural resources, waste generation and management, air and water pollution, and risks and opportunities related to climate change and biodiversity loss.

**Social criteria** ask whether the company treats employees and surrounding communities ethically. Social criteria often encompass community relations, product safety, employee health and well-being, human rights, philanthropic donations, and diversity, equity, and inclusion (DEI) practices.

**Governance criteria** relate to fair and equitable decision-making structures, transparency of accounting and business practices, and compliance with laws and regulations. Criteria include executive compensation and oversight, board of director diversity, and annual reporting of company activities.

## The Rise of ESG: From Fringe Concern to Mainstream Investing Strategy

Not long ago, sustainability was conventionally viewed as fundamentally outside the realm of business and investing. It was not just seen as largely irrelevant to business success, but worse, as a concern that would inevitably undermine financial performance and shareholder value.<sup>[106]</sup> Throughout the past 20 years, however, the business landscape has undergone a dramatic transformation. No longer a fringe concern, sustainability is now seen as a fundamental aspect of modern corporate and investor strategy — illustrating this transformation, across just a decade, the percentage of S&P 500 companies reporting their annual sustainability efforts rose from 20% in 2011 to 96% in 2021.<sup>[107]</sup>

To understand what catalyzed this paradigm shift, we must go back to the 2004 U.N. Global Compact publication “Who Cares Wins — Connecting Financial Markets to a Changing World,” where institutional investors first made the case for a new investing framework: environmental, social, and governance, or ESG. The core premise of ESG is that non-financial factors, such as responding to climate change, human rights, and corporate transparency, ought to be included in the scope of investors’ fiduciary duty — not out of altruism, but because they can be financially material, meaning they can feasibly impact businesses’ financial or operating performance.<sup>[108]</sup> Following “Who Cares Wins,” in 2006 the U.N. joined a global group of institutional investors to launch the Principles for Responsible Investment (PRI), a framework designed to help integrate ESG factors into investment decisions with the goal of better long-term returns.<sup>[109]</sup>

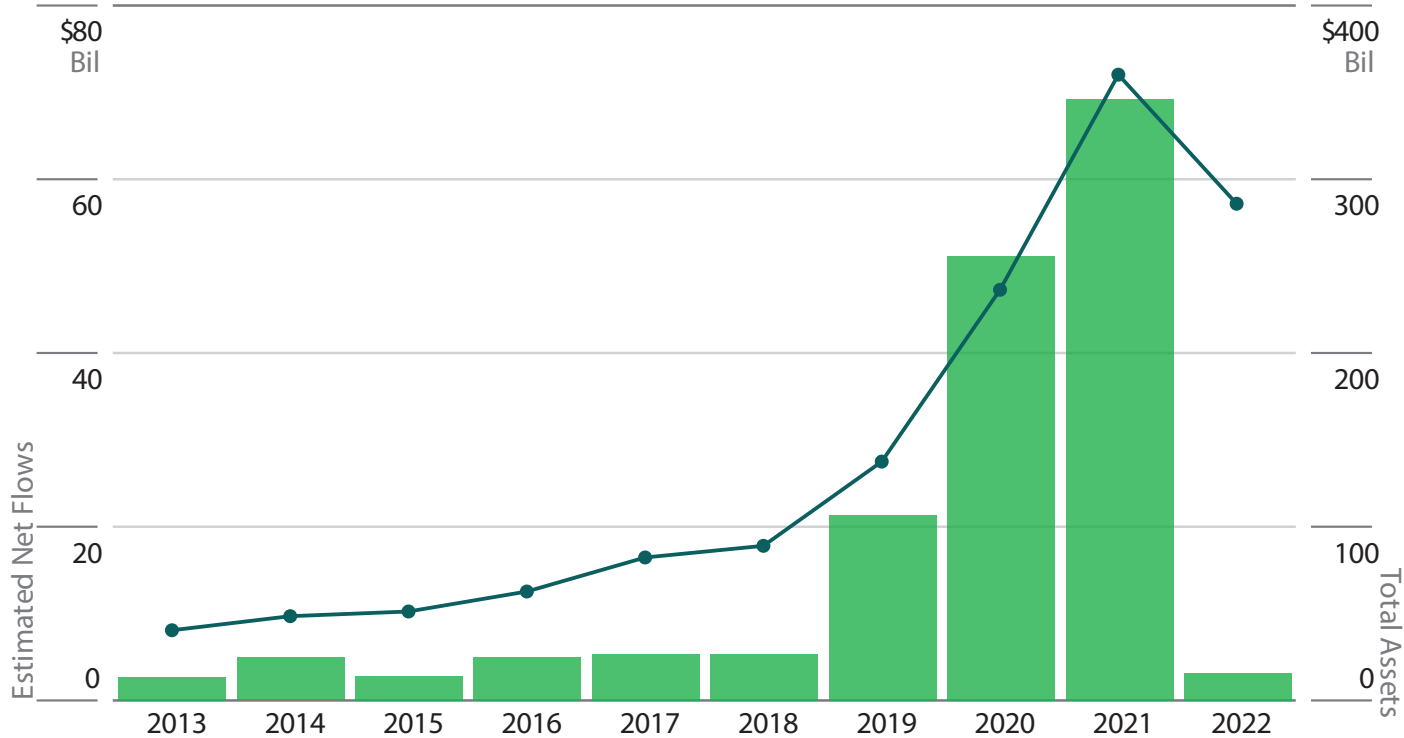
These ESG pioneers were onto a revolutionary idea. Supported by a growing body of evidence that ESG can create value, increase returns, and mitigate risks, ESG finally hit its stride around 2019, positioning it as a mainstay in investor strategy — ESG was mentioned in just 1% of earnings calls between 2005 and 2018, but by 2021, 20% of earnings calls discussed ESG.<sup>[110][111]</sup> Between 2018 and 2021, sustainable fund inflows had increased from only \$5 billion annually to nearly \$70 billion (see Figure 8).<sup>[112]</sup> Whereas no sustainable exchange-traded funds (ETFs) and only one sustainability index existed in 1990, by 2020, there were 268 ESG ETFs and 1,500 ESG indexes.<sup>[113]</sup> Starting with only 63 investors and \$6.5 trillion in assets under management (AUM) in 2006, PRI has since grown to encompass over 3,800 signatories and \$121 trillion in AUM.<sup>[114]</sup> According to the Financial Times, ESG is the “fastest-growing segment of the asset management industry.”<sup>[111]</sup>

## Key Drivers for ESG Adoption in the Commercial Real Estate Sector

Recently, ESG has flourished within the CRE sector, illustrated through the growing popularity of green leases, green building certifications (e.g., BREEAM, ENERGY STAR), real estate-focused net zero emissions initiatives (e.g., ULI Greenprint), and real estate-focused ESG reporting frameworks (e.g., GRESB). Further, approximately 82% of REITs integrate ESG risks and opportunities into their financial planning, 70% have employees dedicated to enhancing DEI, and over half connect executive compensation packages with ESG performance.<sup>[115]</sup> What is motivating CRE to embrace ESG? With financial materiality at the core, primary drivers include risk mitigation, regulatory compliance, operational cost savings, and market competitiveness.



Figure 8. Sustainable funds annual flows and assets: 2013–2022<sup>[112]</sup>



## Risk Mitigation

Risk mitigation — especially regarding climate change — is among the largest factors driving the movement toward ESG and sustainability in the CRE industry.<sup>[116]</sup> As climate change hazards intensify (e.g., hurricanes, floods, wildfires), owners exposed to climate-related physical risks may become more vulnerable to costs related to damaged physical assets, disrupted business operations, and increased insurance premiums. Even gradual increases in temperature and precipitation associated with climate change can accelerate the deterioration of a building, increasing maintenance, operating, and retrofit costs.<sup>[117]</sup> Coincidentally, many physical risks from climate change are predicted to concentrate in

areas containing the most valuable real estate, such as coastal regions; for example, in 2022, Hurricane Ian caused an estimated \$67 billion dollars in damage to southeastern Florida, where flood insurance premiums were already set to increase tenfold over the next 20 years.<sup>[118]</sup> While empirical evidence is still lacking in the CRE sector, current research indicates that climate risk could pose negative impacts to CRE cash flow, capitalization rates, and financing.<sup>[119]</sup>

Apart from physical risks, climate change also presents transition risks (e.g., risks to markets, resource availability, and reputation, as well as risks from policy proliferation and increased regulation) related to more severe climate change impacts and the anticipated transition away from fossil fuels. For regions exposed to severe climate hazards, such as those vulnerable to sea level rise, entire real estate markets may become less desirable, potentially resulting in widespread impacts on economic activity, asset values, and tenant demand.<sup>[117]</sup> Failing to make assets resilient to climate impacts or decarbonize on a Paris Agreement-aligned path (i.e., toward 1.5 °C) could result in assets becoming “stranded,” defined by the Carbon Risk Real Estate Monitor (CRREM) as assets that “fac[e] premature obsolescence or significant write downs” because they no longer meet market demands and/or regulatory requirements.<sup>[120][121]</sup> Among financial institutions surveyed by the U.N. Environment Programme Finance Initiative and CRREM, 50% of participants reported that carbon prices and/or real estate taxes “will have a moderate impact on asset values” and 39% reported that carbon prices “will be essential for strategic decision making.”<sup>[122]</sup>



**Pictured:** Soldiers from the Louisiana National Guard respond to the aftermath of Hurricane Laura in 2020.<sup>[123]</sup>

As the urgency to address climate change intensifies, more real estate companies are aligning with the Task Force on Climate-related Financial Disclosures (TCFD), a framework that provides recommendations on reporting climate-related risks and opportunities to financial markets. Between 2020 and 2021, Nareit members' alignment with TCFD increased from 35% to 62%, while simultaneously, the number of REITs conducting climate change risk assessments increased from 34% to 60%.<sup>[115]</sup> To assess and improve performance on GHG emissions, energy efficiency, resiliency, and other factors that impact climate risk, many real estate owners report to GRESB, a preeminent ESG performance benchmark for global real estate, now covering \$6.9 trillion in gross asset value.<sup>[124]</sup>

With biodiversity loss joining climate change in defining the environmental pillar of ESG, nature-related risks are similarly rising in importance to investors and real estate companies.<sup>[79]</sup> Much like reducing GHG emissions mitigates climate-related financial risks, conserving and enhancing natural capital can help real estate owners mitigate nature-related financial risks by improving resilience to hazards like hurricanes and floods, stabilizing supply chains, bolstering the physical and mental health of communities, and increasing property values.<sup>[115][125][126]</sup> As mentioned previously, the forthcoming TNFD framework — modeled on TCFD — will help companies assess and disclose nature-related risks and opportunities to financial markets.<sup>[83]</sup>

There has also been a growing emphasis on social and governance risks in the CRE sector. In response to the COVID-19 pandemic and concurrent unrest around racial justice, owners have worked to mitigate social risks





by increasing their focus on the health and well-being of employees, occupants, and communities; expanding DEI initiatives; and donating to social justice-focused organizations.<sup>[127]</sup> Among other avenues, companies are also working to mitigate governance-related risks by increasing transparency on company activities and decision-making processes, enhancing the diversity of boards, and mitigating unethical business behaviors (e.g., bribery, corruption, fraud).<sup>[128]</sup>

## Regulatory Compliance

Regulatory compliance is another key driver steering the CRE industry toward sustainability. Complying with or going above and beyond sustainability-related regulations is thought to mitigate financial risks via reducing exposure to fines and lawsuits, improving brand reputation, and preventing asset stranding.<sup>[129][121]</sup> For decades, mandatory building energy codes and energy benchmarking regulations have helped to improve commercial and residential building energy performance globally.<sup>[130]</sup> More recently, there has been an influx of policies and regulations

focused on sustainability disclosures and decarbonization following the Paris Agreement. Through the EU Climate Law, EU directive on Corporate Sustainability Due Diligence, and EU sustainable finance framework (see page 18), the EU is leading the world in creating policy levers that increase transparency on sustainability risks, mitigate social and environmental impacts, and prevent greenwashing.<sup>[131]</sup> In the U.S., the proposed SEC climate-related disclosure rules would similarly mandate transparency of corporate climate-related risks and opportunities, working to shift the CRE market toward GHG emissions reductions and more sophisticated climate risk management practices.<sup>[132]</sup>

## Operational Cost Savings and Market Competitiveness

Arguably, the most tangible business case for sustainable real estate is that green buildings tend to be less costly to operate and offer a competitive advantage. Though green buildings often require an upfront investment compared to conventional buildings, they are also fundamentally designed



to generate less waste and use water and energy more efficiently, resulting in long-term reductions in resource use and, consequently, utility costs.<sup>[133][134][135][136]</sup> Across a global sample of thousands of owners, architects, engineers, and contractors surveyed periodically between 2012 and 2021 for the World Green Building Trends Smart Market Report, participants reported that building green saved an average of 8–10.5% in operational costs within 12 months and 14–17% within five years.<sup>[137]</sup> A 2018 review of the green building literature similarly noted studies which found green buildings used 25%, 28%, and 32% less energy compared to conventional counterparts or the industry average.<sup>[138]</sup> Beyond operating expenses, green buildings also tend to have lower risk and vacancy rates and higher rental premiums and occupancy rates, altogether leading to higher net operating income (NOI) and lower capitalization rates, and by extension, higher valuations and sale prices.<sup>[139]</sup>

Yet, some studies focused on LEED (Leadership in Energy and Environmental Design) — a popular green building certification — suggest green-certified buildings sometimes have worse energy performance than expected after certification.<sup>[135][140]</sup> Results point toward the importance of focusing on energy efficiency during the certification process (as opposed to other factors like water efficiency), aiming for higher certification levels (i.e., Gold, Platinum), ensuring proper building maintenance post-certification, and improving occupants' awareness on how to operate the building most efficiently. Notably, research also shows when LEED buildings are certified for EBOM (Existing Buildings: Operations and Maintenance) or targeted with energy efficiency-focused interventions (e.g., HVAC retrofit), there is a high likelihood of success post-certification.<sup>[136]</sup>

Financial implications may also extend from the health and well-being benefits offered by green buildings to building occupants. In addition to reducing resource consumption, green buildings are typically designed to provide more daylight and views of nature, as well as improved air quality; these improvements result in a healthier and more comfortable indoor environment and contribute to improved cognitive function and productivity.<sup>[141][142]</sup>







# Challenges and Opportunities in ESG and Sustainable Real Estate

Despite the potential for sustainable real estate to play a sweeping role in mitigating the climate crisis, improving health and well-being, and bolstering financial performance, there remain significant barriers that the ESG industry — and by extension the sustainable real estate industry — must overcome to garner widespread credibility and expand adoption of its values and strategies.

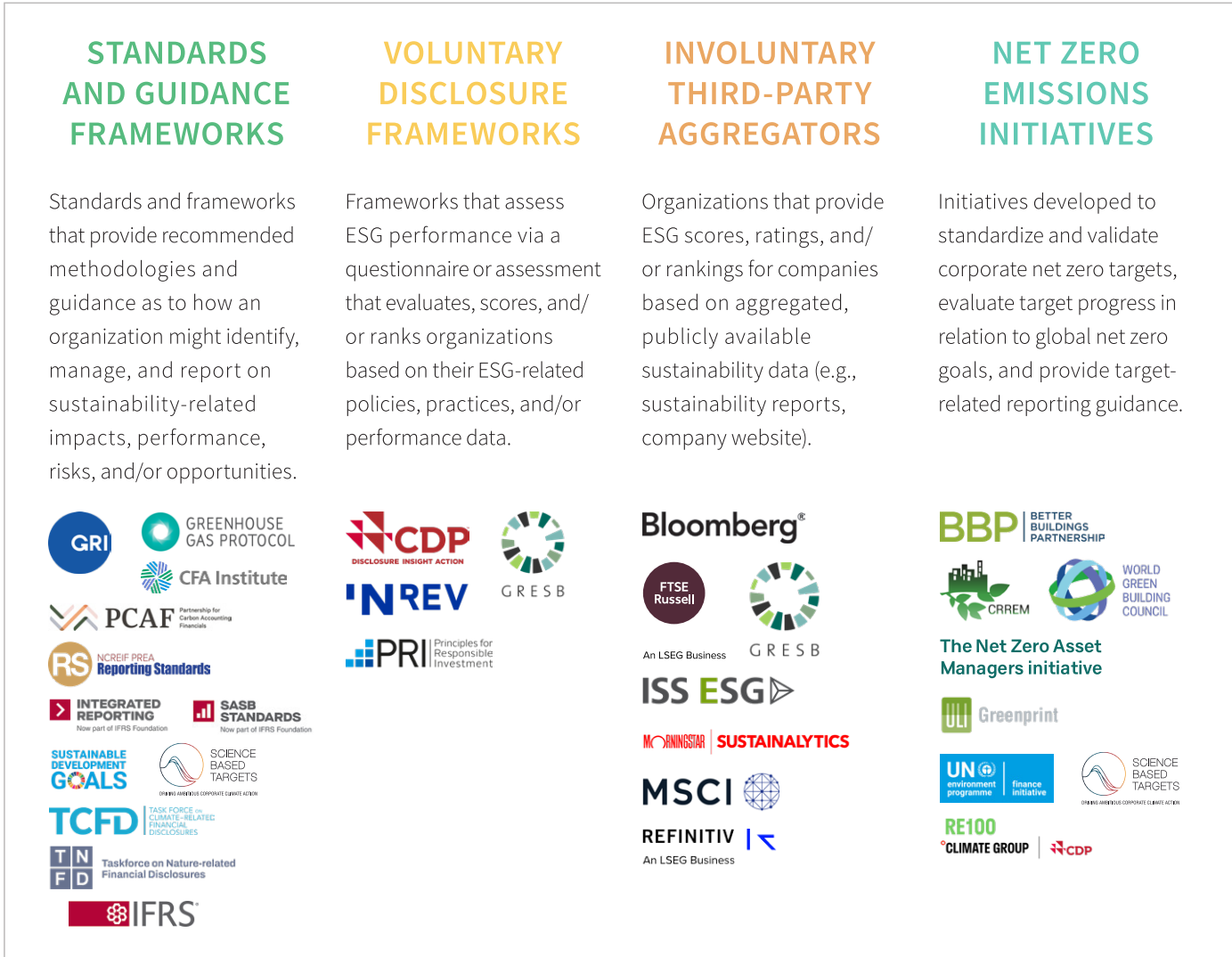
ESG's unregulated and market-driven spread has allowed for rapid innovation and acceptance of corporate sustainability, leading to a plethora of corporate sustainability practices, forms of measurement, and methods of reporting. Covered in our guidance report “Navigating ESG Reporting Frameworks: A Comprehensive Guide,” there are myriad approaches to identifying and reporting on ESG performance, impacts, and risks (see Figure 9). Many reporting frameworks allow for a wide degree of flexibility, and only some require adherence to strict standards and methodologies (e.g., GRI, GHG Protocol). While this flexibility provides the benefit of a tailored approach, the lack of standardization, reliability, and coverage of ESG data impedes institutional investors' ability to compare ESG performance across industries and make strategic capital allocation decisions.<sup>[143]</sup> In the same vein, investors commonly make ESG-related decisions using ratings from data

aggregators (e.g., MSCI, Sustainalytics, and ISS) that identify, measure, and weight ESG issues using diverse methodologies, unsurprisingly leading to poor alignment between ratings.<sup>[144]</sup>

To the relief of both companies and investors, the ESG reporting industry has recently shown a trend toward framework consolidation, making way for greater standardization and simplification of decision-useful sustainability data. In 2022, the Value Reporting Foundation, which managed the Sustainability Accounting Standards Board (SASB) and Integrated Reporting, along with the Climate Disclosure Standards Board, consolidated to form the International Financial Reporting Standards (IFRS) Foundation.<sup>[145]</sup> A standard setting board within the IFRS Foundation, the International Sustainability Standards Board, is currently developing the IFRS Sustainability Disclosure Standards, which are intended to act as a “comprehensive global baseline of sustainability disclosures” and will align with other major frameworks like GRI and TCFD.<sup>[146]</sup>

The absence of regulated ESG investing and reporting has also made way for greenwashing — making false or misleading claims about sustainability — to become another significant issue compromising ESG's credibility. In a 2021 report from InfluenceMap, researchers assessed 723 ESG and climate-themed equity funds and found 71% and 55% respectively misaligned with the Paris Agreement's emission reduction targets, despite being marketed as “low carbon,” “energy transition,” or “clean energy.”<sup>[147]</sup> Beyond consideration of GHG emissions, ESG funds can vary widely in terms of what investments are considered sustainable enough to be included; whereas some ESG funds adhere

Figure 9. Top ESG reporting frameworks<sup>[153]</sup>



to strict standards around factors like water conservation or board diversity, some ESG funds may only exclude tobacco, alcohol, or weapons investments.<sup>[148]</sup> Illustrating the need for stricter regulations on ESG labeling, in 2021 the U.S. SEC published a risk alert revealing that many investment firms made unsubstantiated and misleading marketing claims around ESG funds' risk and return metrics, and that firms often lacked formal documentation on the extent to which ESG was considered in their investment practices.<sup>[149]</sup>

In line with the trend toward standardization in voluntary ESG reporting, regulators in the U.S., EU, and Asia-Pacific markets are moving toward mandatory ESG reporting, a shift that would both mitigate greenwashing and offer investors more complete and standardized disclosures. Starting in 2023, the EU's Taxonomy Regulation will begin requiring companies and financial products to disclose the extent to which their activities are sustainable, according to standardized, industry-specific technical screening criteria; similarly, SFDR requires that EU financial market participants report on adverse sustainability impacts and provide substantiation for marketing claims around sustainability.<sup>[150][151]</sup> In addition to the SEC's proposed climate risk disclosure rules mentioned previously, in 2022 the SEC adopted rules that combat false ESG advertising and proposed rules that would both prohibit investors from making misleading ESG claims and require disclosures from ESG funds.<sup>[152]</sup>

For a comprehensive look into the ESG reporting landscape, see VIBE's recent guidance report: [Navigating ESG Reporting Frameworks](#).





Zooming out, ESG has been critiqued more generally in terms of its capacity to address environmental and social issues.<sup>[154]</sup> While some ESG reporting frameworks prioritize assessing companies' on their sustainability impacts (e.g., GRI), many popular frameworks only focus on impacts insofar as they are financially material to the performance of the company (e.g., SASB, IFRS, S&P Global CSA, GRESB); similarly, ESG scores from major aggregators like MSCI and Sustainalytics reflect exposure and management of financially material ESG risks and opportunities.<sup>[153]</sup> However, it is undeniable that the adoption of ESG and corporate sustainability has a positive impact on companies' environmental and social practices. Through the lens of financial materiality, ESG has encouraged corporations to prioritize sustainability, and this voluntary approach has shown promising results, demonstrating an important step toward a sustainable economy. Additionally, with policies like the EU Taxonomy, SFDR, and CSRD, it is encouraging to see regulations pushing corporate sustainability toward a more holistic approach that takes both financial and impact materiality into account (i.e., double materiality).

It is also important to mention the “ESG backlash” or “anti-ESG movement,” which gained attention in the mainstream media during 2022. As ESG continues to grow as an investment and business strategy, conservative factions in the U.S. are leading a push to reduce the influence of ESG, claiming the investment strategy is part of a left-wing political agenda aimed at boycotting fossil fuel companies and promoting liberal policy priorities.<sup>[155][156]</sup> Many also argue that ESG investing violates antitrust laws and poses a threat to the U.S. economy and capital markets.<sup>[157]</sup> <sup>[158]</sup> Several states (e.g., Texas, Oklahoma, and West Virginia) have responded by enacting bills that prohibit state investment entities, such as pension funds, from investing in companies that boycott the fossil fuel industry.<sup>[159][160]</sup>

As of early 2023, however, there are signs that some conservative states are reconsidering their anti-ESG stance. In North Dakota and Indiana, conservative lawmakers voted down anti-ESG bills that would have prohibited states from working with investment firms that consider ESG.



These bills were seen as conflicting with investors' fiduciary duty and potentially threatening the state's investments and economy.<sup>[161]</sup> Moreover, a 2023 analysis estimated that taxpayers in six states (e.g., Kentucky, Florida) could face over \$700 million in additional interest charges due to anti-ESG laws.<sup>[162]</sup> Despite the backlash against ESG, there is little evidence to suggest that the movement is significantly undermining progress around corporate sustainability. Though the backlash has motivated some companies to avoid publicizing their ESG programs and targets, the overall trend toward ESG among corporations and investors appears to remain strong.<sup>[163]</sup>

Shifting focus from ESG and back to sustainable real estate as a whole, we must acknowledge the often-overlooked socioeconomic impact of green buildings and green infrastructure in general.<sup>[164]</sup> Unfortunately, the same financial benefits of green buildings for owners and investors (i.e., increased rental premiums and property values) can contribute to increased cost of living throughout a neighborhood and result in displacing low-income or BIPOC communities; this is otherwise known as green gentrification.<sup>[165]</sup> At least one study has attributed green gentrification to green building certifications, measured by gentrification indicators like higher median rent and educational attainment.<sup>[166]</sup> To end the causal relationship between green building and environmental injustice, it is critical that the real estate industry work to actively engage local communities throughout the entire building process, plan for a significant percentage of affordable housing, and grant more weight to social equity criteria in green building certification programs, something that may be in the future

for the next version of LEED, v5.<sup>[167]</sup> However, market-wide adoption of these practices would likely demand policymaking that requires a baseline standard of social equity in urban planning and incentivizes builders to develop sustainable housing accessible to a variety of income levels.

More broadly, lack of focus on social outcomes is a growing critique of sustainable real estate and ESG generally. In the real estate sector, ESG has historically centered on environmental issues like energy, water, and waste reduction — issues that are both financially material and relatively straightforward to quantify, manage, and report against. In contrast, social issues are more ambiguous and qualitative in nature (e.g., employee mental health, inclusivity), making them more difficult to measure and, consequently, making it more difficult to demonstrate that improvements impact financial performance. It has also been noted that social issues in ESG are primarily viewed through a risk mitigation lens (e.g., human rights violations) instead of assessing how positive social impacts (e.g., investing in local communities) present opportunities to drive performance. To better account for companies' social impact, there is a need to improve standardization and quantification around social metrics so they can be benchmarked, and so outcomes can be compared on an apples-to-apples basis between companies and industries.<sup>[168]</sup>



# Key Takeaways

## Understanding the Climate Crisis

- Climate change presents an urgent threat to the environment, society, and economy.
- On our current warming trajectory, Earth could lose up to 29% of terrestrial species by 2100; by 2050, 359 million people could be displaced, and global GDP could be reduced by 10%.
- The 2015 Paris Climate Agreement states it is essential to limit global warming to only 1.5 °C.
- We must accelerate climate mitigation efforts — experts estimate a 50% probability the world will exceed 1.5 °C between 2022 and 2026.

## The Impact of Buildings on the Climate Crisis, Biodiversity, and Social Equity

- The buildings and construction industry represents the single-biggest source of energy consumption (34%) and carbon emissions (37%) globally.
- The industry is not decarbonizing quickly enough. To stay on track with the IPCC's 45% emissions reduction target by 2030, the industry must reduce emissions by around 8.3% per year.
- Through urbanization, the building material life cycle, and climate change, buildings and infrastructure negatively impact 29% of Earth's (near-) threatened species.
- In the U.S., BIPOC communities are more likely to live in substandard housing, resulting in higher energy costs, a disproportionate amount of physical and mental health issues, and higher likelihood of exposure to environmental and climate hazards.
- Globally, over a billion people live in informal settlements that lack adequate building codes and public services.



## Recent Progress Toward a Sustainable Future

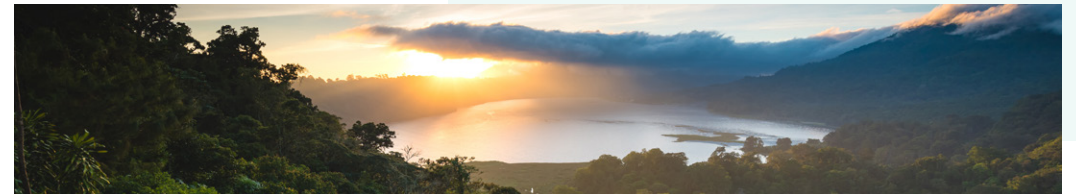
- The U.S. and the EU have set net zero targets, paving the way for more ambitious policies and regulations on climate.
- Forthcoming frameworks from the TNFD and Science Based Targets Network will help companies report on biodiversity risks and set targets to mitigate negative impacts on nature.
- In 2022, world leaders signed the Kunming-Montreal agreement, which calls for the protection of 30% of terrestrial and marine ecosystems by 2030.
- U.S. policies like the IRA and initiatives like Justice40 are helping to push clean energy investment and jobs toward low-income communities.

## Strategies for Success in Sustainable Real Estate

- Lean on energy efficiency, electrification, and other existing strategies to decarbonize buildings and construction by 2050.
- Zero-carbon-ready energy codes: mandate for all new buildings by 2030 and retrofit 85% of the world's existing buildings by 2050.
- Reduce urban sprawl, minimize building footprints, and support the preservation, restoration, and connectivity of greenspace.
- Align development with community values; ensure it provides new resources (e.g., jobs, housing) and leaves communities better off than before projects began.
- Center social equity in the process of finding solutions to environmental crises like climate change.

## The Business Case for Sustainable Real Estate

- Environmental, social, and governance (ESG) is an investing framework that argues non-financial factors (e.g., climate change mitigation) should be included in investors' fiduciary duty because they can be financially material and impact businesses' long-term performance.
- Risk mitigation, regulatory compliance, and motivation to reduce operating costs and increase market competitiveness are the main drivers of ESG's rapid expansion in commercial real estate.



## Challenges and Opportunities in ESG and Sustainable Real Estate

- In the face of criticism around ESG data standardization and greenwashing, regulators and standard setters are pushing for ESG framework consolidation, globally applicable reporting standards, and mandatory ESG disclosures.
- Driven by investor demand, market forces, and regulatory pressure, sustainable real estate continues to mature as an industry. As climate change and other sustainability crises worsen, CRE companies are rising to the occasion and raising the bar on ESG performance year after year.
- Through centering the built environment in our global sustainability strategy, a brighter, healthier, and more prosperous future will inevitably begin to take shape. While recognizing that challenges undoubtedly lie ahead, the reward of creating an environment, society, and economy future generations are proud to inherit makes the effort all the more worthwhile.





## Conclusion

The real estate industry has the potential to be a major player in the fight against climate change, biodiversity loss, and social inequity. With buildings and construction being a significant source of CO<sub>2</sub> emissions (37%), it is crucial that the industry takes swift action to reduce its carbon footprint, both operationally and across the supply chain. While progress to date has been slow, momentum is still possible for the industry to achieve net zero emissions by 2050 and to play a vital role in fulfilling the goals of the Paris Agreement. Recently, the industry has also begun to focus on the opportunities and growing reporting requirements related to the biodiversity crisis and is exploring ways to better integrate nature into the built environment. Furthermore, there is a growing demand for more equitable and socially responsible real estate development and urban planning.

As the urgency of environmental issues continues to escalate, the economic case for sustainability becomes stronger. Companies and investors are recognizing the financial benefits of managing environmental, social, and governance (ESG) issues and governments are implementing regulations to combat greenwashing, fund the clean energy transition, and promote transparency in sustainability reporting. As we brace ourselves for the challenges ahead, it is encouraging to see continuous growth in corporate sustainability and sustainable real estate. With this progress, we are reminded that a sustainable future may indeed be within reach.





## About VIBE

The Verdani Institute for the Built Environment (VIBE) is a San Diego, California-based nonprofit organization with the mission to position the global building sector as a positive force for sustainable development through green building and resilience practices, education, and collaboration. This guidance report is the second publication under the umbrella of VIBE's Sustainable Built Environment series. VIBE was founded in 2016 by Daniele Horton, a leader in the rapidly growing green building and corporate sustainability industries.



## About Verdani Partners

Verdani Partners is a leading full-service consulting firm with team members who have over 25 years of experience in real estate, sustainability, and ESG. Verdani manages ESG programs for 21 real estate firms representing \$660 billion AUM and over 8,900 properties across 1.3 billion square feet of diversified portfolios. As an owners' representative for ESG program management, Verdani helps our clients accelerate portfolio performance, minimize risk, and create long-term value by implementing comprehensive strategies including resilience, decarbonization and net zero, healthy buildings, biodiversity, DEI, data management, green building certifications, ESG framework, regulatory and sustainability reporting, annual reporting, and stakeholder engagement.



## About RE Tech

As a sustainability advisor, RE Tech designs and implements award-winning programs to decarbonize and improve sustainability performance. Their interdisciplinary team creates customized solutions that unlock value, fulfill investment objectives, and pioneer the transition to a low carbon economy. Headquartered outside of Washington, D.C., RE Tech supports real estate clients representing 1.2 billion+ square feet and \$1.5 trillion AUM, as well as climate partnership programs, such as the US DOE Better Buildings Program and the US EPA ENERGY STAR® Program.



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