



EPRA
EUROPEAN PUBLIC
REAL ESTATE ASSOCIATION

Green Governance

A holistic approach for feasible and successful Net Zero
Transition Plans in the real estate industry

April 2024

Supported by



Partners / sponsors



EPRA
European Public Real
Estate Association



UNEP FI
UN Environment
Programme Finance
Initiative

Best Practice Partners



This whitepaper is published by IIO and the CRREM initiative with the support of EPRA (The European Public Real Estate Association is a non-profit organization representing the interests of European listed real estate companies) and UNEP FI (The United Nations Environment Programme Finance Initiative).

We would like to thank all of our interview partners for supporting us with the project. We would also like to thank Dr. Glenn Leihner-Guarin for his comprehensive proof-reading of our report!

A few words from our partners



CRREM Initiative

Prof. Dr. Sven Bienert, MRICS REV

Large parts of the real estate industry have recognized the need to decarbonize their sector. Net Zero Commitments are a step in the right direction, but the implementation of Net Zero strategies and the corresponding transition plans often fall short of these commitments, unknowingly exposing many companies to a risk of litigation and accusations of greenwashing. The real estate industry must therefore be more transparent and efficient in implementing its Net Zero commitments, addressing the full scope of emissions and taking immediate and sincere action.

The Green Governance approach aims to support market participants in setting, implementing and assessing their corporate Net Zero commitments, as well as providing real world best practices and proposing the necessary measures to be taken. We believe that it is only by taking this holistic approach that companies will be able to effectively mitigate their transition risk and achieve their long-term carbon reduction goals.



European Public Real Estate Association (EPRA)

Hassan Sabir

It is a privilege for me to lead our journey toward Green Governance in the European Listed Real Estate (LRE) sector on behalf of EPRA. Our association's mission and vision extend beyond advocacy; we are setting a standard for excellence in sustainability that encompasses economic, environmental, and social dimensions. Initiatives like EPRA's Sustainability Best Practices Recommendations (sBPR) and the sBPR Awards demonstrate our commitment to transparency and excellence, encouraging the LRE sector to adopt sustainable practices that benefit the economy, the planet, and our communities.

This white paper embodies our dedication to sustainable development within LRE. It outlines the current regulatory environment with its risks and opportunities, simplifies ESG concepts, and points to strategies and practical tools for achieving Net Zero emissions. Our aim is to empower industry stakeholders to transform real estate into a force for good, leading the way in environmental stewardship and community well-being.

The journey to sustainability is challenging and our view is that only collective effort and commitment will be the solution to achieve a sustainable and resilient LRE sector promising a better future for all.



UNEP FI

David Carlin

Since 2017, UNEP FI has engaged with financial institutions through its Climate Risk and the Taskforce on Climate-related Financial Disclosure (TCFD) programmes to develop tools, frameworks, and guides aimed at aiding financial institutions in identifying, assessing, managing, and disclosing climate risks. Along that journey, CRREM has been an indispensable partner in the real estate sector.

The real estate sector represents nearly 40% of global emissions, and perhaps 2/3rds of the buildings today will still be standing in 2030. Therefore, the quest for a sustainable Net Zero future runs through the built environment. UNEP FI worked with CRREM and its innovative approaches to help financial institutions determine the actions they could take to reduce emissions in their real estate assets and manage potential transition risks.

Ever more organizations in the real estate sector have been establishing emission reduction targets. These are critical to deliver Net Zero and to mitigate transition risk. However, success will be determined by the actions taken, rather than the commitments made. Continuing on the decarbonization pathway requires robust governance throughout the organization, particularly in addressing sustainability risks. From senior executives and the board to the different divisions of a firm, effective governance implies a rethink of roles and responsibilities.

This report offers a valuable framework for the implementation of green governance within firms in the real estate sector. It focuses on specific measures for setting targets and formulating feasible strategies, aligning organizational structures with transition plans, and establishing monitoring and reporting commitments through a self-assessment tool. The report not only presents opportunities for financial institutions to enhance their own governance procedures but also emphasizes their role in supporting clients with successful transition plans and achieving climate goals. It underscores the importance of sound governance in ensuring accountability and meeting the challenges the transition will present.



IIGCC

Hugh Garnett

IIGCC has been a long-term supporter of CRREM, recommending the methodology to asset owners and asset managers to assess alignment of real estate assets to Net Zero in the Net Zero Investment Framework. We welcome this latest publication on climate transition governance and its identification of best practice for real estate investors. Strong governance of climate risk and ensuring that investors have the appropriate governance structures in place to meet their

targets and commitments will be essential to take the urgent action that we need to decarbonize the real estate sector.

Foreword



Susanne Eickermann-Riepe FRICS

**Royal Institute of Chartered Surveyors (RICS) –
Chair of the RICS European World Regional Board**

**Institute for Corporate Governance in the
German Real Estate Industry (ICG) – Chair of
the Board of ICG Institute Germany**

Governance Needs to Become Green

Companies around the world are increasingly alert to the climate emergency. They face calls from a growing range of stakeholders to take responsibility for the impact of their activities. Companies now have public climate strategies and targets in place, many of which include pledges that appear to significantly reduce or even eliminate their contributions to global warming. The rapid acceleration of corporate climate pledges, combined with the fragmentation of approaches, means that it is more difficult than ever to distinguish between real climate leadership and unsubstantiated greenwashing.

Demand for Transparency

It is no secret that being transparent carries inherent risks, as a result of public statements on SDGs and related measures very quickly coming under scrutiny. However, there are also many opportunities to be found in disclosure: it is an intangible asset for companies. As stakeholders increasingly refer to ESG information while making decisions, there will be a growing demand for that information to be accurate, consistent, comparable, relevant, and trustworthy.

There is no question that these criteria apply when discussing financial data. The success and value of the company, the remuneration accorded the management, the demand of the market, and the trust of investors, banks, customers, and society are all linked to and influenced by this data. There is a comprehensive governance system that defines the criteria: this includes the rules for supervising, management, and auditing. When it comes to non-financials there is no reason why the system should look any different.

Sustainable Placemaking

The world is rapidly changing, and sustainability is taking center stage. Business management is no longer solely about being responsible for just assessing economic impact and risks. Managing a business today means being aware of the economic, social, and environmental risks to which a company is exposed. In terms of 'double materiality', a company's board of directors must take into account not only the risks to the company (outside-in), but also the risks caused by the company to the environment, stakeholders, and society as a whole (inside-out). This new responsibility is compounded by a general lack of regulatory oversight at the international, national, and sectoral levels. Identifying and promoting real climate leadership, while distinguishing it from greenwashing, is a key challenge.

Awareness and Action

Although uncertainty is driven by actual crises, regulation, and a plethora of open questions on how to become green without missing one's financial targets, discussions that seek to separate being green from being successful must end: we cannot afford to surrender our planet nor shirk our responsibility to subsequent generations. In order to turn discussion into action, we desperately need to create a Green Governance. This is not just one system or solution, but a complex combination of sufficient capabilities, data, technology, processes, and structures. This complex is given impetus by the top-level of management, but also enfolded and accrues the necessary capabilities and knowledge throughout the organization.

It is incumbent on us to build better boards, taking into consideration the type and size of a company, and then publishing a competency matrix that shows that endeavors to completely eliminate any blind spot in order to take the optimal decision in an ever-changing environment. It must be made clear that financials and non-financials interact when reporting on the percentage of sustainable business. The management needs to be reliable in order to work on what they pledge that they have made. Remuneration should include pay for sustainability and should be contingent on hitting non-financial targets. Green Governance is no mere call to action but a vital necessity that prepares the company and its individuals for the audit trail on non-financials.

This report aims to show that the industry is comprehensively concerned with showing how a successful Net Zero Transition Plan can look like and making manifest the framework conditions that need to be considered. In dealing with the requirements, chances, and risks but also seeking necessary solutions, this report will help us to effect a positive change in the built and natural environments.

Authors



Institut für Immobilienökonomie
Institute for Real Estate Economics
(IIÖ, Austria)

Carbon Risk Real Estate Monitor

Sven Bienert, Ben Höhn, Yannick Schmidt

Citation

Bienert, Sven; Höhn, Ben; Schmidt, Yannick (2024): Green Governance – A holistic approach for feasible and successful Net Zero Transition Plans in the real estate industry, Wörgl, Austria.

Editor: IIÖ Institut für Immobilienökonomie GmbH, Josef-Steinbacher-Straße 1, A-6300 Wörgl, Austria

Contact: info@crrem.eu, yannick.schmidt@iioe.at

Date: April 2024

ISSN: 2663-7634

Copyright: The content of this report is property of the CRREM initiative. Its use, copying, circulation, translation, micro storage, storage and processing using electronic systems for commercial or other purposes is only allowed within the frame of the applicable legal regulations.

About CRREM

The Carbon Risk Real Estate Monitor (CRREM) initiative has derived decarbonization pathways that translate the ambitions of the Paris Agreement (to limit global warming to 1.5°C by the end of the century) into regionally- and property-type-specific trajectories against which real estate assets and portfolios can benchmark themselves. The pathways and the developed freeware tool can be used to derive quantitative figures regarding 'transition risk' (in this case, the risk of assets being stranded due to regulatory non-compliance or market obsolescence). The not-for profit-initiative is supported by the EU Commission, Laudes Foundation, as well as APG, PGGM, Norges Bank Investment Management (NBIM). CRREM is the leading global source for benchmarks to reduce the operational carbon footprint of the built environment. The initiative is aligned with SBTi, PCAF, EPRA, INREV, IIGCC, NZAOA and many other global initiatives and organizations.

Disclaimer: The sole responsibility for the content of this publication lies with the authors. The CRREM/IIÖ initiative do not accept any liability to any third party in respect of this report or any actions or decisions made as a consequence of the results, advice, or recommendations set forth herein. This report does not represent investment advice or provide an opinion regarding the risk or rentability of any transactions to all parties. No warranty is given as to the accuracy of the subsequent information.

Acronyms and abbreviations

AGM	Annual General Meeting	GABC	Global Alliance for Buildings and Construction
AIGCC	Asia Investor Group on Climate Change	GDP	Gross Domestic Product
ASX	Australian Securities Exchange	GdW	Bundesverband deutscher Wohnungsimmobilienerunternehmen e.V.
AT	Austria	GER	Germany
AuM	Assets under Management	GFANZ	Glasgow Financial Alliance for Net Zero
BaFin	Federal Financial Supervisory Agency	GGBS	Ground Granulated Blast-Furnaced Slag
BAU	Business as usual	GHG	Greenhouse Gas
BCBS	Basel Committee on Banking Supervision	GPE	Great Portland Estates
BPIE	Buildings Performance Institute Europe	GRESB	Global Real Estate Sustainability Benchmark
BREEAM	Building Research Establishing Environmental Assessment Methodology	GRI	Global Reporting Initiative
CA100+	Climate Action 100+ Net Zero Company Benchmarking	HR	Human Resources
CapEx	Capital Expenditures	IAS	International Accounting Standard
CBRE IM	CBRE Investment Management	ICAP	International Carbon Action Partnership
CDP	Carbon Disclosure Project	ICP	Internal Carbon Price
CDSB	Climate Disclosure Standards Board	IEA	International Energy Agency
CEO	Chief Executive Officer	IFRS	International Financial Reporting Standards
CFO	Chief Financial Officer	IIGCC	The Institutional Investors Group on Climate Change
CO₂	Carbon Dioxide	INREV	European Association for Investors in Non-Listed Real Estate
CRREM	Carbon Risk Real Estate Monitor	IPCC	Intergovernmental Panel on Climate Change
CSR	Corporate Social Responsibility	IPMS	International Property Measurement Standard
CSRD	Corporate Sustainability Reporting Directive	ISSB	International Sustainability Standards Board
CTP	Climate Tipping Points	ISA	International Standards on Auditing
DWS	Deutsche Gesellschaft für Wertpapiersparen	IT	Information Technology
e.g	exempli gratia – for example	JLL	Jones Lang LaSalle
EC	European Commission	KPIs	Key Performance Indicators
ECB	European Central Bank	kWh	Kilowatt hour
EFRAG	European Financial Reporting Advisory Group	LCA	Life Cycle Assessment
EPBD	Energy Performance of Buildings Directive	LEED	Leadership in Energy and Environmental Design
EPC	Energy Performance Certificate	LRE	Listed Real Estate
EPRA	European Public Real Estate Association	m²	Square meters
EPRA sBPR	EPRA Sustainability Best Practice Recommendations	MD	Managing Director
ESAs	European Supervisory Authorities	MEPS	Minimum Energy Performance Standard
ESG	Environmental, Social und Governance	NDCs	Nationally Determined Contributions
etc.	et cetera	NFDR	Nationally Determined Contributions
EU	European Union	NGOs	Non-Governmental Organization
EU ETS	European Union Emissions Trading System	NYC	New York City
FCLT	Focusing Capital on the Long Term	NZAM	Net Zero Asset Manager Initiative
Fed	Federal Reserve Bank	NZAOA	Net Zero Asset Owner Alliance
FMA	Financial Market Authority (Austria)	NZC	Net Zero Carbon
FTE	Full Time Equivalent	NZEB	Nearly zero-emission building
G7	Group of Seven (Canada, France, Germany, Italy, Japan, UK, USA)	NZFSPA	Net Zero Financial Service Provider Alliance
		NZIA	Net Zero Insurance Alliance
		NZICI	Net Zero Investment Consultants Initiative
		NZIF	Net Zero Investment Framework

OECD	Organization for Economic Cooperation and Development	SRI	Socially Responsible Investment
OpEx	Operational Expenditures	TCFD	Task Force on Climate-Related Financial Disclosures
PAAO	Paris Aligned Asset Owners	ULI	Urban Land Institute
PAREF	Paris Realty Fund	UN	United Nations
PCAF	Partnership for Carbon Accounting Financials	UNEPFI	United Nations Environment Programme Finance Initiative
PFA	Perfluoro alkoxy polymers	UNFCCC	United Nations Framework Convention on Climate Change
PRI	Principles for Responsible Investment	UNGC	United Nations Global Compact
PV	Photovoltaic	US	United States
REIT	Real Estate Investment Trust	US SEC	United States Securities and Exchange Commission
RICS	Royal Institution of Chartered Surveyors	US-BPS	United States Building Performance Standards
SASB	Sustainability Accounting Standards Board	WEF	World Economic Forum
SBTi	Science Based Targets initiative	WGBC	World Green Building Council
SDGs	Sustainable Development Goals	WLCN	Whole Life Carbon Network
SEC	Securities and Exchange Commission	WWF	World Wildlife Fund
SFDR	Sustainable Finance Disclosure Regulation		
SHECS	Safety, Health, Environment, Community and Sustainability		

Content

- 1. Executive Summary..... 13
- 2. Outline and Approach 17
- 3. Global Race to Net Zero: The Corporate Perspective 21
- 4. Why not Wait until Forced to Act? – Risks and Opportunities Related to Net Zero Strategies 27
- 5. Sector Challenges Impacting the Framework 33
 - 5.1 Mind the Gap – Commitments Require Corresponding Measures 34
 - 5.2 Greenwashing – Once Regarded as a Trivial Offense, Today Legal Consequences Loom 35
 - 5.3 Being Ahead of the Curve – Wave of Regulations 39
 - 5.4 Corporate Transformation – Holistic View Required 44
 - 5.5 Put a Price Tag on Change – Penalization vs. Incentivization 45
- 6. Green Governance Enabling Net Zero Commitments 48
 - 6.1. The Net Zero Jungle – A Structured Overview 49
 - 6.2 Defining Green Governance – Helpful Concept or Just a New Buzzword? .. 53
- 7. Green Governance Implementation – A Framework from Signing to Operational Measures 58
 - 7.1 A Structured Process – the Key to Success 59
 - 7.2 Determining Relevance, Transition Risks, and Status Quo 65
 - 7.3 Setting Suitable Targets and Developing a Feasible Strategy 70
 - 7.4 Aligning the Organizational Structure 77
 - 7.5 Choosing the Right Operational Measures 81
 - 7.6 Monitoring and Reporting your Net Zero Commitment 92
- Definitions 102
- Recommended Literature 104

1. Executive Summary



1. Executive Summary

Net-Zero on the Rise: Although the world is still far from the Paris-aligned 1.5-degree trajectory – regulation to push for Net-Zero by 2050 is tightening around the globe. All market participants acknowledge significant pressure due to increasing climate risk, while politicians, investors, and the general public expect companies to decarbonize their businesses. Real estate is a favored sector for political interventions, given the perception that costs for emissions abatements are relatively favorable compared to other sectors. We note that rising interest rates and a recessionary environment in some global real estate markets might slow down some efficiency efforts due to cost-benefit considerations in the short term. Nevertheless, all real estate investors agree that decarbonization will remain high up on the agenda.

Net Zero

Cutting greenhouse gas emissions to as close to zero as possible usually by electrification and preferably on-site renewable energy, with any remaining emissions re-absorbed from the atmosphere, by oceans and forests for instance. This includes decarbonization of the entire value chain (Scope 3)¹.

Difference to Carbon Neutrality

Net Zero prioritizes emission reduction over carbon sequestration, whereas Carbon Neutrality aims for a balance between greenhouse gases emitted and removed from the atmosphere, often through offsets. Unlike Net Zero, Carbon Neutrality doesn't necessarily mandate emission cuts. However, it faces criticism for relying on carbon sequestration products of varying quality and availability.

Understanding Fundamental Shifts: From a corporate perspective there is a clear need to look at Net Zero as more than an ongoing pain point driven by constantly tightening regulation. Clearly, climate risks can erase business models, lead to stranding of certain assets, and trigger downsides for the balance sheet. But decarbonization is about much more than costs: with the right countermeasures, the transition can also create new opportunities. For those at the forefront, a wide range of new business cases, potential additional income and increased market penetration will be the result. However, research shows that many real estate investors and asset managers still underestimate the fundamental shifts and changes required.

1 Definition based on UN (2024).

Greenwashing or Simply Insufficient Measures: Our research confirms that an ever increasing number of real estate investors are setting decarbonization targets and publicly announcing their adherence to a Net Zero by 2050 pledge. Nevertheless, measures undertaken are often simply not sufficient to reach the defined targets. Laggards expose their companies to higher transition risks, as well as greenwashing accusations and litigation risks. We conclude that a pro-active decarbonization-agenda is part of the fiduciary duty of the board and ensures that a given real estate portfolio is future-proof and not unduly exposed to severe write-downs.

Green Governance and Climate Transition Plans: The development and implementation of a climate transition plan and its respective disclosure will help stakeholders assess whether a company has an effective strategy to deliver its short-, medium-, or long-term climate-related targets. Implementation must start with the right tone being given from the top and must ensure executive support for all necessary implementation steps. However, not every investor, asset manager or region globally is the same: as decarbonization in general, and Net Zero by 2050 in particular, are commitments that have a significant impact on the company, it is essential to ensure a corporate fit. Green Governance and deriving a sound transition plan is a holistic approach consisting of 7 steps illustrated in detail in the framework developed in this report: Status Quo, Setting Targets, Setting Strategies, Adjusting Organizational Structure, Operational Measures, and Monitoring & Reporting.

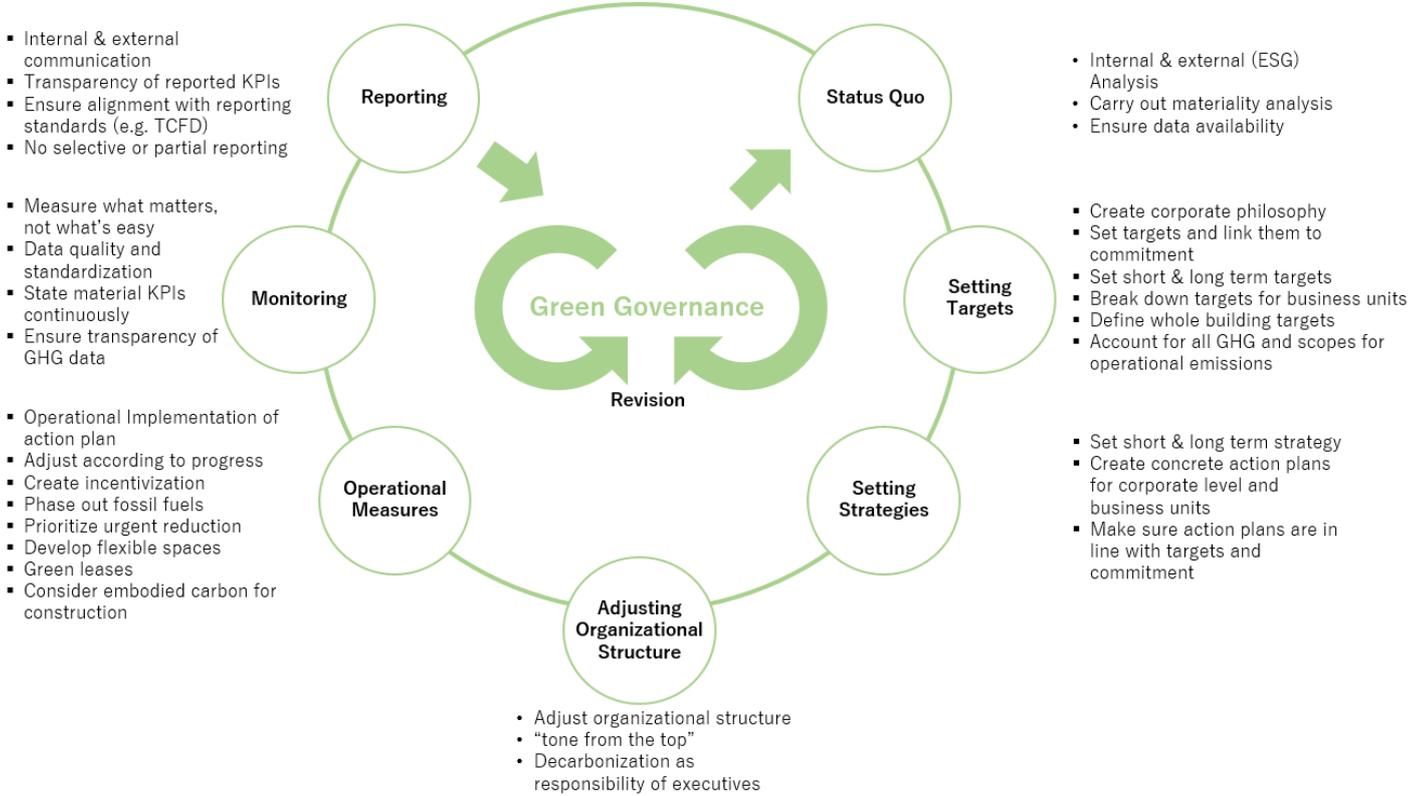


Figure 1 Green Governance Framework (own illustration)

From ESG 1.0 to ESG 3.0: It is no longer sufficient for a company to be perceived as being committed to sustainability when only a few assets boast green labels and a fulltime employee (FTE) subsequently produces nicely put-together marketing slides heralding this accomplishment. ESG 3.0 requires a holistic view and a broad set of measures. The main key recommendations drawn from the identified pitfalls include:

- Waiting for regulation is not a future-oriented strategy.
- Materiality analysis and disclosure of sound transition plans are essential starting points.
- Relevant framework and organizations/initiatives supporting decarbonization have to be better understood by the market participants.
- Valid and reliable information/data sources about the status quo are key before making any Net Zero-pledge.
- Measurement of carbon intensities matures, and investment in software solutions are taking place.
- 'Tone from the top' is required to steer a company towards Net Zero.
- Disregarding Scope 3 emissions is not an option.
- Defining granular goals and milestones is evolving. Setting even targets for renewable energy production on-site and other KPIs are important.
- Missing automated data management can endanger commitments.
- (Internal) carbon pricing must be acknowledged by the executives to justify capital expenditure (CapEx) planning enabling efficient budgeting for the transition plans.
- (External) verification of targets and detailed roadmaps is required to avoid greenwashing.
- Low carbon construction and fundamental changes for applied construction material must be ensured.
- Decarbonization targets have to be related to remuneration for executives and employees.
- Decarbonization decisions should be based on whole life carbon (operational, fugitive, embodied etc.).

2. Outline and Approach



2. Outline and Approach

Despite concerted efforts to limit global warming to the Paris Accord-aligned threshold, 2023 proved to be yet another year of overshoot. Tangible progress fell significantly short of the necessary annual greenhouse gas (GHG) emissions reductions.

Another Year of Overshoot

This failure resulted in another set of grim climate milestones, with 86 days in 2023 surpassing temperatures 1.5°C above pre-industrial levels. In addition, instead of the absolute reductions required, emissions increased by a worrying 1.2% over the previous year (UN 2023, EEA 2024). Scientists warn that while sufficient mitigation continues to fail, we are entering uncharted territory with climate tipping points (CTP) and social unrest becoming more likely. As public investment, financing, and planning for climate adaptation remain unsuccessful, the world finds itself increasingly exposed to climate-related risks.

More Robust Measures are Required to Mitigate Climate Risk

Consequently, there is an urgent imperative for corporations to adopt more robust measures to address and confront these risks head-on (Ripple et. al 2023, McKay et. al 2022).

As the ‘race to Net Zero’ gains momentum on a global scale, not only are countries, regions, and cities voluntarily committing to Net Zero pledges, more and more companies are as well. Currently, the majority of global multi-asset investors are already making commitments in various forms in regards to their sustainability and the ESG (Environmental, Social, and Governance) agenda. Typically, these Net Zero targets are publicly announced as being somehow ‘Paris-proof’.

Net Zero Commitments are Becoming More Popular

It has often been stressed that real estate undoubtedly plays a pivotal role in the process of decarbonization – with a sector contribution of nearly 40% of all CO₂ emissions globally (CRREM, UNEPFI 2022). In contrast to major multinational investors, there is still a notable contingent of real estate market participants who have as yet not voluntarily committed to Net Zero initiatives. In addition, greenwashing is prevalent in the real estate sector, particularly evident when looking at the gap between the commitments made and the savings achieved by the industry. There is a real risk that our industry is underestimating the magnitude of challenges facing us and the transformations that are necessary to overcome them. Consequently, there is an urgent need to formulate a clearer and more effective approach to organizing and implementing the sustainability agenda within our companies.

Disparities in Transparency and Integrity of Climate Transition Plans

With an increasing number of companies setting some sort of a decarbonization target and branding themselves as ‘climate leaders’, it is crucial to recognize the significant disparities in the transparency and integrity of climate transition plans among real estate investors. A climate transition plan is a strategic roadmap with defined timelines that articulates how an organization intends to realign its current assets, operations, and overall business framework to adhere to the most up-to-date and ambitious recommendations from climate science (CDP 2023). The robustness and traceability of these plans will be challenged more intensively going forward – stressing the need for a clear and reliable framework.

Current Climate Claims Often Misleading

Findings from the ‘Corporate Climate Responsibility Monitor’, ‘CDP’ (Carbon Disclosure Project), among many others confirm that the majority of companies’ current climate claims, pledges or future Net Zero goals are exaggerated, partially false, lacking sufficient comprehensiveness, and to some extent misleading and not in line with the day-to-day business activities. In simpler terms: Targets, commitments, and pledges of the companies may appear similar at first glance, but their actual quality can vary significantly. In focusing on decarbonizing the built environment as our primary mission, we have also observed an increasing prevalence of greenwashing issues. This highlights the urgent necessity for a well-defined agenda and robust ‘Green Governance’ to guarantee that commitments and pledges be effectively fulfilled.

Once more, we stress the critical importance of the tone-from-the-top principle, emphasizing corporate governance and comprehensive long-term planning as indispensable for achieving any kind of ambitious targets. This report underscores the necessity of immediate action to harness the climate leadership potential within the real estate sector, as it will play a pivotal role in driving the necessary climate actions toward complete decarbonization by 2050. In view of these general observations this report clarifies:

- How the corporate perspective of the real estate sector intersects with the global challenges we currently face (Chapter 3).
- Why going beyond regulatory requirements and committing to Net Zero is a sound business decision (Chapter 4).
- What opportunities accompany the implementation of Net Zero initiatives (Chapter 5).
- How Net Zero and Green Governance can be defined and how they relate to structured transitions plans for a successful implementation (Chapter 6).
- What components constitute a comprehensive Net Zero transition plan, and why adopting a holistic approach is essential (Chapter 7).
- Real life best-practice case studies from leading real estate companies, each highlighting specific measures of the implementation of a transition plan (Chapter 7).
- An overview of relevant tools, initiatives and standards accompanying the implementation of an transition plan.

Our developed Green Governance framework will support the successful implementation of Net Zero Commitments within real estate companies. We describe measures for each of the main steps of our framework:

- Identifying the status quo
- Setting targets
- Deriving strategies
- Adjusting the organizational structure
- Introducing operational measures
- Measuring and monitoring progress
- Creating robust reporting structures

Our findings are drawn from over 25 comprehensive interviews conducted with ESG leaders or board members from major real estate investors. Additionally, our research involved analyzing public statements from a variety of real estate companies. These statements were evaluated against the theoretical framework that we developed, based on more than 20 publications advocating for best practices in Net Zero and transition plans.

The analysis reveals that while a large proportion of market participants is setting targets, only a few have already put in place a well-balanced and holistic transition plan and governance framework. For many companies, the required measures have not yet been implemented, exposing market participants to greenwashing and litigation risk. This report is intended to help real estate companies create and implement feasible Net Zero Transition Plans. Furthermore we have included several best practice cases from industry leaders.

The development of this Green Governance framework has been carried out in multiple stages with the combined expertise of our partners EPRA and UNEP FI, and the CRREM team. The resulting document represents a concerted effort to help all actors along the value chain. We would like to thank everyone involved for participating in this process!

For our own self-assessment, we also developed an Excel-based tool to support the implementation process of our green governance framework. This tool allows users to identify the current action gap as well as the overall progress of the implementation.

3. Global Race to Net Zero: The Corporate Perspective



3. Global Race to Net Zero: The Corporate Perspective

Climate Change and Climate Action Failure

Anthropogenic greenhouse gas emissions (GHG)¹ have led to serious consequences for plants, animals, humans, and nature as a whole. Extreme weather events are becoming more common, and affecting regions which were previously spared from natural disasters (IPCC 2021). The physical changes to the environment can no longer be overlooked or ignored. Due to uncontrolled GHG emissions in the past, the Earth has presently already warmed by more than 1°C since the pre-industrial era. According to the IPCC (Intergovernmental Panel on Climate Change) 2021, a further temperature increase of 3° to 4°C cannot be ruled out under a business as usual (BAU) scenario, a situation which would likely see climate tipping points to being reached. With the lethal risk of anthropogenic climate change becoming so apparent, the World Economic Forum (WEF 2022), has placed climate action failure at the top of its annual global risk report, where it still remains in 2024 alongside extreme weather events. Global warming not only influences extreme weather events, it also fundamentally endangers public health. According to the 'Lancet Countdown 2023', the danger to vulnerable populations (adults older than 65 and children younger than one year of age) is drastically increasing, leading to 85 % more heat-related deaths in 2018-2023 compared to 2000-2004. Furthermore, increased temperatures are starting to noticeably affect our economy. The report further states that approximately 490 billion potential labor hours were lost due to the extreme heat in 2021 with an associated income loss of US\$ 863 billion in total (Lancet 2023).

Risk and Pressure for Change Cannot Be Overlooked Anymore

Today 'only' 0.8% of the Earth's surface has a mean annual temperature of 29°C or higher. In a BAU scenario, this could increase to 19 % by 2070, potentially affecting approximately 3 billion people (Xu et al. 2020). The escalation of physical climate risks directly correlates with the increase in global temperatures.

In order to limit global warming, signatories of the Paris Agreement, agreed to target a maximum average temperature increase of 1,5°C compared to pre-industrial levels

1 GHGs include CO₂, methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆), and nitrogen trifluoride (NF₃)

(UNFCCC 2015). In order to achieve this ambitious goal, the economy, consumption, and all other human activity will have to be largely decarbonized by 2050 (IPCC 2018).

Failure by the real estate sector to limit its emissions in line with a 1.5-degree threshold will inevitably entrain reverberations across all properties, manifesting itself in increased instances of severe weather events and subsequent losses (McKinsey 2020).

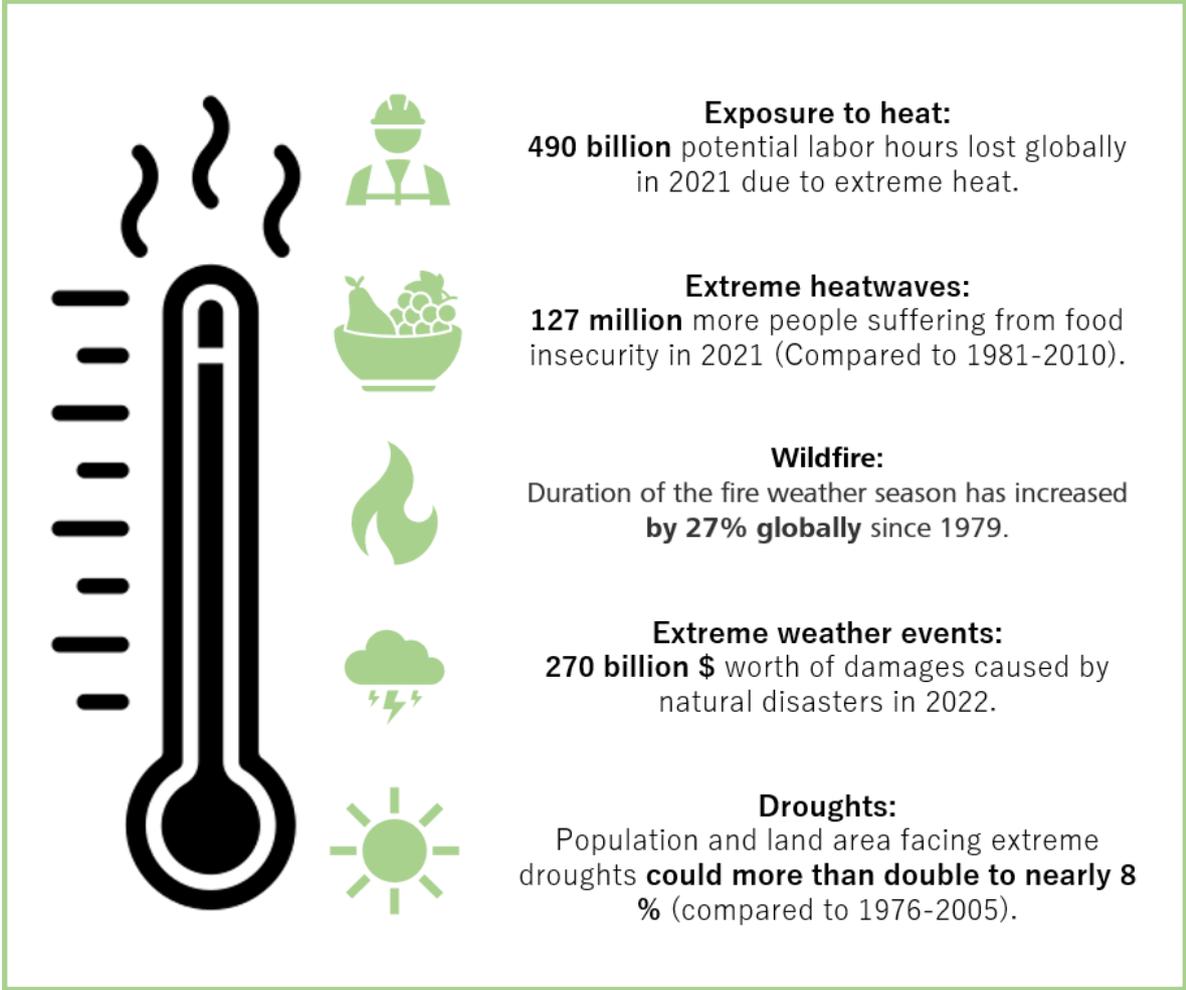


Figure 2 Consequences of climate change in numbers (own illustration - based on Lancet 2023; MunichRe 2023; World Bank 2023, OECD 2023)

Decarbonization and Net Zero Targets

Decarbonization is often referred to as Net Zero, i.e. GHG emissions are cut to as close to zero as possible, with any remaining emissions re-absorbed by the atmosphere, oceans, or forests (UN Net Zero Coalition 2024). It is critical to note that real operational savings are at the core of every Net Zero strategy – carbon offsets should only be used for emissions which cannot be eliminated by any other means. For real estate, this translates to various definitions on the company level and even more so on the asset level.

Absolute zero	When no greenhouse gas emissions are attributable to an actor’s activities across all scopes. (UNFCCC 2024)
Net Zero whole-life carbon building	‘A building where the sum total of all building-related greenhouse gas emissions over a building’s life cycle, both operational and embodied, is minimized; meets local carbon, energy and water targets; and, with residual offsets, equals zero.’ (WLCN 2021)
Net Zero carbon operational energy building	‘A ‘Net Zero Carbon – Operational Energy’ asset is one where no fossil fuels are used, all energy use has been minimized, meets the local energy use target (e.g., kWh/m ² /a) and all energy use is generated on- or off- site using renewables that demonstrate additionality. Any residual direct or indirect emissions from energy generation and distribution are ‘offset.’ (WLCN 2021)
Nearly zero emission building (NZEB)	‘Nearly zero-emission building (NZEB) means a building that has a very high energy performance, while the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.’ (European Commission 2024)
Zero carbon ready building	‘A zero – carbon – ready building is highly energy-efficient and either uses renewable energy directly, or uses an energy supply (e.g. electricity or district heating) that will be fully decarbonized by 2050.’ (IEA 2022)

While Net Zero itself is a term typically related to targets set for 2040 or 2050, we note that some current activities engaged in by companies disqualify any market participants who state that they are targeting Net Zero.

Pre-requisites for Net Zero in the Real Estate Sector

These incompatible aspects for the real estate industry include:

- Investments in fossil fuel-related technical equipment (e.g., new oil or gas heating).
- Development requiring significant deforestation.
- Reliance on carbon credits as a first or main step to decarbonize.
- Excluding Scope 3 emissions/tenant space when claiming to decarbonize their portfolio.
- Supporting trade associations which undermine or neglect ambitious decarbonization targets.
- Pledges not including the entire company.

To enforce the Paris Agreement on a national level, regulation must be gradually adjusted through the Nationally Determined Contributions (NDCs). Every 5 years, each country's NDCs, must be submitted to the UNFCCC Secretary, with successively and increasingly ambitious and detailed plans on how countries intend to meet the limits set by the Paris Agreement. To comply with their NDCs national regulations such as CO₂-taxes, energy performance requirements, GHG-Budgets, or sector specific measures are introduced, going as far as shutting down certain industries (e.g., coal mining). During recent years, the pace of tightening the regulatory framework has increased drastically in all global regions ([Worldbank 2023](#)), such that today, over 91 % of the global GDP (amounting to 83 % of the worlds GHG emissions) is captured by governmental Net Zero targets ([Net Zero Tracker 2022](#)). Given these overwhelming changes it is somewhat surprising that many companies have not yet responded appropriately to this new business environment. According to a recent report, companies in the G7 only announce targets which would be sufficient for a global warming of 2.7°C ([CDP 2022](#)). Other sources confirm similar discrepancies, with a forecasted global warming of 2.7°C, when taking into account actions and policies already introduced and 2.1°C if all binding pledges were to be successfully implemented ([Climate Action Tracker 2023](#)).

Regulation Is Increasing Drastically

The real estate industry constantly finds itself in the spotlight of the decarbonization debate. Besides having a massive absolute share of all emissions, real estate is often perceived as a sector with a high share of low-hanging fruits in the political discussion meaning that the cost-benefit ratio to save one metric ton of CO₂ is potentially more favorable compared to other sectors (so called abatement-costs²). However, some empirical studies indicate an overestimation of the cost-benefit relationship in certain cases ([GdW 2020](#)). Given the industry's significant impact combined with favorable abatement costs, it comes as no surprise that policymakers are tightening the regulatory framework to cut GHG emissions and limit energy consumption. The new US Net Zero building definition proposed by the White House, the updated Energy Performance of

2 Cost of securing a reduction in pollution ([Oxford 2024](#)).

Buildings Directive (EPBD) in the EU, and the newly introduced sustainability taxonomies in Singapore are just three prominent examples of the constant wave of regulations that the real estate sector now finds itself facing. Another prominent example is China's new ESG disclosure requirements for its largest companies.

**High Emissions Coupled with Cost-Effective Abatement:
Real Estate at the Center of Regulators' Attention**

Besides the clear call to intensify mitigation efforts, the sector also finds itself largely affected by the negative consequences of climate change. These include valuation adjustments/write downs, lower liquidity, increasing challenges in obtaining insurance coverage, and more restrictive financing conditions (UNEPFI 2021). A growing regulatory pressure, coupled with more severe extreme weather events, the increasing awareness of investors that entrains a rising risk of stranding assets ; all of these factors mean that any successful implementation of decarbonization targets aligned with Net Zero targets is thus a useful approach to safeguarding any company's business model (UNEPFI, CRREM 2022). 'Climate-related risks' become pertinent for investors when the conditions, events, or circumstances they entail could adversely affect their asset values. Additionally, scrutinizing established practices, methods, and offerings can lead to the development of new products, thereby improving the competitive position. We note that holistic and proactive actions are required, underpinned by a profound understanding of the companies' status quo in order to successfully implement a Net Zero target.

4. Why not Wait until
Forced to Act? – Risks and
Opportunities Related to
Net Zero Strategies



4. Why not Wait until Forced to Act? – Risks and Opportunities Related to Net Zero Strategies

Real estate companies have to take a fundamental strategic decision regarding decarbonization and their contribution to mitigate GHG emissions: They can be pro-active and, anticipate foreseeable changes, or they can wait until forced to act due to a changing regulatory environment.

Waiting for regulations to enforce the emissions cuts might be tempting at first sight. Companies are given precise benchmarks they have to comply with, ensuring that they are not spending what to them must seem an inordinate amount of money as a result of ambitious voluntary commitments. This (passive) strategy essentially means that investors would only retrofit buildings when new standards are introduced, would not increase energy efficiency unless forced to do so, and would not commit to (voluntary) climate protection targets.

Lagging Behind and 'Wait and See' Are not an Option

However, there are significant downsides to this approach for real estate investors at the asset, portfolio and company levels. If regulation does change and enforces steadily higher standards on properties, the market will eventually devalue assets not meeting a certain required efficiency level. Laggards might be left with the worst-performing assets and face massive write-downs and extremely high adaptation costs since they would have failed to align with the required (efficiency) measures within the normal CapEx cycle.

Also the portfolio and company level, there are convincing arguments to recommend a strategy favoring a more aggressive decarbonization agenda in order to avoid transition risks:

1. The risk of having stranded assets in the portfolio rises with every new change in regulation (declining markets' attractiveness compared to peers, rising yields, and lower property values for inefficient assets, increasing funding costs for debt due to risk premiums the banking sector faces, lower liquidity due to lower tenant and investor demand for such assets).

2. Investors might lose interest in the assets offered or in the company as a whole because of higher market-driven standards on grounds of the sector's sustainability performance.
3. The capital costs of the company could escalate because of an increased perceived risk.
4. The competitive position of the company is at risk, as investors, tenants, and employees become increasingly demanding with respect to the ESG agenda and the credentials of their counterparts.
5. Adapting to the new energy standards of the built environment could become more expensive if companies are ill-prepared and thus have to procure materials and services on an ad hoc basis.
6. Companies might not have the right skills and trained employees once regulation changes.
7. Reputational damage might occur since the company could be perceived as a laggard in the industry (not reacting quickly and sufficiently enough to obvious changes).
8. Tenants may opt for alternative rental properties which promise lower energy costs and stronger ESG credentials.
9. The operational performance of these companies and properties could be inadequate simply because they lack sufficiently analyzed ESG-related quantitative data to effectively guide their portfolio performance.
10. Major (investor-related and other) sector initiatives collectively urge corporates to disclose more and better information concerning the impact climate change is having or is likely to have on their financial performance.

Fiduciary Duty and Ensuring a Future-Proof Business Case

All of these reasons underpin the need for a sound, pro-active and well-prepared Net Zero-agenda and have nothing to do with altruism: They are part of the fiduciary duty of real estate leaders to protect the capital of their shareholders and ensure a reliable, future-oriented positioning of their company within the sector.³ Climate change is, in contrast to many other business risks, extremely difficult to manage. As it is for any other sector, real estate investments are expected to deliver sufficient financial performance to their shareholders on a yearly basis. In contrast to these short-term requirements, climate change presents long-term challenges which extend beyond typical quarterly performance measurement and business planning cycles. This phenomenon was termed the 'Tragedy of the Horizon' by Bank of England Governor Mark Carney ([Bank of England 2015](#)).

3 also see Evora (2023): Fiduciary Duty in 2023

Pro-Active Management of Transitional Risk is the Key

A forward-oriented approach that entails a Net Zero commitment and well defined measures to enhance efficiencies will effectively avoid transition risk and ensure that stakeholder expectations are met. The challenges resulting from these risks will be discussed in more detail in [Chapter 5](#).

Urgency Still Ignored by (Too) Many Market Participants

The majority of our interviewees have noticed a significant strategic shift over the past few years that has impacted the way their companies buy, sell, and manage real estate (particularly driven by the need to conserve resources and decarbonize). However, not everyone in the industry recognizes the need to have Net Zero emissions as their target. According to recent studies, only 10% of the investigated real estate companies listed globally have an externally verified Net Zero commitment of Scope 1–3 emissions⁴. Even worse: a staggering 60% of the companies surveyed have not committed to any GHG reduction target whatsoever ([Van Lanschot Kempen 2022](#)). In light of these results, there is a clear need for real estate leaders to acknowledge their broader responsibility regarding decarbonization and to understand to which extent their own climate risk potentially already endangers their well-established business case.

Not Everyone Is the Same – Targets and Implementation Must Have Corporate Fit

Nevertheless, an unreflective and unstructured commitment to Net Zero emissions targets does not make sense. Some market participants underestimate the operational challenges and changes required to not just commit to but to also eventually achieve these goals. This problem is not exclusive to the real estate industry. Recent studies suggest that a significant portion of companies that pledge to achieve Net Zero emissions are failing to implement the changes necessary to meet their stated goals ([Carbon Market Watch 2023](#)). Other prevalent examples are the recent SBTi commitment ‘removals’ ([SBTi 2024](#)).

Especially in an environment rife with rising interest rates where most global real estate markets are experiencing a downturn, it becomes increasingly difficult for executives to justify CapEx and other climate-related expenditures. While many CEOs understand that ESG is important, 59% want to pause or reconsider their strategy in the light of an approaching recession ([KPMG 2022](#)). This highlights the need for any decarbonization target to be aligned with specific macroeconomic conditions, organizational financial capacity, and overall corporate strategy over time. Especially for pure fund or asset managers dealing with separate accounts, the level of ambition for decarbonization also depends on the fund type, region and theme (core, ESG, Article 8 or 9 of the EU Regulation, etc.) and is typically not within their own decision-making power, but rather depends on the intentions of the respective investor. We will highlight these different starting positions in [Chapter 6](#).

4 Explanation of Scopes: GRESB, PCAF, CRREM (2023): Accounting and Reporting of GHG Emissions from Real Estate Operations Technical Guidance for the Financial Industry pg. 59

Creating New 'Green' Business Opportunities

The transition to Net Zero does not only require significant investments and resource commitments, it also opens up many new opportunities.

Our respondents confirmed that challenging the way business is done today also paves the way for greater innovation and competitive advantage through new services and products. Asset managers could potentially specialize in the energetic retrofitting of seemingly stranded properties. Developers could promote brownfield developments and redevelopments focusing on low carbon construction, or IT companies and data providers might offer new ESG software-solutions. Other green business models could include solutions for reducing and tracking emissions, on site services (e.g. vehicle charging, green facility management etc.), and local energy generation and storage (McKinsey 2022). Some market participants already view properties with suitable space potential (large-scale retail or logistics) as future power plants. According to investors who have already been involved in sustainability for a long time, ESG has become central to their business strategy, is now embedded in all functions of the company, and forms part of the mindset of their employees: as one investor said, 'It's a big shift to fully understand the fundamental implications for our business case, rather than just trying to keep up with regulation'.

Net Zero Commitments Are Rewarded by the Capital Market

Sustainability, ESG and decarbonized assets have experienced a sharp increase in demand in recent years. 73% of leading Investors (JLL 2021) strongly agree that green strategies can drive higher occupancy, higher rents, higher tenant retention and an overall higher value. This perception is supported by empirical research which suggests that 'green premiums' exist for both real estate rental and sales prices (Dalton, Fürst 2018; Wilkinson, Sayce 2020; UBS 2023). Cross-sectoral research results furthermore confirmed that companies committing to Net Zero targets had not even experience any short-term penalization by capital markets (as one might expect due to high short-term capital expenditures). Similar results were found in a recent study highlighting favorable financing conditions for green buildings compared to their non-green counterparts (Gloria et. al 2024). In addition numerous studies demonstrate that climate leaders are in general more likely, to gain a competitive advantage (WEF 2022).

Regulators of the financial sector such as BaFin (Germany), FMA (Austria), or the Federal Reserve Board (US) are increasingly mandating that the banking and broader financial sector incorporate climate risk into its risk assessment, eventually including also loan conditions and risk premiums/ interest rates. Many of our interviewees said that the pressure to work hard on ESG issues is increasingly coming from the banks that finance assets.⁵ Banks are becoming more demanding in terms of ESG data requirements from their clients.⁶ For real estate investors seeking to receive bank financing, this means that more granular ESG related data must be provided to banks. Ultimately, lower-energy

5 e.g. the basel committee BIS (2023).

6 For more information see DVFA (2023).

properties that meet Net Zero requirements in a timely manner will be able to secure better credit terms and lower-cost loans.

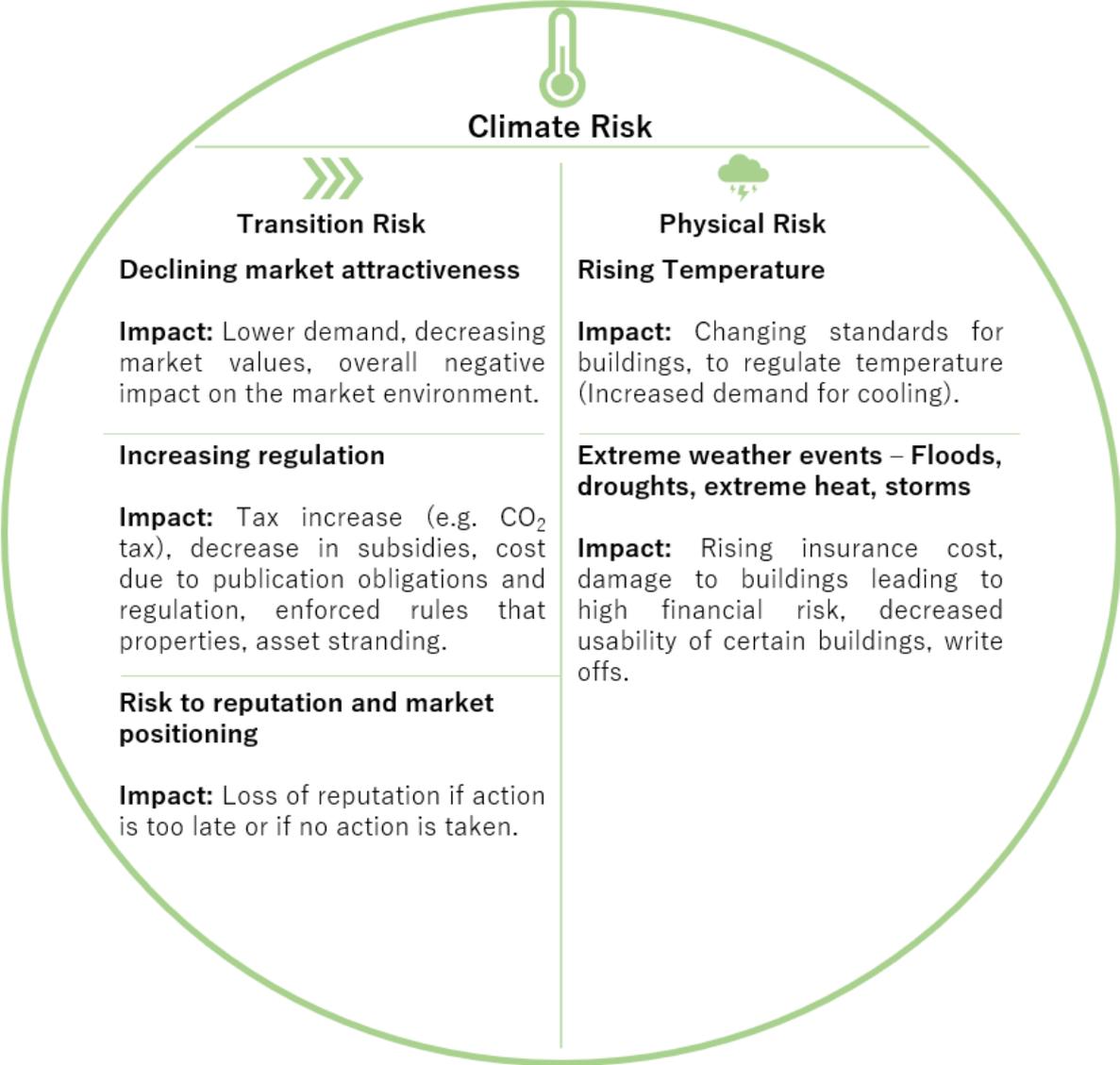


Figure 3 Transition Risk vs. Physical Risk (Own illustration)

5. Sector Challenges Impacting the Framework



5. Sector Challenges Impacting the Framework

Transitioning one's own business model into a completely decarbonized society will ultimately strengthen the company, but it poses a challenge especially for market participants with large portfolios of already existing properties.

In this section, these challenges will be discussed in order to gain a better understanding of what is hindering the industry from fully committing to Net Zero targets. These challenges can also be viewed as potential pitfalls to be avoided when formulating a successful Green Governance framework and sound transition plan. The challenges were formulated based on the information obtained from the interviews conducted with industry leaders, and refined by analyzing a vast amount of business approaches that aim to mitigate emissions in our sector.

5.1 Mind the Gap – Commitments Require Corresponding Measures

At first glance, it might seem that the real estate industry is aware of the substantial efforts entailed in decarbonization. 93% of market participants consider ESG to be the most critical factor for a successful transformation of the company ([PWC 2024](#)).

Achieving Net Zero is a Marathon, not a Sprint

While an increasing number of companies are considering long-term Net Zero targets, many studies confirm that a lack of interim-targets and milestones still exists ([MSCI 2022](#)). In general, our takeaway from many of the interviews was that targets are becoming more granular. Respondents indicated that they are now setting specific goals across functions/departments or even for individual employees. Goals are also becoming more differentiated over time, with more milestones to ensure countermeasures in case of deviations.

Define Interim Targets and Milestones

If, for example, an asset management company commits to Net Zero by 2050, but their efforts at decarbonization are only tracked once a year, without establishment of any disciplinary consequences for failing to meet the target nor introduction of short-term milestones to be reached, then the organization will most likely be unable to comply with their long-term commitment. Similarly, a real estate developer, who focuses on new construction with conventional building materials rather than brownfield-redevelopment and/or alternative recycled material, will ultimately not be in the position to comply with any ambitious commitments. Both examples illustrate that the changes and measures resulting from such a commitment and the set of skills required for the commitment's proper implementation, are often insufficiently understood. Additionally, we observed that many real estate companies still do not allocate a specific financial budget to the required activities.

Any apparent discrepancy between Net Zero carbon commitments and the actions taken can be referred to as the 'green action gap'⁷. As the ambition level required to comply with a 1.5°C pathway has been steadily increasing over time (CRREM 2022), this gap also continuously changes and is likely to grow over time (BPIE 2022).

Avoid Insufficient Measures to Reach Self-Declared Decarbonization Targets

According to a recent CDP assessment, less than 5% of European companies with transition plans ostensibly aligned to the 1.5°C limit show advanced transition readiness when analyzed with the CDP transition indicators (CDP 2023). This again stresses the large discrepancy between the perceived and actual implementation of required measures.

5.2 Greenwashing – Once Regarded as a Trivial Offense, Today Legal Consequences Loom

With countries, regions, cities, and financial institutions announcing ambitious Net Zero targets, the real estate industry is increasingly exposed to strategies, needs, and activities of these stakeholders. The expectations, requirements and resulting pressure of these market participants and the broader public is gradually shifting towards more sustainable, decarbonized, and 'ESG-positive' products, services, and assets. We note that some market participants frequently present their buildings as more sustainable than they actually are, capitalizing and freeriding on increased demand and willingness

7 Implementation difference between action taken and action required to fulfil Net Zero commitment and actual action to achieve the goal.

to pay for such assets. In addition to violating business ethics, the parties involved are often unaware that they are exposing their own companies to significant litigation risks as a result of greenwashing.

The US SEC defines greenwashing as the ‘act of exaggerating the extent to which products or services take into account environmental and sustainability factors’. ‘Greenwashing’ in real estate refers to sustainability-related information which misleads potential stakeholders, especially tenants and investors, by not clearly and honestly reflecting the sustainability profile of a company, financial product, or individual asset. To counteract this phenomenon, increased transparency and clear guidelines for presenting specific data, such as those emerging in Europe from the SFDR or the CSRD, are being implemented.

Green-Market Premiums – Incentives for Freeloaders?

Sustainable real estate funds and companies have been proven to have substantially better performance characteristics than their ‘non-green’ peers (MSCI 2023, Nareit 2023). At the same time, the demand for sustainable real estate is growing among both investors and tenants. Consequently, properties and portfolios with more ‘green-credentials’ clearly showcase superior financial performance compared to conventional assets (Dalton, Fürst 2018, Bienert 2016, LaSalle 2023).

In principle, there is nothing wrong with communicating superior sustainable characteristics in marketing campaigns. Ultimately, this will also support the necessary market shift towards decarbonized assets. However, some real estate market participants still dishonestly exploit the higher demand and potential pricing premiums for sustainable products. These actors try to sell conventional assets with a ‘green’ marketing campaign, knowing that not a dime was spent on optimizing their environmental performance.

Greenwashing is no Longer a Minor Offense in Business.

Although the research and empirical evidence are unequivocally clear that greenwashing is not lucrative (Berrone et. al, 2017, Walker et. al 2012), too many real estate professionals still underestimate the risk and consequences of being exposed. We discuss four reasons that should inhibit market participants from continuing to move in this harmful direction.

Today’s Markets Know What Sustainability Is – and What It Is Not (I.)

The initial argument stems from the fact that many of the recently introduced regulatory requirements and voluntary frameworks directly address ESG quantification, including precise specifications for GHG measurement. As a result, in stark contrast to the situation 10 years ago, today’s ‘ESG-positive’ products and services are clearly defined – there is little room for creating subjective or self-defined sustainability concepts. Recent developments suggest that more authorities around the globe show a growing interest in preventing questionable actions (e.g., EU SFDR & Taxonomy). Clear definitions and

requirements regarding KPIs are introduced to identify misconduct. As a consequence definitions of associations and standard setters are becoming more precise in measuring energy consumption and GHG emissions, as well as reporting them ([GRESB, PCAF, CRREM 2023](#)). The space for subjective interpretation, greenwashing, or potentially claiming a lack of knowledge when caught in a case of violation is decreasing.

Stakeholders and NGOs Pressure Leads to Scrutinizing the Results (II.)

Greenwashing could lead to a fundamental loss of sales, harm the company's reputation, trigger legal consequences and ultimately cause a decline in market share ([DeJong 2020](#)).

Growing public awareness and involvement of professional market participants is increasing the risk for companies which violate regulations. Non-compliant companies' risk being labeled as 'black sheep' and losing their foothold in the industry.

The danger of greenwashing affecting a company's performance is of both internal and external nature. Internal pressure comes especially from younger employees as they tend to value sustainability more than older generations ([Yale 2022](#)). With a growing shortage of qualified workforce, it is questionable whether companies can afford to lose employees by neglecting sustainability. Externally, stakeholders, such as investment analysts, financial institutions and the broader public, increasingly demand clarity on the measures taken to reduce climate risk and related KPIs communicated to the market. Transparency, as well as valid and reliable data, is therefore essential to ensure the confidence of the capital markets.

Accusations of greenwashing against companies have been increasingly common in recent years, with notable examples such as the DWS greenwashing scandal. DWS Investment Management Americas was reported to have made 'concerning' false statements regarding its ESG investment process, as stated by the U.S. Securities and Exchange Commission (SEC). In Germany, regulators have been investigating allegations, prompted by a whistleblower, suggesting that DWS may have misled investors by promoting its funds as more environmentally friendly than they actually were ([Financial Times 2023](#)). As a result, the CEO Mr. Wöhrmann resigned.

Another astonishing example is a real estate company we analyzed while committing to Science Based Target initiatives (SBTi) aligned Net Zero targets, the executives were still using private jets on a frequent basis. It is at least questionable whether the right mindset is in place to ensure sufficient action to decarbonize the entire enterprise.

Lawsuits and Regulations are Increasing Significantly Across the Industry (III.)

Just as deliberately false balance sheet disclosures or other misleading financial statements can lead to legal consequences, inaccurate sustainability disclosures can also result in criminal proceedings. The increasing demand for ESG-related services and products, coupled with rapidly evolving regulatory regimes, has created a context that is likely to foster increased risks of greenwashing. Litigation and lawsuits to enforce consumer protection laws against greenwashing are becoming more common ([Euroactiv 2022](#); [Ciel 2022](#)).

External assessments and methods for evaluating the integrity of transition plans, and uncovering greenwashing, are on the rise ([Bingler et al. 2023](#)). Consequently, we note that litigation risk, deemed a relevant financial risk, is increasingly leading real estate companies to face accountability in courts for the adverse impacts of climate change, and prosecutions are beginning. Studies have already isolated the negative effect of such filings. Following an unfavorable judgment, defending company values can decrease by up to minus 1.50% ([Sato et al. 2023](#)).

On March 22, 2023, the European Commission (EC) released the draft guidelines on environmental disclosures ('Green Claims Guidelines') with the aim of combating greenwashing and empowering consumers to make informed purchasing decisions grounded in reliable environmental information about the products they purchase ([European Commission 2023](#)). In light of such laws, supervisors such as the European Supervisory Authorities (ESAs) will play an increasingly vital role in identifying, preventing, investigating, sanctioning, and remedying instances of greenwashing.

Stakeholders Ask for Assured and Transparent Data on Decarbonization (IV.)

Many companies have committed to reduce GHG emissions or even achieve 'Net Zero' status by a specific date. They may make these pledges to attract new investors, appeal to stakeholders who prioritize ambitious ESG credentials, or stay ahead of regulatory developments and reduce risk exposure. In response to these commitments, stakeholders are demanding more granular and traceable KPIs which showcase the achievements and milestones of climate-related targets. Only if the targets are credible and the companies' statements comparable will they be taken into account in investment or divestment decisions.

Even though an increasing number of companies have emissions reduction targets, but only few disclose details (6%). In line with this finding, credible or validated targets by SBTi are often missing ([CDP 2022](#)), and /or a stated target for emissions reduction is simply not underpinned by sufficient plans/measures ([Carbon Market Watch 2023](#)). CDP notes that, while almost 1/3 of the reporting entities have transitions plans, merely a fraction of them (1%) reported on all 24 key indicators ([CDP 2022](#)). This is to some extent surprising since sustainability reporting guidelines have already been established for many years. One of the pioneering guidelines, the EPRA Sustainability Best Practice

Recommendations (sBPR)⁸, were published in their first version in 2011. Tailored to the listed real estate sector and addressing sustainability concerns with ESG indicators (including Scope 1, 2 and 3 emissions), the market driven guidelines provided an early indication of the direction the industry had to take.

According to many of the respondents we interviewed, the clear message is that assured/certified data is clearly on the rise.

Unintentional Greenwashing Is Still Greenwashing

Of course, there are also cases where greenwashing is occurring unintentionally. This can happen when companies lack the competence and knowledge in reporting their sustainability measures, or simply because of strategies which are not in line with the defined goals. This inadequate presentation of strategies, targets, and procedures in reporting may harm the company in the long run. For instance, companies which claim to decarbonize their real estate portfolio along the entire value-chain, but in fact only track and reduce Scope 1 and 2 emissions, showcase an obvious discrepancy between the communicated intentions and the actions taken. The missing tenant-related emissions in their approach will prevent the portfolio from being fully decarbonized.

It is obvious that regulation to combat greenwashing attempts will become stricter in the short term ([Carbon Market Watch 2023](#)). In order to avoid falling into the greenwashing-trap, we urge real estate investors to follow our implementation framework (see [Chapter 7](#)). We emphasize that the following aspects need to be addressed:

- absolute and relative emissions reduction in line with 1,5-degree science,
- align operational measures and activities and CapEx planning to these targets and ensure that only a residuum is possibly covered via carbon offsets etc.,
- make sure communicated results and possible deviations are transparent, valid and reliable,
- account for all (direct and indirect) emissions and the full-value chain.

5.3 Being Ahead of the Curve – Wave of Regulations

The Paris Agreement has led to a global flood of regulations to reduce GHG emissions and foster sustainability. Market participants who speculate on a business-as-usual approach were thrown in at the deep end. Regardless of the success of limiting global warming to 1.5°C, it is already foreseeable that new regulation, taxes, prohibitions, and other instruments will be introduced by governments to accelerate the economy's decarbonization.

8 The 4th edition of sBPR Guidelines will be published in Q2 2024. It will provide bridge requirements between EPRA sBPR KPIs and the sector agnostic ESRS.



Figure 4 Local Building Performance Standards USA
(based on Office of Energy Efficiency & Renewable Energy 2023)

Rising Interest Rates: Internal ESG-Activities are not Losing Traction

There was an overwhelming consensus among the investors we spoke to that while a market environment of higher interest rates and economic recession in some parts of the world makes the ESG case more difficult, they believe that the pressures from climate change and regulatory efforts will increase over time. Therefore, internal ESG activities are not losing traction. Looking ahead, there was a clear consensus among our interviewees that it is more likely that they will continue to increase their ambition rather than reduce their efforts – simply because progress on climate change will have a greater impact on their business case.

Not solely in Europe but, likewise, via many US- Building Performance Standards (BPS) or the Roadmap towards Sustainable and Energy-Efficient Space Cooling introduced by the Association of Southeast Asian Nations, we note an ongoing wave of more global regulations to meet the overarching goal of the Paris Agreement.

Increasing Regulatory Requirements for Transition Plans

The need for a valid climate transition plan has been accelerated in recent years by the evolving regulatory landscape. Frequently, advancing regulations aim to increase transparency, spurred by growing investor demand for climate-related risk disclosure (SEC 2021).⁹ For example, in March 2024 the SEC adopted the new

⁹ The standard has since been stayed.

‘Enhancement and Standardization of Climate-Related Disclosures’ to ensure more consistent, comparable and reliable climate-related disclosures (SEC 2024). The regulation necessitates the provision of information concerning a registrant’s climate-related risks, encompassing transparency and disclosure of the company’s GHG emissions. Additionally, it addresses aspects related to the oversight and governance of climate-related risks by the registrant’s board and management. However, unlike other examples the regulation does not require Scope 3 disclosure. In recent years, the EU has also enacted additional directly real estate-related regulations on various levels, stemming from the Sustainable Finance Initiative (RICS 2023, WGBC 2022).

As a result, the disclosure of transition plans is increasingly becoming mainstream, driven by regulation and the shift of private capital sources towards more resilient and decarbonized investments. Consequently, organizations that have prepared for foreseeable regulatory changes are proactively avoiding regulatory shocks (WGBC 2023).

Voluntary Today, Compulsory Tomorrow

Figure 5 below illustrates that not only countries but also more and more large cities are setting themselves a Net Zero target.



Figure 5 City Net Zero Commitments in relation to the total Population (NA)

In this wave of new regulations, a pattern can be observed. Many of the industry’s voluntary initiatives and best practices eventually evolve into the new regulatory standard. Many US cities, such as Seattle or Boston, followed the example of New York and passed a carbon regulation, penalizing landlords if their buildings exceed the emissions limit set by the city (NYC 2022, Boston 2023, Seattle 2024). Investors, developers, and asset managers who already ensured a high LEED certification standard for their assets or/and were GRESB survey participants, were obviously better prepared once regulation was established. This exposed them to a substantially lower risk of being fined.

In order for governments to approach their GHG mitigation targets, the development and implementation of new green laws will become more frequent. Voluntary sustainability measures will become binding over time.

Market participants can anticipate the change in regulations and adapt accordingly to achieve competitive advantages and, hence, a better performance. The downside of not adjusting companies in advance are becoming more apparent as well. Delayed action might force companies to source construction material in times of higher demand, limited capacities, significantly increasing refurbishment costs.

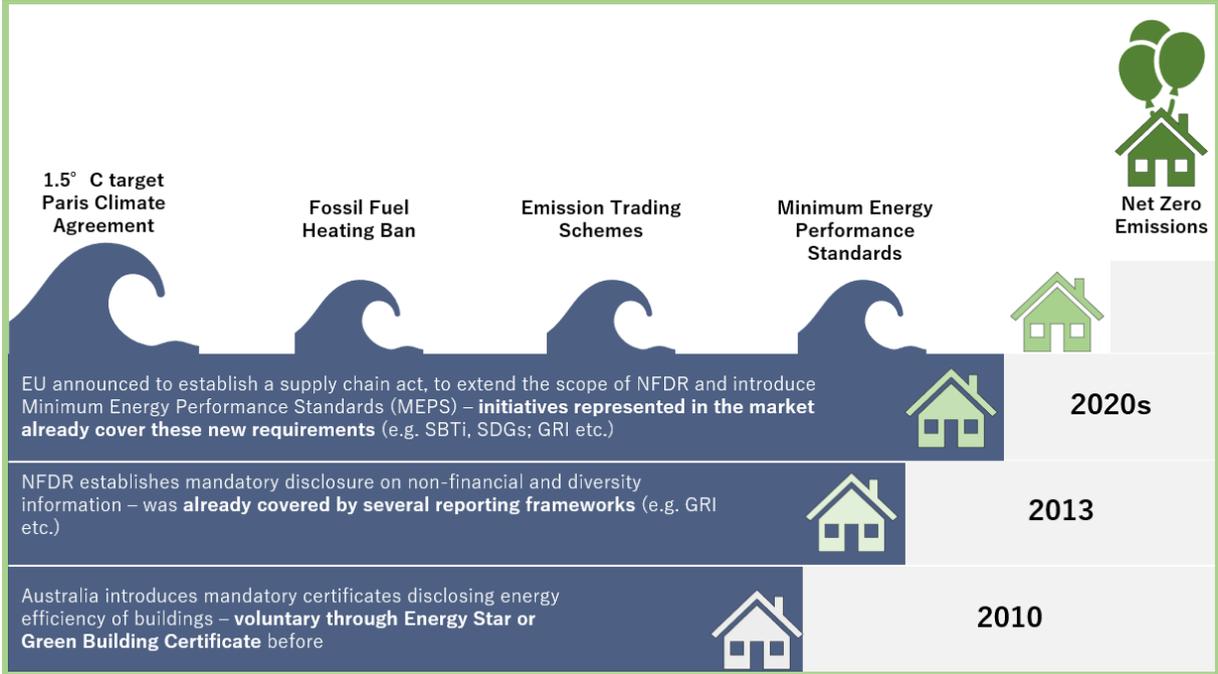


Figure 6 Waves of regulations (Own illustration)

Avoid Transition Risk – Be Ahead of the Regulation Curve

Constantly tightening requirements and growing industry standards, initiatives, tools etc. related to climate change make it difficult for boards and MDs to ensure having an appropriate overview and knowledge of what needs to be taken into account. Looking at the policy database of the IEA, the density of regulation being enforced globally has significantly increased since 2010 – with no sign of slowing down any time soon (IEA 2023).

Buildings which no longer comply with decarbonization requirements are exposed to transition risk (see Figure 7). In order to avoid such risk there is a clear incentive for companies to position themselves above the current regulatory standard in order to ensure future compliance.

In certain regions, the wave of regulations might not hit as strongly as in others. Therefore, many major international investors and tenants are already setting certain minimum standards for their holdings, regardless of the country they are investing in.

Even Investors Advocate more ambitious Regulatory Frameworks

Interestingly, today’s decarbonization agenda is not solely driven by politicians, scientists, NGOs, or other pressure groups anymore. Investors and big corporates actively call for more regulation to address climate-related disclosure, urging governments to implement additional measures.

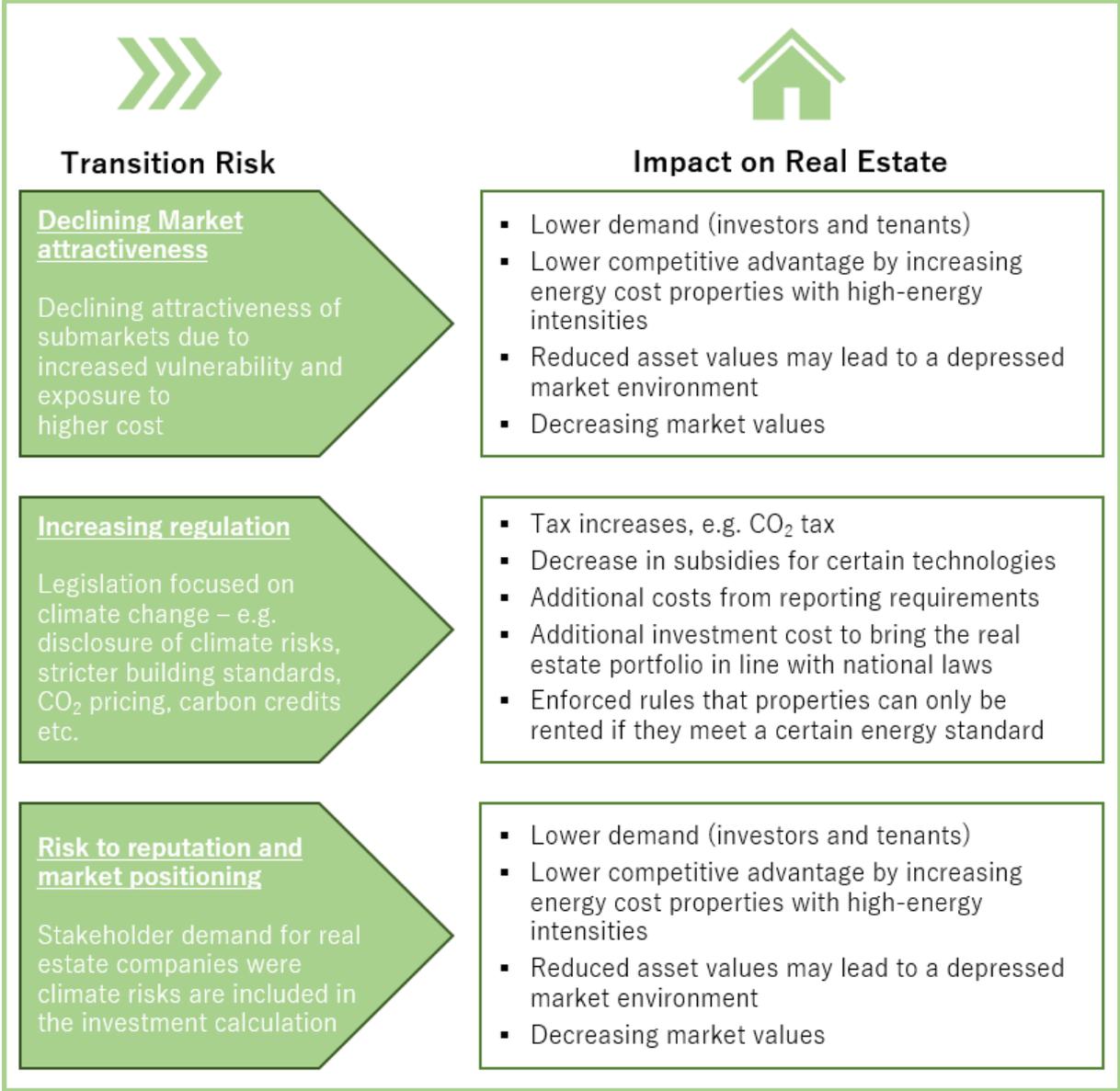


Figure 7 The impact of transition risk on real estate (Own illustration)

To this date, investors who represent over US \$42 trillion in assets under management in aggregate have advocated for mandatory climate risk disclosure requirements (Investor Agenda 2022, PRI 2022, Climate Action 100+ 2023). These should clearly be globally aligned with the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) and now the ISSB.

5.4 Corporate Transformation – Holistic View Required

The first timid steps towards a more sustainable real estate sector date back 15 to 20 years. Energy and early building certificates such as LEED, BREEAM or DGNB dominated the public discussion and industry activities. In this ‘ESG 1.0’ surrounding, it was sufficient if market participants had a single-FTE who was defined as the responsible sustainability manager – often this person turned out to be assigned to the marketing department and rarely, if at all, possessed any oversight across the entire company, let alone any executive power. While building certification schemes are still much needed and very important, other issues must be added to the equation today.

ESG 3.0 is Different from Sustainability in the Early days

As sustainability and ESG became more important for companies, this led to a new organizational structure of ESG teams. In this new environment – which could be referred to as ‘ESG 2.0’ - professionals related to the sustainability department were often viewed as an internal advisory group for the organization. At the same time the assigned employees were expected to cover all activities from procuring green energy to ensuring proper sustainability reports. Although advanced when compared to the first approach, this organizational structure still had several weaknesses. Especially for bigger companies, a small and centralized ESG team was not well positioned to e.g., take the detailed look at every asset/project needed to be in line with the required emissions reduction targets or carry out cost-benefit analyses across all function.

To address this issue, a fundamental shift in the integration of ESG into the structure of real estate companies must be pursued. Every function will face changes, every employee must be trained – we call this approach ‘ESG 3.0’. In line with this approach, many of the experts and investors we interviewed noted that the role of sustainability teams has changed. ESG teams are now more of an enabler, facilitator, and communicator, whereas in the past they were expected to do a lot of the work themselves. There has also been a significant increase in the specialization of staff within the ESG team.

Race to Net Zero is a Challenge for each Employee

Because structural changes are usually a protracted and complex process, there is a serious risk of underestimating the span of transformation required. Sticking to conventional management approaches to achieve de-carbonization goals will ultimately lead to inferior results. If, for example, a company decides to introduce more ‘Green Leases’, but the asset managers are only incentivized to reach conventional financial KPIs – such as prolonging contracts at a certain rent – the number of contracts with sufficient green lease clauses will most likely not be increased significantly. The same issue applies for developers. If they fail to incentivize their project team to use materials with low amounts of embodied carbon, the employee in charge will stick to conventional construction tech-

niques instead of aiming to increase the extend of recycled materials etc. Interestingly, raising employee awareness was a top priority for many of our interviewees, stressing the need to ensure a holistic approach.

5.5 Put a Price Tag on Change – Penalization vs. Incentivization

Although the urgency and the necessity of change is commonly recognized, oftentimes it will come down to the question: How much will it cost us?

Understanding the cost-benefit of carbon reduction measures was essential for all our interviewees. In this context, long-term benefits were often harder to grasp, or to some extent akin to looking into a crystal ball, i.e., cryptic, and therefore potentially undervalued. As more financial evidence of green premiums and/or brown discounts becomes available, the link between the cost of retrofits and the resulting benefits becomes ever clearer. This is essential as our respondents stated that their ‘customers want to see the numbers’.

Cost-benefit Analysis Must be a Standard Practice for Net Zero Measures

When it comes to communicating with their shareholders, our interviewees cited significant differences in the approaches that they used. Some revealed that they found it ‘quite complicated to talk directly about Net Zero’ as opposed to simply framing the issue as ‘savings’. Again, we find that putting a price tag on change while ensuring the financial (long-term) benefits of decarbonization is absolutely essential to successful implementation.

In order to put a price tag on change, real estate companies need to analyze their existing assets and map out the required retrofits for these properties. Depending on the starting point, some investors might require a lot more capital in order to future-proof their investments than others do.

Long term Targets Have to be Promoted by Financial Benefits

Most market participants are aware that there are several reasons to invest in refurbishments and GHG reduction for the long term. An increasing majority of CEOs (70% of US CEOs – up from 37% the previous year) have even stated that their ESG strategy affects their financial performance (KPMG 2022). In the short term, however, there still appears to be a clear disconnect between financial and sustainability goals. As such, market participants will have to find a way to both incentivize (or penalize) the purchase of low- (or high-) emissions buildings as well as penalize (or incentivize) unnecessary carbon emissions (emissions reduction). Asset managers in particular

are rewarded neither measuring nor for reducing GHG emissions of their assets in conventional management contracts. Measurement and reporting of the required data to enable the quantification and, in a second step, monetization of carbon emissions take time and require investment in a more sophisticated IT-landscape.

Regulated penalization of GHG emissions is already happening in some countries (including some in the EU) through carbon pricing. The EU's Emissions Trading System (EU ETS), for example, limits the right to emit specified pollutants for certain areas and industries. Current plans for ETS-II are also taking into account including real estate within a comparable trading system. The German government has also already introduced a price for GHG emissions that include the building sector from 2021 onwards. As in many other jurisdictions where comparable instruments have been introduced, the pricing for emissions started at a fairly low level but has increased automatically over time and continues to do so.

The EU is not the only jurisdiction that is introducing ETSs. Many countries in Asia (e.g. Japan, Singapore and China) have already done so or are planning to introduce an emission trading system that at the very least indirectly affects the local real estate industry (Reuters 2023, ICAP 2023).

Carbon Prices are Rising

Although the average price in 2023 of around 80€/t for EU-ETS carbon might already seem fairly high, the social cost of one-ton of CO₂e – the monetized value of the damages to society caused by an incremental metric ton of CO₂ emissions – is 185\$, much higher than current prices (Rennert et. al. 2022). While the full social cost of carbon is not reflected in any regulation as yet, it indicates the direction towards which where the authorities could be heading (World Bank 2023).

Danger of Carbon Bubble

While the real estate industry may not presently be directly affected by this system, the rising prices in the trading schemes clearly show that emitting CO₂ is or will be increasingly penalized by regulatory authorities.

Acknowledging the rising cost of GHG mitigation will be crucial for real estate investments in the upcoming years; as such, the first prominent voices of the industry have already begun warning of 'carbon bubbles' (Financial Times 2022). They point to the discrepancy between current market value and the fundamental value taking green premiums and especially brown discounts into account. Given that an estimated 90% of office stock in 10 years old, there is a high likelihood that this stock will fail to comply with future energy standards and retrofitting rates. (JLL 2022). Therefore we advocate not only for a thorough cost-benefit analysis for retrofits, but also for the consideration of future costs that may not be apparent at first glance (Chapter 7).



Figure 8 Historic Price Development of EU ETS Futures (Source: Investing.com)

A photograph of a lush forest. The scene is dominated by large, gnarled tree trunks covered in green moss. A dirt path winds through the lower part of the frame, surrounded by dense green undergrowth and smaller trees. The lighting is soft, suggesting a shaded forest environment.

6. Green Governance Enabling Net Zero Commitments

6. Green Governance Enabling Net Zero Commitments

The real estate sector has changed in the past decade, and its governance models must change with it. We no longer see any sign of the proverbial ‘strong man at the top’ or even a select few who ensure that ‘shareholder value’ be maximized. Real estate executives now cannot only pledge and commit on paper or act because stakeholder pressure demands it: Real estate leaders now need to be the pioneers for a new age of governance models. We must acknowledge the major structural shifts which are disrupting our industry, and thus view climate change as an ongoing challenge that will continue to be high on every boardroom agenda for the next few decades. Too many CEOs and MDs remain stuck in a mindset of pure shareholder capitalism thinking. This approach will prove to be insufficient for all our societies and the planet, as well as harmful to every real estate investor’s business model in the long run.

Besides the major challenges addressed in the previous section, the real estate industry faces further operational hurdles on its way to Net Zero. These are related to the heterogeneity of their assets, allocation of responsibilities, data gaps, and other pitfalls. While all these aspects might be an obstacle for market participants’ emissions reduction goals, the challenges can be overcome. In this difficult environment, we believe that the appropriate Governance is a key ingredient for the successful implementation and long-term effectiveness of transition plans. Since the term Governance is quite broad, we call our approach ‘Green Governance’.

6.1 The Net Zero Jungle – A Structured Overview

Relevant frameworks and leading voluntary commitments for Net Zero can be clearly defined within the real estate sector¹⁰. However, with the almost weekly appearance of a new guideline, framework or dedicated decarbonization initiative somewhere in the world, it is a challenge for market participants to clearly identify what is relevant to them in this ‘decarbonization jungle’. Nearly all national industry associations or initiatives targeting the real estate sector seek to support their members’ ESG concerns. Depending on the focus, some associations provided more guidance on issues to be addressed at the corporate level, others created platforms for collective commitments,

¹⁰ See also [WGBC 2023](#) p 15ff.

and still others defined more concrete frameworks and pathways to provide roadmaps to accomplish Net Zero by 2050.

Real estate companies should consider the following points when selecting commitments/pledges, frameworks and pathways/goals for their real estate holdings:

- Corporate-level pledges and commitments should also be aligned with asset- and portfolio-level activities and frameworks.
- All resources should be science-based and not exposed to industry lobbying.
- Resources should be related to the company's core business (e.g., specific to asset management, banking, etc.).

There are different levels and players in this maze of offerings that should be distinguished. The following initiatives and frameworks are not exhaustive and therefore represent only the dominant touchpoints in this area – those presented here are all active in more than one country.

In general, any Net Zero commitment and pledge can demonstrate a clear long-term goal to decarbonize the company's operations. For example, real estate market participants can become signatories to the '*Net Zero Asset Managers Initiative*' (NZAM), the '*ULI Greenprint Net Zero Operations Goal*', the '*Better Building Partnership Climate Commitment*', or the '*Net Zero Carbon Buildings Commitment*' by the WGBC.

The '*Better Building Partnership Climate Commitment*' for example targets the decarbonization of buildings (covering scope 1–3) by 2050. Furthermore, the pledge requires participants to disclose progress in both implementation and decarbonization.

'The Science Based Targets initiative (SBTi) is the leading global initiative that enables companies to set a target in line with the 1.5°C pathway. This initiative covers all sectors, offers a wide range of resources and in particular provides services for company target validation. The SBTi decarbonization targets and standards (see e.g. Corporate Net Zero Standard in 2023) for real estate are fully aligned with the 1.5°C -pathways derived by CRREM, since the partnering of both organizations in 2022.

The most comprehensive transition framework for making 1.5°C aligned commitments is the *Net Zero Investment Framework (NZIF)* developed by the *Institutional Investors Group on Climate Change (IIGCC)* in collaboration with Ceres, the *Asia Investor Group on Climate Change (AIGCC)* and the *Investor Group on Climate Change (IGCC)* (together forming the Paris Aligned Investment Initiative) – currently available in its updated Version 2.0. The implementation guide is again supporting by CRREM for real estate¹¹.

11 For more details see: [IIGCC 2021](#), [IIGCC 2023](#), [IIGCC 2024](#)

*Pledging Glasgow Financial Alliance for Net Zero (GFANZ)*¹² is a global coalition of leading financial institutions committed to accelerating the decarbonization of the economy as a whole. Some organizations participating in GFANZ like the *Net Zero Asset Owner Alliance (NZAOA)* also recommend CRREM as the most relevant target and instrument to decarbonize real estate (UNEP FI, PRI 2023).

Recently, more initiatives directly addressing the banking and finance sector have emerged. The *Net Zero Banking Alliance (NZBA)* and its 'Guidelines for Climate Target Setting for Banks' or 'NZBA Transition Finance Guide' provide detailed guidance for banks on how to decarbonize their operations including real estate used as collateral, which also indirectly impacts the property sector.

Other initiatives, such as the Partnership for Carbon Accounting Financials (PCAF), support these decarbonization efforts by providing a framework for measuring GHG emissions in the financial industry. PCAF also supports CRREM and leverages its resources.

The Climate Action 100+ Net Zero (CA100+) initiative also provides companies with resources to achieve emissions reductions in alignment with the Paris Accords. This initiative defines recommendations designed to enhance climate risk governance and disclosure. Similar to GFANZ and SBTi, CA100+ targets a wide range of sectors including the real estate market.

The World Green Building Council's global climate action program, 'Advancing Net Zero,' focuses exclusively on the real estate and construction sectors. It aims to decarbonize these industries by 2050 with a number of valuable recommendations, guidance and roadmaps, like e.g. also the results of the *#BuildingLifeProject*.

12 The GFANZ coalition includes the following sub-coalitions: Net-Zero Asset Owner Alliance (NZAOA), Net-Zero Asset Managers initiative (NZAM), Paris Aligned Asset Owners (PAAO), Net-Zero Banking Alliance (NZBA), Net-Zero Insurance Alliance (NZIA), Net Zero Financial Service Providers Alliance (NZFSPA), Net Zero Investment Consultants Initiative (NZICI).

In summary we can distinguish four categories relevant for Net Zero in the real estate sector: (Industry Bodies/NGO's, Net Zero Initiatives, Frameworks and Targets/Pathways) (Figure 9):

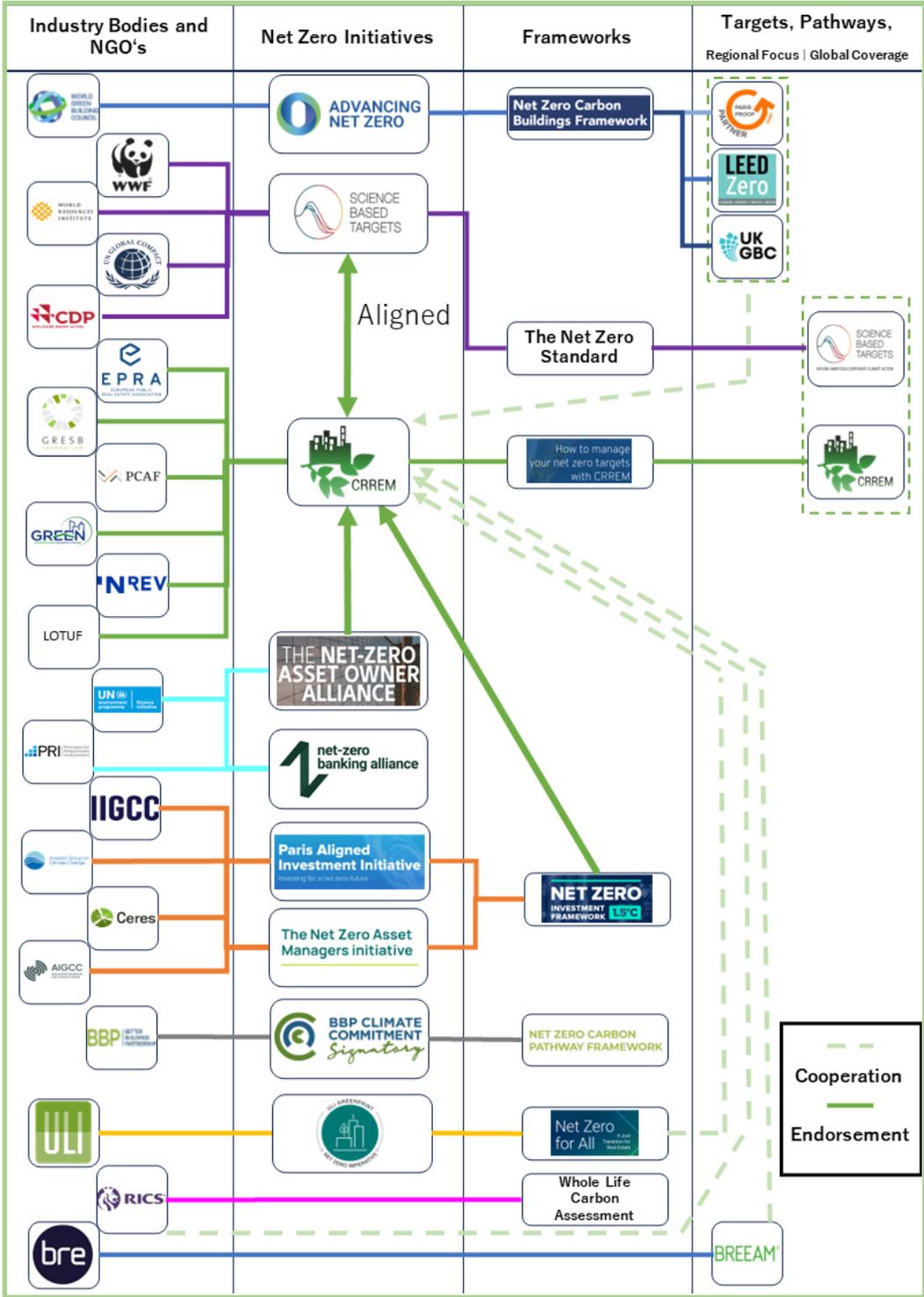


Figure 9 Overview of the Net Zero Jungle (own illustration adapted from original source: IPF 2022)

NGOs/industry bodies have a broader scope related to real estate or finance in general – thus ESG and decarbonization are just one of several aspects their stakeholders may be seeking guidance on. Many of these globally well-known industry bodies are participating in or have started their own Net Zero carbon initiatives.

Depending on the initiative, the target audience may be broad or sector-specific. Most Net Zero initiatives provide and develop their own frameworks and overarching commitments for participants. In terms of specific targets for real estate, most initiatives and industry bodies refer to the CRREM pathways. It can be expected that initiatives and policymakers will focus more on guidance and resources to ensure the credibility and reliability of published commitments and related climate transition plans. Furthermore, it is likely that they will enforce more general/overarching requirements for frameworks in order to avoid weak targets and greenwashing. Two first developments in this direction are:

- The *'UN High-Level Panel of Experts'* and its report *'Integrity Matters: Net Zero Commitments by Businesses, Financial Institutions, Cities and Regions'* and related implementation checklist.
- GFANZ's *'Guidance for Transition Plan Expectations'* and its report *'Financial Institution Net-zero Transition Plans'*.

6.2 Defining Green Governance – Helpful Concept or Just a New Buzzword?

In seeking to elucidate and analyze the term 'Green Governance, it becomes clear as to why this definition and conceptual approach will be helpful in deriving transition plans and, ultimately, achieving defined targets.

Green – Although the term is often applied interchangeably with 'sustainable', we note a small difference between the two concepts. Sustainability does not focus solely on environmental issues, as it also includes other aspects, such as the social. On the other hand, 'green' refers to activities that are specifically aimed at protecting the natural environment. Clearly found within the 'Environmental - E' of ESG, the part that is related to Energy and Carbon Emissions is that which typically has the highest materiality and priority for the real estate sector.

(Corporate) Governance – While there are a multiplicity of definitions for this term, simply put, corporate governance includes the ‘procedures and processes according to which an organization is directed and controlled’. The term ‘specifies the distribution of rights and responsibilities among the different participants in the organization (...) and lays down the rules and procedures for decision making’ (ECB 2004).

Green Governance – Combining the two concepts presently under discussion, Green Governance describes both a corporate system and a bundle of internal and external mechanisms to support a company’s processes and organizational set-up with the aim of striving for ambitious environmental outcomes – in particular Net Zero decarbonization by 2050. A principal component of Green Governance is having a level of sufficient support from senior management.

Tone From the Top Required

This requirement is closely related to the oversight of climate-related risks that the companies’ executives exercise. This proceeds then to, the management and supervisory board’s role being one of assessing and managing the identified climate risks. Given the high materiality of the challenge, the level of attention should be the same as for other financially material matters. A profound disclosure of a board’s oversight and activities related to these aspects is essential and must be in line with, the TCFD-framework recommendations (TCFD 2017), or the more recent standards IFRS-S1 and S2, the ESRS etc. building on the TCFD recommendations.

The tone being set by the top level also entails the executive’s responsibility to ensure that adequate policies and strategies are in place in order to achieve defined (short, midterm, and long-term) goals. Green Governance thus also guarantees the proper implementation of Net Zero commitments within all required functions, measures, and products of a company and its operations.

Supervisory and management boards, executives, and other company leaders all face the same challenges occasioned by climate change: Whereas these leaders are typically appointed for a 4-to-5-year term, the challenges and risks posed by climate change extends into far beyond their mandates well into the long-term. Company leaders might therefore have to accept lower financial performance in the short term (due to high costs related to energetic refurbishments and other mitigation and adaptation measures) in order to ensure a bullet-proof business case that might only then bring benefits that their successors will enjoy.

Climate Change Poses Specific Risks which need Massive Management Attention

Any good corporate governance must manifestly and intrinsically encompass effective mitigation and adaptation measures. ESG and climate risk are hence, just one of many aspects that impacts a company’s business case and, ultimately, its financial performance. Nevertheless, this importance is often underestimated: Climate risk is qualitatively different from other facets affecting the competitive position, such as digitalization or the war for talents. Climate change is highly complex and uncertain, affecting business in unprecedented ways, evolving over time and influenced by many different aspects. Climate Change encompasses macroeconomic shifts, social unrest, policy and technological changes, and many other various aspects that could affect individual assets and/or the entire business case, as well as the competitive position of real estate companies. Although boards do face other competing priorities, climate risk should be their top-of-the-agenda-item.

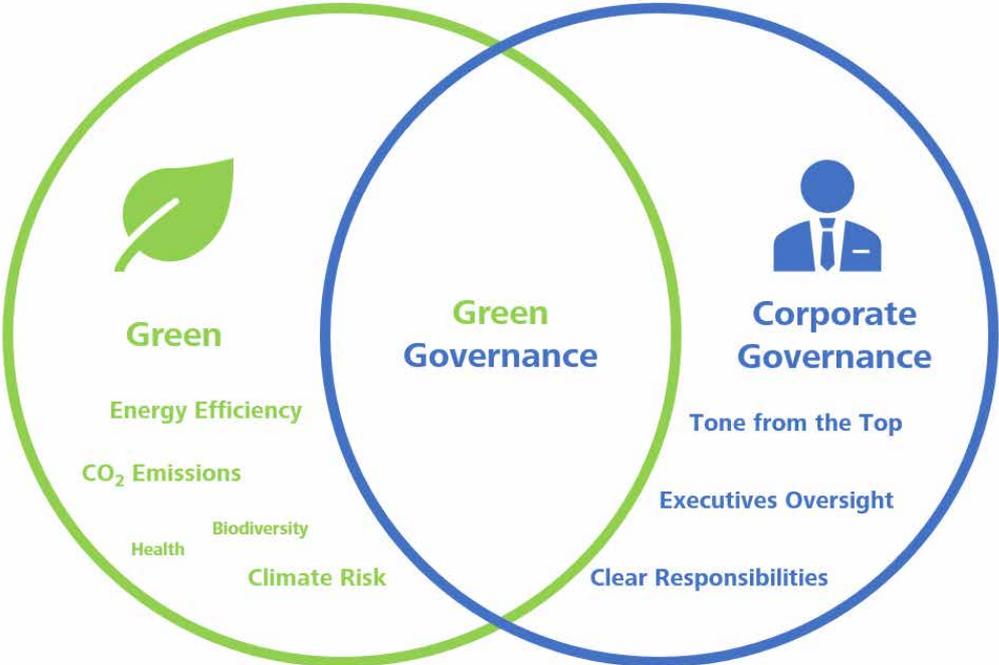


Figure 10 Green Governance origin (own illustration)

Overcoming Short-Term Thinking

Executives must overcome today's short-term crisis-oriented management and, instead, focus more on long-term strategic implications – to be complemented with action to tackle climate change, raise awareness of social challenges related to housing, and seek countermeasures to address loss of biodiversity due to ongoing greenfield developments. We must acknowledge that our world is increasingly facing disruptions of every kind. Once people, nature, and individuals become more relevant to the company, a management style that practices a less of a top-down approach will then be required.

The suggested holistic framework developed in this report will provide market participants with a step-by-step approach, starting from setting the right targets for a Net Zero Commitment up to outlining the operational measures and structural changes that must be undertaken in order to achieve set goals and ensure proper implementation. The decarbonization component thus will be consequently integrated across all levels of the company.

To date, only a few real estate companies have presented (green) governance disclosure aligned with the TCFD's or WEF recommendations ([TCFD 2023](#)). Minimum requirements include the aspects in the following box.

Minimum requirements, some aspects of which can be seen in the following box, these are mainly board-related aspects that may demonstrate a credible transition plan ([CDP 2023](#)).

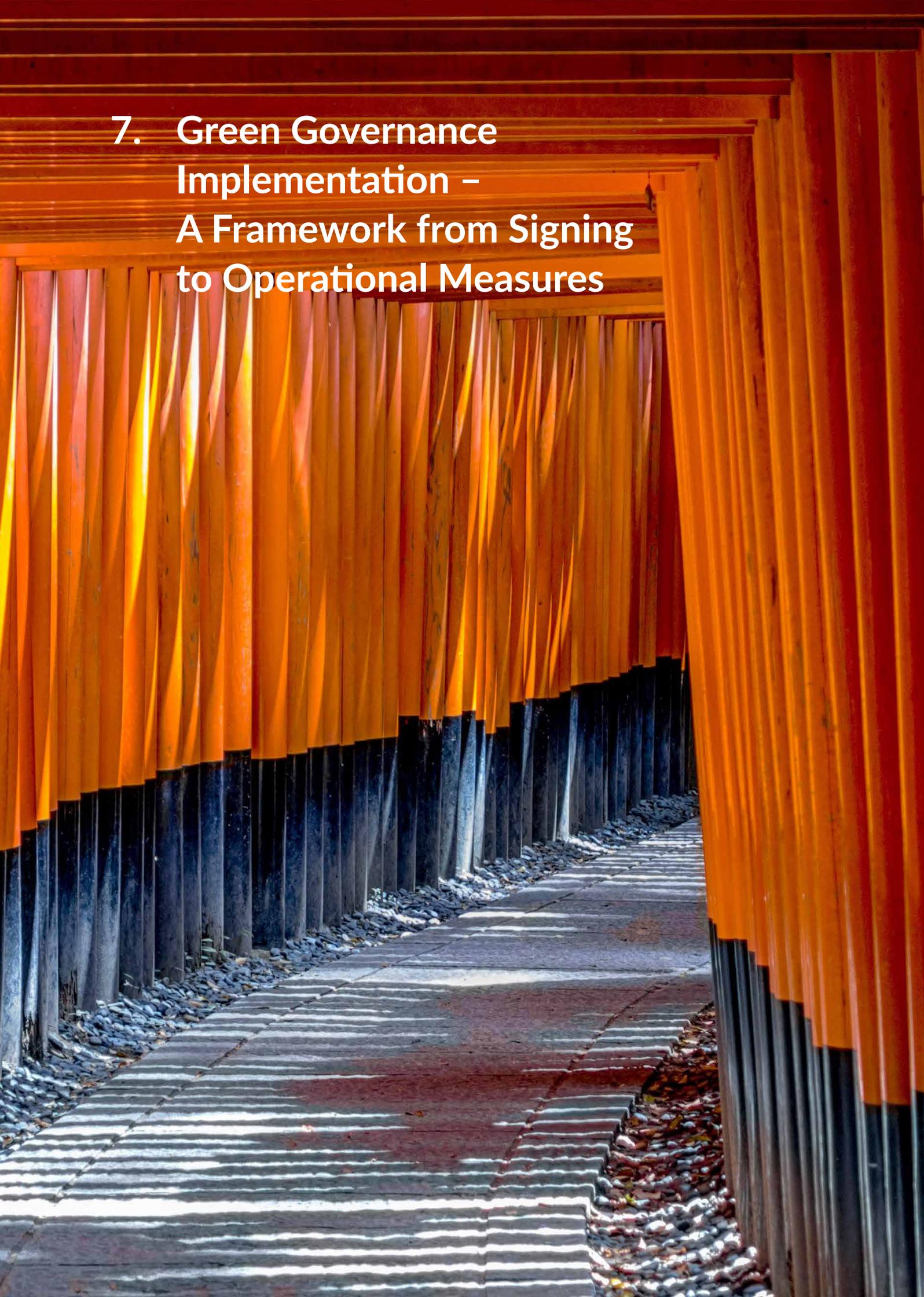
Minimum Requirements:

1. **Climate accountability:** Boards/MDs are responsible for shareholders-value and long-term stewardship of the company which includes resilience against shifts in business case including aspects driven by climate change. This implies finding answers to the following questions:
 - Are climate risk and opportunities assessed and priced?
 - Is the (double) materiality of climate risk transparent?
 - Is the information and understanding of this topic in general sufficient?
 - Are company leaders able to inform stakeholders/shareholders sufficiently regarding climate related matters?
 - Are internal and external performance checks underpinning this perception?
2. **Clear responsibility and established committees:** Are committees and/or specific board members /MDs responsible for climate risk management? This implies answers to the following questions:
 - Does the boards composition reflect the challenges?
 - Has a gap analysis and competence check been carried out?
 - Are board members clearly responsible / in charge of ESG related topics?
 - Is a Safety, Health, Environment, Community and Sustainability (SHECS) Committee assisting the Board in overseeing its climate-related performance and governance responsibilities?
 - Are links to the risk committee ensured and is climate risk sufficiently and according to risk-appetite of the company embedded in risk management?
3. Ensuring **sufficient experience** in judging climate-related aspects, disclose a **competence matrix** for all board and supervisory board members regarding ESG knowledge.

This implies answers to the following questions:

 - Does the board receive training that informs them about potential changes?
 - Does the management receive external advice on specific climate related topics?
4. Define **targets and goals** including measures and milestones and reveal perception of **linkages to business case**. This implies answers to the following questions:
 - Is climate risk embedded in company-wide assessments and directly linked to products and business case?
 - Does the board ensure that the assessed short-, mid-, long-term risks are sufficiently linked to budgeting and operational measures?
 - Are company targets and strategies sufficiently reflecting the implications from climate risk assessments?
 - Were sufficient resources (e.g. staff, technology, measures, tools etc.) dedicated to the identification, mitigation and ongoing management and controlling of material climate-related risks?
5. Processes and **frequency of discussion** on climate related issues.
6. **Measures and KPIs** to be monitored and **published to ensure transparency**.
7. **Incentives and variable remuneration** should be tied to climate transition execution.
8. Ensuring that climate related issues and plans are a scheduled **resolution item at Annual General Meetings** (AGMs).

7. Green Governance Implementation – A Framework from Signing to Operational Measures



7. Green Governance Implementation – A Framework from Signing to Operational Measures

In the following sections, the structure for implementing Green Governance will be outlined. Additionally corresponding measures aimed at ensuring successful execution of Net Zero transition plans will be presented.

7.1 A Structured Process – the Key to Success

The previously described pressure forces participants in the real estate market to change their business models to be more sustainable, in particular being less GHG intensive. Moving towards a Net Zero business model is seen as an inevitable transformation for the industry, but many companies are still uncertain about how to achieve this goal, which is why they often underestimate the changes required to achieve it.

Holistic Process and not a Patchwork

Net Zero Frameworks' and sound transition plans that derive from them are a core part of the overall process. These frameworks offer an orientation towards the specific measures that must be taken in order to achieve a Net Zero commitment by a given point in time. For companies wishing to move in this direction a departure from business-as-usual will be necessary. The main frameworks to be recommended are:

- the Corporate Net Zero Standard by SBTi,
- the Net Zero Investment Framework by Paris Aligned Asset Owners,
- the Net Zero Investment Framework, Enhancing the Quality of Net Zero Benchmarks and Investor Expectations of Corporate Transition Plans: From A to Zero by IICGG,
- the CDP Technical Note: Reporting on Climate Transition Plans by CDP,
- the Climate Responsibility Monitor 2023 by the NewClimate Institute,
- Integrity Matters: Net Zero Commitments by Businesses, Financial Institutions, Cities and Regions by the UN High-Level Panel of Experts
- and Financial Institution Net-zero Transition Plans by GFANZ.

Additionally, it is advisable to examine frameworks from related industries, such as the Climate Targets Setting for Real Estate Sector Financing published by UNEP FI. These offer useful guidance for the general requirements related to the development of an implementation roadmap. Since most of the publications and guidance notes on developing robust transition plans are not real estate specific, the following specific aspects need to be taken into account:

- Shared responsibilities between landlord and tenant.
- Typically, long life-cycle of properties.
- Challenges related to data collection regarding all consumption related aspects.
- High amount of embodied carbon emitted in new construction and retrofit.
- High share of Scope 3 emissions that are also relevant for landlords.
- Tenant engagement to overcome consumption data transparency challenges.
- Availability and future cost development of technical solutions like heat pumps.
- Real Estate is location bound, resulting in specific exposure to national/regional regulation as well as (local) physical climate risk evolution over time.
- Buildings are heterogeneous – renovation plans always have to be adapted to the specific needs of a given asset.
- On-site renewable energy potential has to be identified and made accessible.

Existing Frameworks Lack Real Estate Specific Insights

Given the particular needs of the real estate industry, market participants require a bespoke solution for their Net Zero commitments. Based on the various existing frameworks, we have identified a five-step approach to key areas of climate transition governance and the implementation of transition plans. Based on the 25+ interviews with ESG heads within our sector, close analysis of existing practices, and best-practice approaches, we derived elements of good practice for the real estate sector for each area.

Key Areas of Climate Transition Governance	Elements of good practice for the real estate sector
<p>I. Identify and assess.</p> <p>Status quo – Risks & risk management</p>	<ul style="list-style-type: none"> ▪ Carry out materiality analysis to identify climate risks (which are or might in the future be affecting the business case and the financial performance). ▪ Reveal linkages to substantive financial or strategic impact on business. ▪ Ensure that data availability is sufficient to derive decisions on that basis. Carry out basic assessment of status quo of energy consumption and carbon intensities profile. ▪ Tie climate risk to general risk management. Reveal how company treats uncertainties (e.g. via use of climate-related scenario analysis). ▪ Already pricing risk if possible.

**II.
Commit and disaggregate.**

**Targets, commitments
& strategy**

- Derive targets based on quantified risk and their impact on company.
- Derive time-bound, verified science-based targets (SBTs) that are in line with the latest climate science (e.g. CRREM).
- Set near-term SBTs (2030) and long-term target (2050). Define milestones within a 3–5 year period.
- Link the targets to a corresponding pledge / commitment.
- Specify the scope of any commitment (all on- and off-balance sheet activities) and make sure the targets are comprehensive including all emission sources.
- Break down targets for business units (sector, department, region).
- Define operational responsibilities for target achievement.
- Clarify if Net Zero-targets are relevant and how targets align with 1.5°C Paris Accords.
- Even though the imperative is to reduce the company's absolute emissions for real estate it is important to prioritize intensity targets for energy and emissions over absolute targets on individual asset level.
- Define whole building targets (include Scope 1, 2, 3) for operational emissions.
- Define embodied targets for development activities and major refurbishments.
- Clearly state that fossil fuel phase out – incl. specific date- is part of the targets.
- Potentially also set targets for renewable energy production on-site
- Adjust if needed the organizational structure (and processes).
- Define F-Gas and other GHG exit strategies and targets.
- Ensure clear KPIs (aligned with CDP, TCFD, CRREM) to define status quo and ongoing progress measurement.¹³
- Ensure portfolio approach aligned with IIGCC “Net Zero Investment Framework (NZIF)”.
- Get external company target validation (from SBTi).

13 See [Sector Guidance](#) on carbon accounting

III.
Quantify and budget.

Financial Planning linkages and long-term CapEx-planning

- State how climate-related transition risks and targets influence the organization's strategy and/or financial planning and/or future capital allocation.
- Enhance possibilities in pricing risk, e.g. introduce internal carbon price.
- Link targets to CapEx spending.
- State CapEx spending plans for renewable energy production, switching energy sources (to low-carbon, e.g. heat pumps etc.).
- Define measures and costs per measure and timing of measures.
- Differentiate between normal CapEx spending requirements (due to technical obsolescence) vs. additional investments due to low-carbon-transition.
- State how deferred CapEx spending, reduced transition efforts might impact/harm the business model (e.g. reduced revenues, lower asset values, reduced tenant demand etc.).

IV.
Act, Engage and reduce.

Measures along the Value Chain, Policy & Stakeholder Engagement

- Showcase that the business model is aligned to climate model scenarios and supports limiting the global average temperature is allowed to rise by no more than 1.5°C above pre-industrial levels.
- Define decarbonization levers to achieve medium-and long-term GHG reduction targets over the targeted timeframe and quantify contribution.
- Clearly identify and prioritize urgent reduction of emissions across the value chain.
- Ensure measures are adequate to achieve targets. Exit fossil fuels combustion on site and maximize renewable energy production on site. Ensure to include climate risk assessment as part of every investment and divestment selection process.
- Provide details of climate-related engagement along the value chain and with external stakeholders. Ensure life-cycle-approaches for real estate.
- SBTi's Net Zero Standard requires that Net Zero pledges should equate to at least 90% emission reductions across the full value chain.
- Policy or technology shifts could see impacts on the upstream or downstream supply chain of counterparties.
- Include shareholders via AGM resolution in the approval process.
- Clarify the impact of defined activities and measures. Ensure that carbon credits and off-setting are just introduced for residual emissions.
- For indirect real estate investors and asset managers: ensuring that they are engaging with companies/asset owners directly, also via voting on shareholder climate resolutions at AGMs. Supporting also resolutions that are called for shifting business strategies in line with the Paris Accord.

**V.
Track and disclose.**

**Emission metrics monitoring,
disclosure and Validation**

- State continuously (annually) intensity KPIs and progress made against those target(s). Clarify any necessary countermeasure in case of deviations.
- Integrate e.g. the Level(s) indicator 1.2 methodology with relevant details from the second edition of the RICS professional standard Whole life carbon assessment for the built environment.
- Ensure transparency of GHG-data in line with leading standards (GHG protocol, GRI, GRESB-PCAF-CRREM Sector guidance on Carbon Counting etc.).
- Ensure company disclosure is aligned with TCFD requirements.
- Ensure disclosure is not partial, nor selective and covers all emissions (e.g. whole building and also F-Gases). Report on annual basis and break down into Scopes.
- Clarify if financial statements (e.g. according to IFRS) are impacted by climate change already today (e.g. IAS 36 and IFRS 16 for reasons of write downs and impairment).
- Ensure alignment with high quality Net Zero-benchmarks.
- Ensure accountability.
- Indicate the verification/assurance status that applies to your reported emissions.

Figure 11 Key Areas of Green Governance for the Implementation of Transition Plans¹⁴

Targets and strategies following the outlined process for successful transition plans must be integrated into the company's structure in order to create an intrinsic motivation towards all procedures. The corresponding measures need to affect every business area. An isolated approach for the individual functions is not expedient.

Mobilize the Organization as a Whole

Roadmaps for the transition should not be prepared in isolation by ESG experts. It is essential that the approach be developed collaboratively by all employees and departments in order to ensure sufficient buy-in once execution begins. In particular, executives responsible for (capital expenditure) budgets should be involved in defining timelines, measures, priorities, implementation steps, and controlling processes.

As real estate players disclosing transition plans must be prepared for increased scrutiny, it is essential that the plans be valid and reliable. The ESG team must ensure sufficient transparency and disclosure of achieved results.

14 Own illustration based on CDP (2023), NewClimate Institute (2023), IIGCC (2023a), IIGCC (2023b)

Adding to the complexity of the issue, implementation cannot be seen as a static one-way process, but rather as a cycle that will require continuous reflection and adjustment depending on both the individual company-related progress and changes that result from macroeconomic and ecological framework conditions.

As suggested in [Figure 11](#) there is a chronological order that should be followed when first introducing a Net Zero commitment.

Clearly, there is no such thing as a one-size-fits-all approach. The aspects shown above are however exemplary and should provide orientation. Executives should reflect on and elucidate the following aspects when developing and rolling out a specific Net Zero transition plan for their portfolio:

- Is our Net Zero commitment commensurate with the ambition level that fits with our overall company mission, targets etc.?
- Have sufficient interim milestones for our 2050 targets been integrated?
- Can we track and measure our achievements bottom-up at least on an annual basis?
- Are we aware of all the activities and measures needed to achieve our targets?
- Based on the status quo, in which areas do we lack expertise and measures when compared to a truly holistic approach?
- Are we already capturing accurate (consumption) data in order for us to derive strategic decisions?
- Do we already capture accurate (consumption) data to derive strategic decisions?
- Do we want to include any statement/ commitment also related to Scope 3 and especially embodied carbon?
- Do we have the right people and mind set to accomplish the desired changes?

The distinct areas of implementation will be extensively discussed in the subsequent chapters, accompanied by best-practice case studies from leading real estate market participants.

7.2 Determining Relevance, Transition Risks, and Status Quo

The best implementation ideas are useless if management is unaware of the company's current standing. The importance of a profound analysis of all internal and external factors that influence Net Zero-target-setting and implementation cannot be underestimated. Internal and external contextual factors essentially set the boundaries and weighting of all successive implementation steps.

In addition, the present state of emission intensity as well as the implementation measures imposed thus far should be taken into account.

Materiality Analysis as a Starting Point

We have repeatedly stated that energy consumption and GHG emissions are just one component in the broad range of possible ESG measures that, already have potential relevance for real estate investments. To calibrate the required focus, the corresponding investment level, and the management attention required for this subarea, it is of the first importance to obtain a clear picture of presumed 'materiality'. This can then eventually function as the justification for setting a high ambition level (due to significant materiality) or a lower ambition and reduced operational efforts to tackle climate change (due to low materiality). The materiality can differ between:

1. **Investors/investment styles:** For example, private equity with the intention to flip assets in the short-term vs. long-term investors, such as pension funds
2. **Countries/regions:** For instance, nations with a high focus on increasing the ambition level of NDCs by introducing new regulation to reduce emissions vs. countries that are lagging behind
3. **Business model- and stakeholders:** Such as, renting to tenants who are more demanding, whether in terms of required energy efficiency or due to generally increasing energy costs and a focus on efficiency.

In sum, the drivers of the company specific transition risk must be identified and understood. For one market participant, (increased) regulatory requirements might be the most relevant, while, for other players or in other regions, technological changes, shifting investor and tenant demand, and/or resulting pricing effects might be most impactful. The assessment of materiality is driven by both qualitative as well as quantitative aspects at the same time. These aspects can be relevant at the asset, portfolio, and/or company level.

Sensitivity and scenario analyses, both top-down and bottom-up, can raise awareness of specific vulnerabilities and risks. These analyses can help real estate companies formulate a strategic response to medium to long-term challenges, improve their risk management, and identify and close data gaps.

The goal of a materiality analysis should be to rank the importance of all possible ESG subareas. This helps to identify aspects that constitute the highest relevance for the company and in turn deserve the full attention of management. The two dimensions of the assessment are usually 'Importance to stakeholders' and possibly 'Impact on the business case'.

PAREF, a France based REIT, delivers an exemplary process of developing an ESG materiality analysis. It should be noted that a Net Zero commitment and the accompanying strategy specifically require an additional materiality analysis of contextual factors and measures that exclusively focus on CO₂e emissions. In the best practice case below, these aspects are only one part of the broader ESG materiality analysis. However, the procedure for deriving results does not differ.

Best Practice PAREF: Materiality Analysis



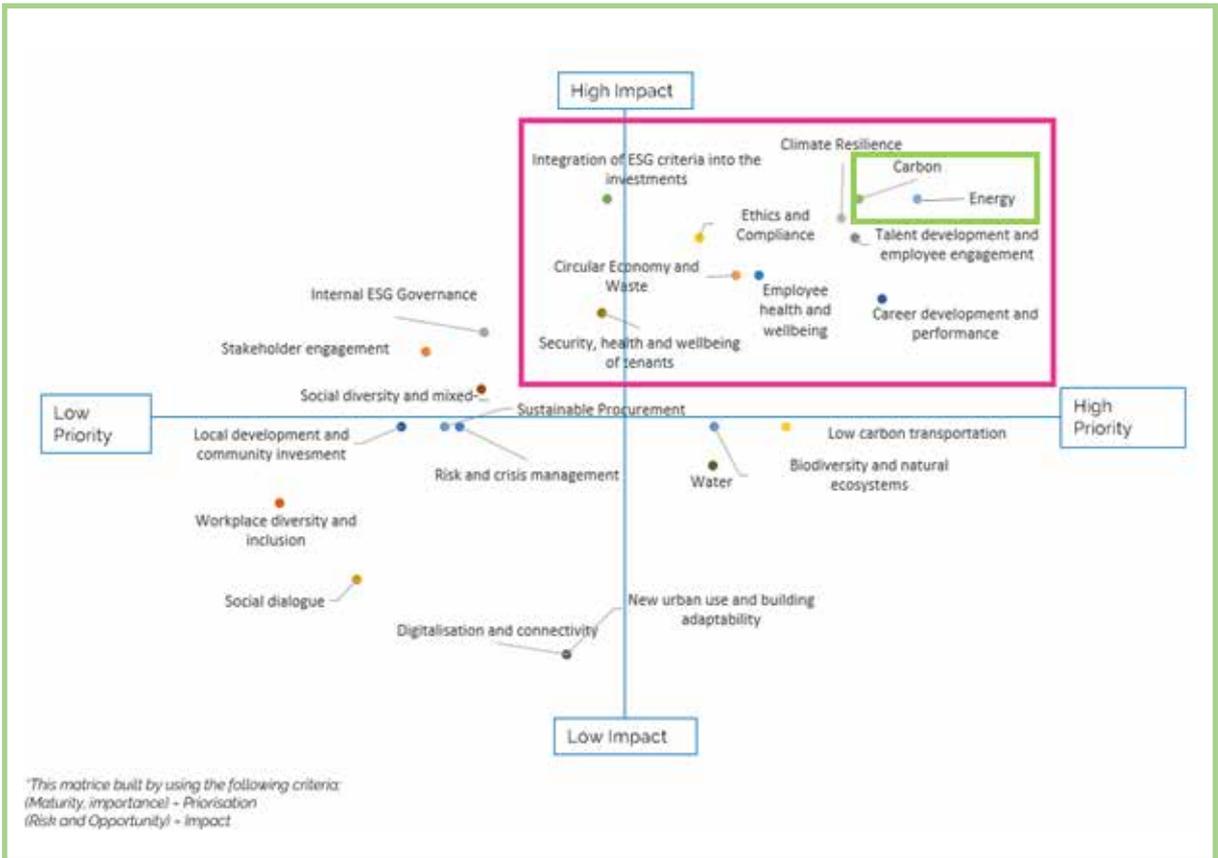
PAREF is a member of UNGC and UN PRI. The group's main business is asset management with 3 billion € AuM (as of Q2.2023). In line with the group's motto 'More than Real Estate', the group aims to continue its sustainable growth by integrating ESG into its business through its new, robust ESG strategy 'Create MORE' which was launched at the beginning of 2022. For this objective, PAREF carried out a materiality analysis in 2021.

While identifying the material issues for its stakeholders, the opinions of these stakeholders were collected by conducting stakeholder analysis through a survey. Next, the international trends in the global agenda and across the industry were identified through external trend impact analysis and benchmarking studies. While analyzing the importance of each issue for PAREF, the views and expectations of management were received through face-to-face interviews. In addition, the strategic areas shaping the company were considered in this process.

The materiality matrix is a starting point in the development of the ESG strategy and the SRI approach of PAREF. It synthesizes in a single tool the assessment of the level of importance of key sustainable development issues for the company by comparing the expectations of all stakeholders.

Thus, the materiality matrix allows a relevant ranking of the 23 ESG issues identified for PAREF according to their level of priority for management and employees on the one hand. This ranking results from assessments of maturity and importance carried out in interviews and in the questionnaire. Additionally, it ranks the issues according to their level of associated impact, calculated using the risks and opportunities of each ESG issue. The first step in identifying the relevant ESG issues took place during the analysis of a panel of benchmarks, labels, regulations, and peer ESG approaches. PAREF also carried out a broad consultation of its stakeholders in order to assess the level of priority and impact of each ESG issue previously identified. At this stage, 6 members of the Executive Committee of PAREF were interviewed via individual interviews, and all employees were interviewed via an online questionnaire on the ESG issues identified for the Group. At the end of this exercise, PAREF was able to determine its materiality matrix comprising 23 material ESG issues which were then divided into three main categories: (i) Environment, (ii) Social / Societal, and (iii) Governance. The latter makes it possible to identify the key issues today for PAREF's value creation in the short, medium, and long term, which forms a baseline for the ESG strategy.

As illustrated by PAREF, the combination of personal perception of stakeholders, research of current trends, benchmarks in recent studies, management boards views, and the resulting impact on business case forms the basis for the materiality analysis. We have repeatedly stressed that the results are of course company-specific. Nevertheless, out of 40+ cases analyzed globally, in the case of real estate investors, we note that one outcome holds true for almost all asset owners: Energy and emissions stand out in terms of their relevance to stakeholders and their (potential) impact on a company’s financial results.



Decarbonization of the Building Stock Scores Highest in ESG Materiality

This again underlines the need for a strong focus on decarbonization and energy efficiency regardless of the current regulatory requirements.

Materiality analyses are typically included in sustainability reports. The EU has now adopted so-called 'double materiality'. This term refers to the concept where companies analyze sustainability aspects from two perspectives. These viewpoints are used to derive strategically relevant sustainability themes and reporting obligations.

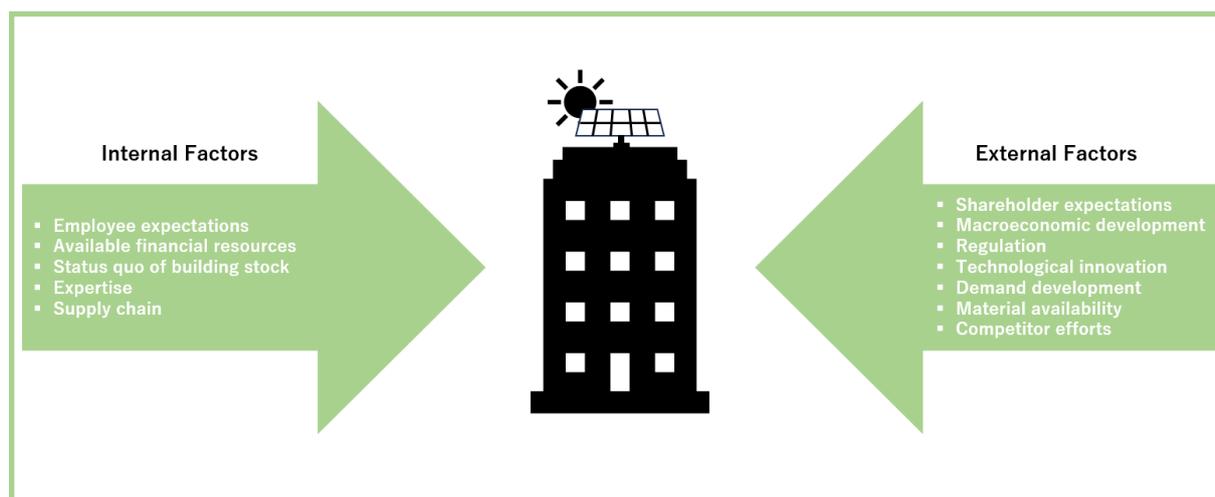


Figure 12 Internal & external factors influencing the Net Zero Commitment (Own Illustration)

'Double Materiality' Introduced by EU Regulation

One perspective is known as the 'Outside In perspective'. Companies must consider the impact of sustainability factors, such as climate change or biodiversity, on corporate success and future cash flows. Anything that influences the company's value must be taken into account.

Another perspective is the 'Inside Out approach'. Here, companies should consider the impact of their business actions on others, particularly people, society, and the environment (European Parliament 2022).

While the individual relevance of factors can differ widely, the overall direction is the same for all market participants. The factors most influential on the emissions reduction intentions of the company must be identified and optimized. An overview of the different subgroups can be found in Figure 12. These main contributing factors must be at the heart of the emissions reduction strategy that will later be developed.

Examples of internal factors relevant for a Net Zero commitment include having a suf

efficient number of skilled labor force necessary for the implementation of the strategy, availability of financial resources for the transition, current energy demand, and the supply chain. As opposed to external factors, these internal factors can be directly influenced by the management and can thus deliver a basis for potential future measures included in the Net Zero strategy.

External factors, on the other hand, are parameters that cannot directly be affected by the company. External contextual factors can include (among others) regulation, market demand, technological innovation, and efforts of competitors.

The next step would thus be to assess the current status quo in terms of a.) energy and carbon intensities of the portfolio and b.) a comprehensive list of existing measures already implemented within the company to reduce emissions. The aim of this assessment is to identify potential action gaps.

Sufficient Data Needed to Determine the Status Quo

Although the introduction of smart metering and advanced IT solutions may strengthen decarbonization efforts through implementation, it is important to establish the significance of decarbonization in general and the level of emissions early on, both in absolute terms and as an intensity indicator (For measurement and controlling of KPIs, see also section [Chapter 7.6](#)).

By conducting an ESG-focused materiality analysis, the company can derive answers to the following questions:

- What is the relevance of energy and GHG emissions-related aspects vs. other ESG factors to our business case?
- Which internal and external factors are affecting the company's ambition to reduce its carbon emissions?
- How influential are these individual factors?
- Which factors contribute the most? Which may be negligible?
- How much impact on the business case can we expect and how relevant is this impact for our stakeholders?
- What is the company's current position what is the current energy and carbon intensity profile of the portfolio?
- What has already been done, where might there be room for improvement?
- What resources (not exclusively financial) are available for the transition of the company, and are they sufficient?

7.3 Setting Suitable Targets and Developing a Feasible Strategy

There is no one-size-fits-all approach concerning Net Zero commitments and decarbonization targets.

Net Zero-Pledges – Long Term Implications Have to be Taken into Account

A public commitment to a Net Zero-pledge for all the business activities of an organization, one that includes their complete own value chain until 2050, would be the most ambitious target, and one which we would strongly recommend.

Although having the highest ambition level might be desirable for many reasons, it is important to weigh both the pros and cons inherent to it. Several factors, inter alia, must be weighted and set against the current market environment: tendencies towards a more or potentially less restrictive regulatory environment, alongside public expectations, available financing capacity for the transition, shareholder interests, and a suitable level of commitment can all differ significantly. The geographic location that the company operates in, for example, has a profound influence on the selected timeline. Thus far, we have seen both a higher regulatory pressure and a higher public pressure in Europe and parts of North America. Furthermore, in many countries in the Asia-Pacific region, general stakeholder and political support for a decarbonized world is also gaining momentum, impacting both real estate business cases and the set of 'ESG-credentials' which any property must prove in order to be competitive. It is likely that pressure on companies around the globe, including in the Asia/Pacific area, will increase in the coming years. This should thus impact current long-term planning and today's commitments. Within certain countries, we even noted that, due to a variety of regional energy efficiency requirements, it might be hard for a company to define an appropriate ambition level. In our conversations with market participants operating predominately in countries with a weaker focus on decarbonization, we found that many of them stated that they would still opt for more ambitious emissions reduction goals due to the pressure received from global capital sources and multinational companies on the tenant side. As many big real estate companies operate globally or deploy money sourced from international capital sources, many of our interview partners affirmed that the expectation of stakeholders to put a higher focus on transitory risk can be clearly noticed. Ultimately, market participants need to be aware that the timeline they choose for their Net Zero commitment must be realistic, and avoid using loose regulation as an excuse for inaction.

Ambitious, not Unrealistic – Ensuring Feasibility and Resources

The availability of sufficient (financial) resources is an important limiting factor. As for any other business target, the investment needed to accomplish the defined outcome must be projected and available. One lesson learned from speaking with several ESG heads was that, in a great amount of cases, the additional investment in decarboniza-

tion was much smaller than previously anticipated. Many leading companies are already linking decarbonization as closely as possible to the normal Capex cycle of properties. These companies can track the portion of the required energy efficiency gains that will gradually result from a multi-step-retrofit approach, and also note which measures can and should be combined to ensure (financial) efficiency. Long-term planning also requires robust assumptions and company scenarios on future energy cost development, carbon pricing, development of material costs, and availability etc. In order to accomplish this, the following questions must be taken into consideration:

- Will the costs for required materials and products (PV, heat pumps, etc.) decrease due to scaling or rise due to increasing demand of products?
- Will there be a CO₂ price related to real estate operations and, if so, how will it evolve over time? Will the company be negatively affected, or will there even be new business opportunities because of the possibility of selling carbon credits (resulting from very efficient building compared to peers)?
- Will the price for energy continue to increase dramatically, or will future increases be moderate?
- Will the demand for resilient portfolios increase, and will investors pay a premium for the efforts we undertake?
- How will competitors react to the new environment? If others are moving faster, is there a risk to be perceived as a laggard?
- Will the company face more regulatory pressure in the near future?
- How do we perceive the materiality of energy and decarbonization for our company, and what are the implications for targets?
- Do we want to set science-based targets? Will more ambitious targets be rewarded by our shareholders in the short, medium, or long run?
- Do we want to make the pledge, and should we announce our commitment publicly?
- Do we fully comprehend what part of the value chain our decarbonization targets encompasses?
- Do we include Scopes 1, 2, and 3?
- What will be needed to track and disclose these targets?
- What are the milestones?
- What are the relevant industry-organizations, NGOs etc. which we should align our targets with?
- What extent of decarbonization is fulfilled 'in house' by energetic retrofits, other energy savings, or renewable energy production, and what is achieved by offsets?

In order to derive a clear and reliable as well as transparent transition plan, executives should also define and publicly disclose the assumptions underpinning the derived targets and roadmap (e.g. policy shifts, technological changes, changes related to tenant and investor demand, scenarios regarding global warming).

Timeframe and Scope – Two Main Components of Decarbonization Targets

Any Net Zero target adopted by a real estate company consists of two key components: The scope of the emissions reduction, and the timeframe to be set for achieving the target. As explained previously, both components are heavily influenced by many internal and external factors. These are determined in the materiality analysis.

From our point of view, real estate Net Zero commitment should always comprise Scopes 1, 2 and Scope 3, a conclusion that we reached due to it being the prominent outcome during our interviews with dedicated CEOs and ESG heads in our sector.

Some companies only include their Scopes 1 and 2 emissions in target setting and controlling. Clearly, for real estate investors, Scope 3 emissions from tenant consumption and/or development activities must also be considered ‘material’ and should thus be tracked.

‘Corporate Climate Responsibility Monitor’ reveals that, although, Scope 3 emissions account for over 90% of the corporate emissions, commitments and targets still address only a limited scope of emissions sources (typically Scopes 1 and 2 and only limited or selected Scope 3 emissions), essentially leading to weak or misleading Net Zero statements. In line with these findings, *MSCI* also notes that for real estate, there remains a lack in covering tenant emissions, too, especially emissions from development activity (*MSCI 2022*¹⁵). Likewise, *GREEN* state that only approx. 1/3 of listed real estate companies include Scope 3 emissions in target setting (*Green 2023*).

We noted whereas in Europe most players are already incorporating Scope 3 in their target setting and controlling, companies based in Asia and North-America still have a tendency to only focus on Scope 1 and 2. However, many global players noted, that companies based in Asia are catching up quickly, especially in Singapore.

Absolute vs. Intensity-Based Targets

Intensity-based targets have often been criticized for not necessarily leading to real emissions reductions. Although this is of course true, we see no significant downside in promoting intensity-based targets for the real estate industry. These ensure higher efficiency for any given standing asset, which eventually leads to decarbonization. Real estate investors are constantly buying and selling assets from each other. As such, a sole focus on reducing the absolute emissions of a company might be misleading. A company could have sold substantial portfolio parts to a competitor or any other market

15 All targets cover direct emissions (Scopes 1 and 2), and most (81%) include emissions from tenant-controlled energy. However, only 57% of targets include emissions associated with developments (Scope 3).

participant and although doing so, might have reduced its absolute emissions, this act would virtually not have had any positive impact on the environment.

We note that an exclusive focus on intensity-based targets might not be sufficient (although these have final figures of barely zero), since absolute Net Zero targets guarantee a positive contribution to reaching the goal of Net Zero emissions, regardless of growth effects ([MSCI 2022](#)).

What is more, companies that handle funds as separate accounts should be treated separately. Obviously, new construction should fulfill the highest requirements and low-carbon-construction must be ensured along with very low operational energy consumption.

Long-Term Decarbonization Requires Short-, Medium-, and Long-Term Milestones

Target setting should not only consist in having the final reduction goal, but should also include intermediate short- and medium-term milestones. These milestones or interim targets are essential in formulating a feasible strategy. The interim targets should preferably consist of absolute reduction numbers relative to a base (e.g., a 50% reduction in emissions in 2030 from that in 2020).

Aside from emissions reduction targets, it can be useful to introduce additional milestones, such as retrofit quotas, CapEx investment related to retrofits, clear statements regarding changes to the business case (e.g., avoiding green-field development and a focus on retrofitting the existing building stock). Additionally, targets related to renewable energy production on-site are increasingly popular.

While some of these goals cannot be transferred directly into lower GHG emissions, they can support the transfer of the long-term targets into a feasible and better operational strategy.

Targets Determine the Strategy

The operationalization of targets begins with strategies that should be introduced into all company business lines in order to contribute to decarbonization efforts.

Lendlease – a globally integrated real estate company listed on the ASX – provides an example of how strategy building for a Net Zero commitment should be done:

Best-Practice Lendlease: Roadmaps to Net Zero



Shareholders are increasingly focusing on green governance because, as a result of the increasing impacts of climate change seen around the globe, shareholders recognize the need to turn sustainability targets into action. There is broad recognition that many companies have set sustainability targets but have limited ability to achieve those targets with their current business practices. This is because the implementation of sustainability initiatives often does not occur without strong green governance that can allocate capital, headcount, and other resources to these initiatives. Lendlease has set ambitious environmental targets in the real estate sector, called our Mission Zero targets. These include achieving Net Zero by 2025 for scope 1 and 2 emissions and absolute zero across scopes 1, 2 & 3, without offsets, by 2040. To operationalize our targets, we launched Regional Mission Zero Roadmaps, embedding decarbonization into our business strategy for each operating segment. Developed through extensive engagement with our senior leaders, the roadmaps outline initiatives to reduce scope 1, 2, and 3 carbon emissions in line with our targets. Each Roadmap has been tailored to account for regional variances in availability of alternative fuel options, renewable energy markets, technology solutions, supply chain maturity, and government policies. Importantly, performance and progress related to the implementation of our Mission Zero Roadmaps and our targets is reported quarterly to the business leadership and the Sustainability Committee of the Board to ensure the highest level of governance oversight. Further, executive compensation at Lendlease is tied to internal carbon budgets, which also helps ensure that we maintain focus on meeting our carbon reduction targets.

This strategy outlined by Lendlease consists of a holistic corporate approach and is aligned to many individual roadmaps for the business segments, regions, property types etc. With the introduction of clear roadmaps that also consider regional peculiarities, without disregarding the overarching corporate target, the path forward becomes more defined. The roadmaps Lendlease introduced emphasize again that, while certain steps are compelling, all details and resulting operational measures are usually company-specific: determining relevant factors, analyzing the status quo, identifying gaps, setting targets based on the previously identified influential factors, and introducing a strategy with intermediate targets, all while considering individual particularities.

Roadmaps Outlining the Long-Term Goals

These roadmaps are essential for both external communication (delivering a feasible and believable strategy) and for internal management. Operational measures derived from and based on certain targets and strategies will be discussed in the following Chapters [7.4](#) & [7.5](#).

Factor Potential Rebound Effects into Targets and Strategies

A feasible and reliable roadmap resulting from those targets always needs to take into account potential future changes that might not be foreseeable today. These could be related to internal or external factors. One example could be higher cooling demand due to an increase in average temperatures. These so-called rebound effects must be taken

into account when developing a strategy to ensure that they do not jeopardize the overall goal. This also includes changes that may impact the business model, possibly triggering even higher emissions.

In their internal assessments and decarbonization targets to date, only a few investors are factoring in potential rebound effects. During an interview with a global owner and operator of large grocery stores (hypermarkets), the market participant highlighted that shifts in customer demand towards fresher food products and a stronger focus on last-mile delivery were taken into account when drafting a roadmap for operational savings. While this undoubtedly adds complexity to the strategy, it also makes it much more robust and realistic.

Metro provides a best practice example on how to incorporate these rebound effects into the strategy:

Best-Practice Metro: Rebound Effects



On the way to climate neutrality, to ZERO emissions in our own business operations, which at METRO extends to 2040, we cannot only take into account our programs, initiatives, and measures which undoubtedly contribute significantly to CO₂ savings in our own business operations. However, we must also anticipate changes in the business maxim on the one hand and assess their larger CO₂ footprint on the other. We call this: rebound effects. METRO's wholesale and delivery business is clearly becoming increasingly focused on fresh, ultra-fresh, and food for hoteliers, restaurants, and caterers. Food requires more refrigeration, i. e., more energy. Customers are coming to METRO less frequently. Instead, we are more frequently coming directly to our customers with last mile delivery and food service distribution. Our emissions from our own logistics are hence tending to increase. Additionally wholesale stores in warmer climate zones require more energy to cool goods, for example, due to the significantly higher absolute and average outside temperatures than in Central Europe. Moreover, digitalization – although saving energy thanks to the resulting technical optimizations, better control, monitoring, etc. also contributes to higher electricity demand, for example, due to the many electronic devices, the actuators and sensors for lighting and ventilation control, the screens, CCTV room and market monitoring. Of course, we must overcompensate for this additional consumption through technical measures and process optimization in order to achieve the climate target by 2040. However, we must also take into account the fact that, in relative terms, there may be an absolute increase in the consumption of energy and resources. It would be naive and, in any case, not strategically determined, therefore, only to add up the possible savings. Instead, to achieve the target, we must consider and evaluate such rebound effects in the long run. If all measures, which are calculated down to wholesale market level from potential to financing, take effect, we will reduce a maximum of 83% of the emissions from the base year 2011, which means that we will have to offset or capture 17% of those remaining. We have thus calculated at the same time that we cannot rule out, that a reduction of only 70% CO₂ can be achieved via the rebound effects, amounting to an absolute target deviation of 13%. With this in mind, we can counteract the rebound effects at a very early stage.

Integrate It or It Will be Neglected

Once the targets are set and the strategy is developed, these have to be integrated within the company's services lines and the overall operation. This also entails that the corporate culture, any mission statement, and other financial targets must be aligned to the decarbonization ambition to avoid any kind of contradiction.

Third party validation of the defined targets can be useful: in particular when externally proclaiming the commitment, an independent assessment (e.g. by Science Based Targets Initiative SBTi) is state-of-the-art.

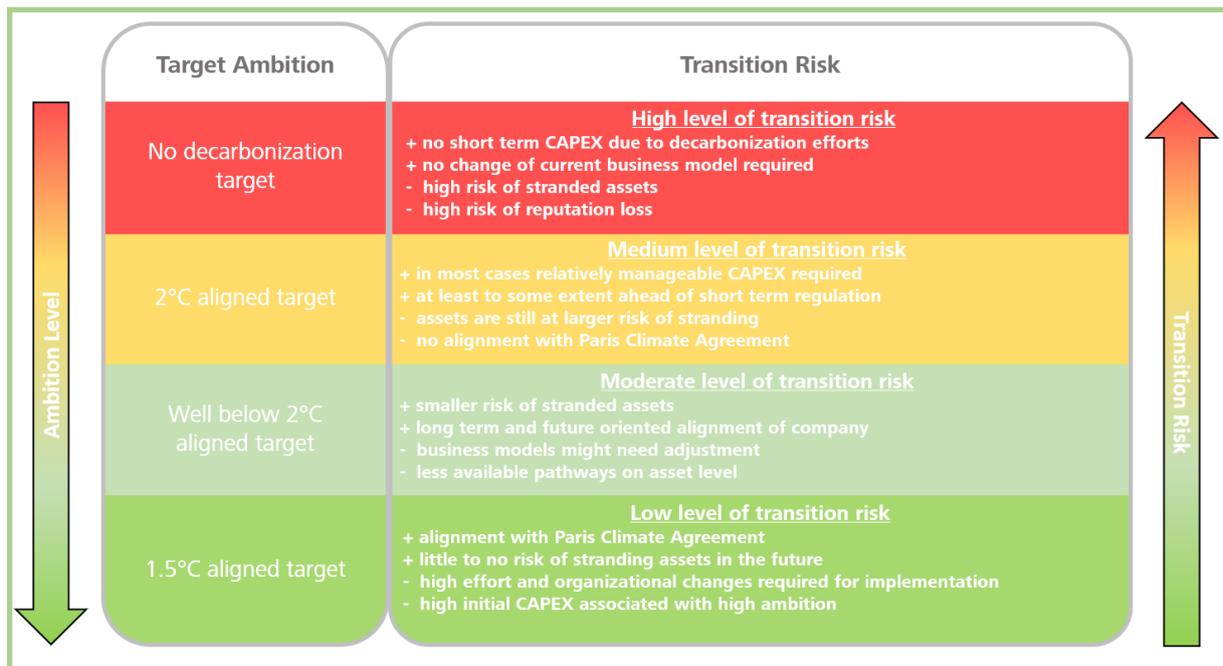


Figure 13 Target level ambition (own illustration)

Any Net Zero pledge should at least contain interim targets for every 4 to 5 years, and should also clearly set out well-defined ways to reach Net Zero in line with science-based targets from the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA), which limit global warming to 1.5°C with no or limited overshoot. For example, the CRREM pathways, provide a useful benchmark for operational GHG emissions of buildings.

After taking these steps, companies should be able to answer the following questions:

1. What are the targets we are committed to?
2. In what time span are we to reach these goals?
3. Have we introduced intermediate targets to measure progress?
4. How are we going to reach these targets, and do we have a strategy to accomplish this?
5. Is our strategy feasible to reach the goals we want to commit to?

6. What are the underlying data sources and assumptions utilized in our public disclosure to demonstrate how we intend to achieve these targets?
7. Did we validate our targets and, if not, why not?

7.4 Aligning the Organizational Structure

Part of the holistic implementation of the commitment also involves embedding the goals within the operational and organizational structure of the company. This encompasses not only the necessity for sustainability to be ingrained in company culture but also for changes to be made in responsibility and accountability.

Ensure Organizational and Cultural Redesign

The alignment of the organizational structure plays a crucial role in the green governance implementation process. Net Zero commitments are often accompanied by profound changes in both the company's structure (structural organization) and operating procedures & processes (operational organization). As mentioned in the previous chapter, these changes must be integrated into all business divisions, departments, and services of the company. Strong management support is essential for this holistic approach.

Executive Management Must Be Part of the Process

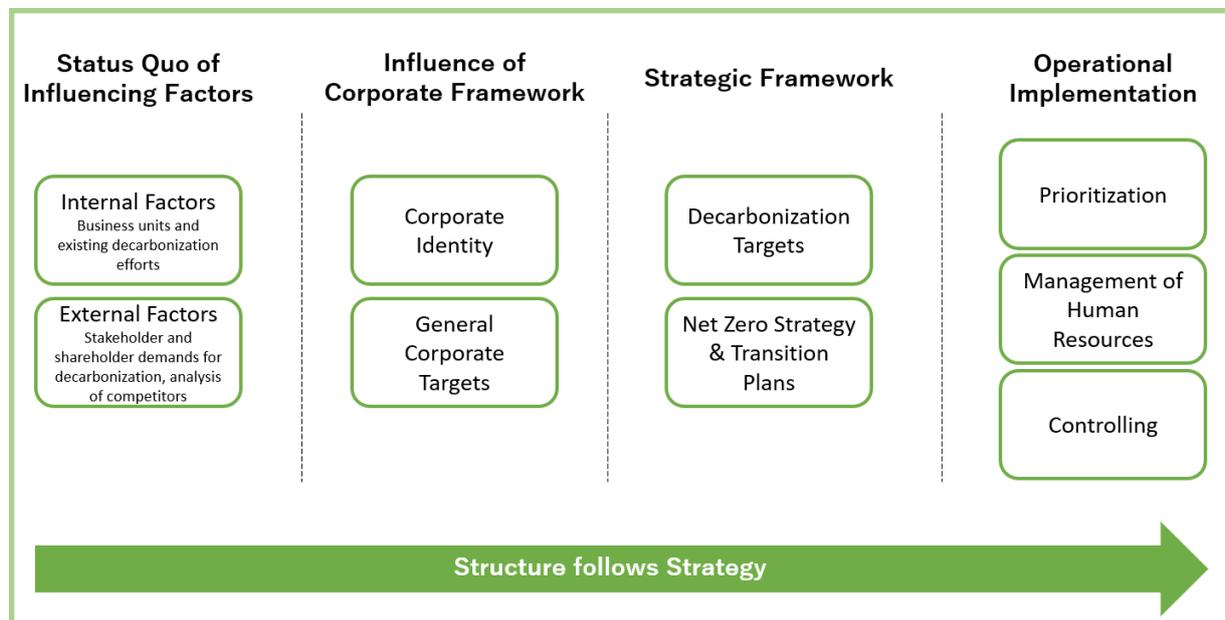


Figure 14 ,Structure Follows Strategy' in the Net Zero context

This need for executive management's involvement became starkly apparent when talking to the professionals in charge of the Net Zero transformation. Almost every interviewee stated, that the only way to implement the extensive changes, was to have

the full support of the executive management. Executive management not only needs to be part of the strategy development process, but must furthermore be held accountable for the success of the strategy. This in turn also requires upskilling of leadership in order to raise awareness for necessary changes and to shift the mindsets of the executive and supervisory boards’.

The implementation process does not solely consist in only providing rough guidelines: it is thus advisable to build a team of professionals exclusively focused on ESG-related issues and directly reporting to the executive management. In the early days of sustainability these employees were part of the public relations department, or of risk management. Over time, teams became large and began to be formed as independent operational units within most companies (see Chapter 5.4). Due to the severity and complexity of tracking and reevaluating Net Zero strategy, it is crucial for these entities to be independent and relationally closely situated to the highest management level in terms of their importance. Any measures taken in the transition process may run the risk of conflicting with the short-term goals of other company units or departments, such as finance, HR, etc. Enforcing the necessary changes, and balancing company targets and resources will therefore require substantial support from the board.

Implementing Transition Plans Is Not a Part Time Job

In this constellation the ESG team works as the central operator, moving a company towards the Net Zero commitment. They develop and evaluate the decarbonization strategies, ensure the accurate measurement of results, track and report the progress and function as the center all of ESG-related knowledge. This remit explicitly does not involve micro-managing the different bodies. One stakeholder stated in our conversations, that a 'line on carbon' in each internal board approval clearly stimulates different conversation on board level.

A more efficient way of spreading the knowledge in the company, is presented by *CBRE Investment Management*.

Best Practice CBRE: Sustainability Ambassadors **CBRE** Investment Management

CBRE Investment Management ('CBRE IM') recently launched a Sustainability Ambassador program. The aim of this Sustainability Ambassador program is to embed sustainability throughout the CBRE IM platform, across functions, sectors, countries and shared services. Sustainability Ambassadors are employees who take on objectives to drive the integration of sustainability and help in the communication of ESG performance and initiatives within their teams and the wider firm. Sustainability Ambassadors work closely with CBRE IM's dedicated Sustainability Team on ESG alignment with their main role.

Our Sustainability Ambassadors have specific sustainability objectives and are provided more advanced training (internal or external). To increase sustainability fluency at the firm-level, the Firm's Sustainability Team also conducts internal trainings for employees and clients throughout the year in various formats (in-person, webinars). These trainings have included

'Knowledge Café' sessions on specific sustainability topics and 'Q&A' sessions where employees can ask the Firm's Sustainability Team questions in an informal setting.

CBRE IM Iso teamed up with Stickerbook to simplify sustainability learning for all employees. Stickerbook is our gamified upskilling and engagement platform which drives awareness of strategic sustainability issues and rewards positive action. The process is simple: employees collect "stickers" by watching short videos to learn meaningful content quickly and enjoy friendly competition with colleagues.

We are working with an external training provider, Hillbreak, on the delivery of an in-depth video-based sustainability foundation training course for our Sustainability Ambassadors. Other leadership programs included sustainability training via Cambridge University.

By training dedicated ESG ambassadors across the various business units of the company, *CBRE Investment Management* effectively disseminates their knowledge and strategy throughout the organization. This ensures that not only sustainability experts, but also every asset manager, developer, transaction manager, and investment analyst, implements the necessary changes in their day-to-day work.

Training Programs Must be Implemented

In large corporate structures, it is especially crucial to both build specialized team strategies as well as to train the employees to embed the strategy into the company. Decarbonization capabilities must be integrated into all job roles and departments. Comprehensive training programs encompassing all ESG-related aspects, and facilitating the transfer of knowledge to various functions within the company, should be both of a long-term nature and be meticulously planned.

SavillsIM, a globally integrated asset and investment manager, can serve as a best-practice example of how to implement a company-wide and holistic ESG training program.

Best Practice SavillsIM: ESG Training



In close collaboration with Savills IM, FutureMakers advised on the positioning, role definition and recruitment for a voluntary network of cross-function 'Restorative Business Champions', a group that would not only act as an extension of the central ESG team and feed into strategic decision-making, but would also be empowered to collaborate and lead in developing solutions to some of the organisation's most complex and pressing sustainability challenges. Across 6 virtual sessions over 3 months, FutureMakers designed and delivered a bespoke tailor made programme of interventions, tools and guidance to support their development as Champions, touching on topics including business transformation, living systems design, sustainable innovation and personal resilience & mastery. Through completion of the empowerment programme, Champions are afforded the time, resources, and capacity to

challenge assumptions, supporting their teams in delivery of their ESG targets. They do this, with an eye on developing the innovative solutions of the future, all while building an impactful network of likeminded peers across the business. ESG best practice is constantly evolving. Savills IM needed to ensure that upskilling became a priority. In 2021 Savills IM colleagues were invited to all staff ESG activation session. To build upon this in 2021, a ring-fenced global ESG training budget was created whereby informal and formal learning is funded and encouraged. This includes Savills IM co-sponsoring the Better Buildings Partnership ESG Training Course which is an industry leading ESG training programme for real estate professionals delivered by Hillbreak Ltd. Other internal training has thus far included:

1. Physical climate risk integration for existing assets and new acquisitions delivered by WTW
2. An introduction to CRREM delivered by Sven Bienertto ensure decarbonization in the use phase
3. Integrating advanced ESG requirements into the acquisitions process
4. An introduction to Net ZeroNet Zero delivered by Evora and ESG Team.
5. SFDR and training provided with support from PwC.

Savills IM also supported colleagues to undertake sustainability learning delivered by a provider of their choice.

Training the entire workforce and obtaining their commitment is essential to achieving Net Zero targets. Some market participants have long established approaches for accomplishing this task. For example, Morgan Stanley's Sustainability Knowledge Hub equips employees with resources and education on how climate change impacts the firm and its clients from a business perspective.

Employees ultimately need to have a clear understanding of:

- Why the mitigation of carbon emissions is important.
- What the company's reduction target is.
- What the main emissions sources in their specific operating area are.
- How these emissions could be mitigated.
- What their individual contribution should be.
- How to keep track of the mitigation process.
- Where they can find support for this challenge.

The training should be coordinated by the ESG team in order to ensure alignment with the individual strategy and goals of the company and it should include every employee. A shared training experience and knowledge base within the company significantly enhances understanding of the issues and facilitates the creation of holistic solutions. Ongoing courses, and notifications of new scientific findings or technical solutions and learning platforms are all essential in addressing this issue.

In regards to the ESG specialist teams, we furthermore observed significant changes. Most of our interview partners not only emphasized the general need to train all

employees but also asserted that to extent that the entire company ‘moves up the learning curve,’ questions and tasks addressed to the ESG team become increasingly more complex. Consequently, there is a growing need for ESG experts specializing in specific aspects of the process. For example, *Hines* has created dedicated positions for embodied carbon, renewable energy, climate data or Net Zero Implementation, in addition to the generalists who are largely focused on operational carbon. This ensures that even very detailed inquiries can be resolved.

Challenging the current organizational set-up, companies should be able to answer the following questions:

1. Is the executive management part of the decarbonization process – Are they accountable for its success and do they support the implementation?
2. Are we putting in enough effort and implementing the appropriate measures to ensure the necessary organization-wide cultural shift, to change corporate culture if necessary, and to challenge existing mindsets?
3. Which processes and structural changes within the organization are necessary to achieve the Net Zero targets?
4. Is the ESG team independent and does it report directly to senior management? Is the ESG team appropriately empowered to deliver results?
5. Does the organization ensure sufficient transformation? Does the company have enough experts for the various knowledge areas?
6. Does the company provide enough training to employees?

7.5 Choosing the Right Operational Measures

While particular stages of the previous steps form the basis of the commitment to Net Zero it is the actual measures themselves that ultimately drive mitigation progress towards a Net Zero emissions state. Within the real estate sector, any emissions reduction initiative will involve increasing energy-efficient retrofits, low-carbon (new) construction, phasing out all on-site fossil fuel combustion, electrification of assets, and incorporating more on-site renewable energy production (as well as purchasing renewable energy). However, the actions required can be highly individualized depending on the business area, as there is no standard approach.

The particular operational measures that are necessary and meaningful for an individual company may vary depending on the specific asset, its emission profile, the level of ambition, geographic region, business case and, of course, the status quo of the organization as whole. However, based on our interviews, we observed that there is a typical set of operational touchpoints that can be linked to the real estate lifecycle. Within each phase, we identified a set of impact levers and actions (see [Figure 15](#)).

Clear Roadmap and No-Regret Measures as a Starting Point

Given limited financial capacity and resources, it is important to develop an internal road-map that identifies and prioritizes individual actions and activities. Of course, companies should make sure to start with no-regrets actions with low and immediate pay-back (installing smart meters, signing more green leases, improving data quality, installing LED lighting etc.). By doing so, market participants will automatically move up the learning curve. This will enable them to commence with more complex issues such as introducing internal carbon pricing, implementing low-carbon construction, addressing supply chain challenges, taking responsibility for Scope 3 emissions, etc.

 Development	 Transaction	 Asset Management	 Property Management
<ul style="list-style-type: none"> • Prioritize refurbishments over new construction • Track embodied carbon of construction material and try to minimize grey emissions • Actively demand low carbon emission product from supply chain • At least pre-equip developments for Net Zero operational emissions (PV etc.) • Consider whole Life Cycle of buildings • ESG training for employees 	<ul style="list-style-type: none"> • Include state of decarbonization or potential to decarbonize a building into the due-diligence • Prioritize buildings which are already decarbonized • Consider transition risk and fit with Net Zero strategy in price negotiations • Align transactions with net zero strategy and targets • ESG training for employees 	<ul style="list-style-type: none"> • Identify PV-potential and expand onsite renewable production • Include decarbonization measures in CAPEX planning • Phase out fossil fuel onsite • ESG training for employees • Create support structure for Net Zero related decisions • Incentivize decarbonization for Asset Managers • Introduce 'shadow' or internal carbon price • Prioritize tenants willing to sign green leases • Engage with tenants about energy saving practices 	<ul style="list-style-type: none"> • Closely monitor and benchmark energy consumption from building services • Maintain buildings services regularly • Install smart meters • Implement carbon accounting for assets managed • ESG training for employees • Track embodied carbon for maintenance activities

Figure 15 Operational Levers when Implementing Net Zero

Interestingly we noticed in our interviews, that many asset managers and investors are not even engaged in unlocking the potential of low hanging fruits (e.g., stopping heating over weekends – up to 20% savings). It is essential to start with simple things and introduce complexity only if necessary.

A best-practice for a structured roadmap of decarbonization and efficiency measures (so-called ‘energetischer Sanierungsfahrplan’) that were built into the normal CapEx-cycle was provided by ECE:

Best Practice ECE: Energetic Retrofit Roadmap



Energy saving measures: The course for climate-neutral “retail real estate”: How can a high-frequency property, such as a shopping center, be operated in a climate-neutral way in the future? What steps are necessary and what does it cost? To answer these questions, ECE has developed an individual energy-efficient refurbishment plan for the asset class of retail real estate. The pilot project was the Alstertal shopping center in Hamburg. The result of more than six months of intensive testing, modeling, and analysis is a comprehensive, property-specific refurbishment plan which lists all 70 recommended energy-efficient refurbishments up to 2045 and optimally integrates them into the schedule. Costs that would have been incurred anyway costs – for example, for replacing heating systems – were integrated into the plan. The refurbishment plan shows how the gap between asset performance and the necessary target decarbonization can be closed and what it will cost to be climate-neutral by 2045 at the latest. Overview of the Energy-Efficient Refurbishment Roadmap (ERR):

- 3D modeling of the current and target energy state
- Measures and their impact on the energy balance and tenants’ ancillary costs
- Customized climate protection plan which includes investment costs along a property-specific timeline
- Validation of the investments in terms of funding opportunities, apportionability, and feasibility
- Clear roadmap for the gradual achievement of climate neutrality
- Sustainable safeguarding of value retention (avoidance of stranded assets)

Speaking with global players we identified two aspects that many of them were focused on: a growing share of the investors are setting clear targets for “renewable energy produced on-site per m² NLA” (typically this was mainly achieved via PV); others stated that increasing the data coverage and data quality for ESG related aspects was the main priority.

Not Incentivizing Means Preventing

Incentivizing employees with financial rewards to focus on specific KPIs is a common theme in any for-profit organization. This approach allows managers to align employees with an overall strategy without micro-managing them. However, in the short term, some decarbonization KPIs are inversely related to other financial KPIs. This becomes problematic if only the short-term financial KPIs are incentivized. This example applies to every level of a company’s hierarchy - even senior executives can face this dilemma.

A company-wide link between decarbonization progress and compensation is thus essential.

Another area for intervention is low-carbon construction. *alstria* a publicly listed German REIT focusing on commercial real estate development and management, offers an example of how to steer building practices in the right direction:

**Best Practice alstria:
Low-Carbon Principles of alstria**



Low-carbon design Carbon Design Principles of alstria

The basis for the approach is the EU's climate strategies and German climate protection laws. We want to lead the way on this issue and help our sector by communicating our ideas, analyzing the results achieved and demonstrating achievements. Tackling the climate change crisis is one of the biggest challenges the world's economies have faced in years. Economic efficiency will always be at the forefront of decisions we make as a for-profit organization. We do believe, however, that economic efficiency needs to be examined over the entire life cycle of an asset and not only at the time of its construction. Continue using the existing building fabric and build only things you really need. During the fabrication of building products, especially with concrete and steel, very large amounts of carbon are generated. Therefore, we must try to reuse as much of these materials as possible in refurbishment and renovation projects. The carbon footprint of new buildings and constructions is so large that not even the best new energy-efficient buildings will be able to become carbon-neutral by 2050.

Use as little new concrete and steel as possible — use products that have a low carbon footprint and are durable and robust.

Planners and builders in all our construction projects are called upon to offer low-carbon alternatives to common building products. This applies particularly to concrete (aggregates, amount of cement, production) and steel (recycling, production). Likewise, the use of natural, renewable and light materials such as wood should be the rule rather than the exception—assuming that the materials are suitable and economical. The implementation of measures should be climate-positive i. e. the emissions from production should be lower than the carbon savings in operations resulting from the construction measures. In the future, specifications from the circular economy (cradle2cradle) will play a more important role, because a planned dismantling and recyclability of building products not only helps save resources but also lowers carbon emissions. Use cement replacements (e.g., PFA and GGBS) produced in Europe but avoid those imported from other continents. The potential for their use in building components with a large carbon footprint is most apparent when one considers the entire lifecycle. For this reason, the main components of a building should be examined for their reusability through a life cycle analysis (LCA) prior to a project; these particularly include foundations (~17% of embodied carbon), ceilings and columns (~48% embodied carbon) and the building envelope (~16% embodied carbon). *alstria* has therefore introduced clear internal guidelines for new projects and redevelopments ensuring low-carbon-construction to reduce embodied carbon emission related to their properties: [alstria Low Carbon Design Principles \(2024\)](#)

This example provided by the *alstria office REIT AG* is interesting in several ways. As mentioned previously, they provide guidance by introducing building principles for their employees. Additionally, they mention more technical measures relevant for market participants actively involved in constructing buildings and purchasing new developments. An example for a newly constructed building is provided by *Hines*:

**Best Practice Best Practice Hines:
555 Greenwich Project¹⁶**

555 Greenwich is a 270,000sf 16-story ground-up addition to the Hudson Square Properties (HSP) campus in NYC that includes retail space, offices, outdoor terraces, and floor-to-ceiling windows. The property has been designed for superior indoor air quality, zero fossil fuel pollution on site, and will reduce annual electrical usage by 25% and carbon emissions by 45%¹⁷ over a traditional NYC-based Class A building. With a projected energy use intensity (EUI) stranding date of 2047, the property is on track to meet the Hines net zero operational carbon 2040 goal and is CRREM 1.5oC pathway aligned. The building is also tracking to achieve a LEED Platinum rating.¹⁸

It is the first commercial development in NYC that employs a circular energy infrastructure. This is done by integrating geothermal piles, thermally active radiant slabs, a dedicated outdoor air system (DOAS), and a fully electrified heat pump heating system to provide carbon emissions reduction and occupant experience. By activating large 120' deep caissons, the foundation system has been turned into a thermal battery. Excess energy is stored annually in the geothermal piles to provide free energy that would otherwise be wasted. The stored energy is used to activate the entire building structure by cooling or heating the building floorplates. The DOAS system provides 100% free air at the point of use which is proven to positively impact cognitive function. Using heat pumps to reject heat and provide high temperature chilled water in lieu cooling towers will save 800,000 gallons of potable water a year.¹⁹



16 Case Study is for illustrative purposes, and there is no guarantee that future investments will achieve the same results. The content herein and in the report is provided for informational purposes only. Nothing above or in the report constitutes investment, legal, or tax advice or recommendations. Such content should not be relied upon as a basis for making an investment decision and is not an offer of advisory services or an offer to invest in any product or asset class. It should not be assumed that any investment in an asset class described herein will be profitable. Any projections, estimates, forecasts, targets, prospects and/or opinions expressed in these materials are subject to change without notice. Opinions or beliefs expressed in these materials may differ or be contrary to opinions expressed by others. Certain information above and in the report has been obtained from third-party sources. Hines has not independently verified such information.

17 As compared to traditional Class A high performance property with natural gas boiler, chiller and cooling tower. Projected to 2030. Assumes grid decarbonization and excludes potential on-site renewables or purchase of PPA. Based on energy model. From the Hines Carbon Impact Assessment Tool. Based off 2021 as designed energy model results. Hines confirms that, to the best of its knowledge, more updated information is not available and that the above information remains materially accurate

18 There is no guarantee the asset will achieve all of its ESG objectives.

19 Based on a calculation of the amount of cooling tower makeup water required for a traditional Class A high performance property with natural gas boiler, chiller and cooling tower.

By designing to higher environmental and energy performance standards and to meet Net Zero operational carbon goals, Hines strives to ensure that the property remains attractive to the best quality tenants as well as future buyers, including institutional investors who have increasingly higher ESG requirements.

Investors Clearly Shift to Low-Carbon-Material

Reducing embodied emissions in new construction, as well as in energetic retrofits, can significantly lower a property company's emission profile ([Hines 2022](#), [CRREM 2023](#)). When it comes to construction works, we noticed in our interviews that all investors try to pull away from steel and concrete, instead favoring reused materials, timber or simply redevelopment of existing structures. Amongst respondents we noted a growing concern that there was a lack of technical solutions for historic buildings; likewise the regulatory requirements for listed buildings were still vague in many jurisdictions.

Life Cycle Assessment (LCA) – Ensure to Address Long Term Effects in Decision Making

A significant portion of our interview partners also indicated that they are beginning to broaden their assessments for investments and development. There is a growing focus on assessing the long-term effects and monetizing qualitative aspects and KPIs related to decarbonization. Property owners must start thinking about long term harm, in contrast to short term cost savings. A LCA for both developers and investors, can be helpful to identify and monetarize these long-term effects.

Potential for Decarbonization Must Be Incorporated into the Due Diligence Process

Transaction teams play a significant role in every company's transition to Net Zero emissions. They must assess the alignment of the properties with the Net Zero strategy, in their due diligence of potential acquisitions. This does not necessarily mean that only buildings with zero operating carbon emissions should be acquired.

Potential acquisitions should, however, be scrutinized in terms of their respective energy efficiency, energy sources, potential costs of energetic retrofits, and their contribution to the overall company's decarbonization targets. Virtually all market participants confirmed this approach in conversations with us. In line with this observation, a recent study concluded that the examination of operational GHG emissions using CRREM is central to the due-diligence process in the majority of acquisitions ([Knight Frank 2023](#), [RICS 2024](#)). Associations such as RICS have published detailed KPIs regarding decarbonization, which should be assessed by appraisers to ultimately quantify potential impacts on property values ([RICS 2023](#)).

Carbon Shadow Pricing on the Rise – Ensuring Future Proof Capital Allocation

Most market participants stated that it is still challenging for them to connect their decarbonization efforts with the corresponding financial implications. For example, while the costs of, energy retrofits are often well documented, financial benefits are still somewhat opaque and difficult to measure.

Another instrument to diminish such problems and directs investments in the right direction is the introduction of a ‘shadow’ or, even better, an Internal Carbon Price (ICP). GPE, a REIT based in London, delivers a best practice on how such an approach should be designed:

Best Practice GPE: Internal Carbon Pricing



GPE Accelerates Progress to Net Zero through Industry-Leading Internal Carbon Price

Key Facts

- £95 PER TONNE INTERNAL CARBON PRICEper ton internal carbon price
- £403,750 DECARBONISATION FUND IN FIRST YEARdecarbonization fund in the first year
- LOWER CARBON SPACES FOR OCCUPIERSlower carbon spaces for occupants
- REDUCED RISK OF STRANDED ASSETS FOR INVESTORSreduced risk of stranded assets for investors

Actions

GPE’s sustainability team completed a review of best practice, peer activity and the latest research on Net Zero carbon. This led to a series of recommendations, including: Introducing an internal carbon price of £95 per ton²⁰. Whilst some companies use a shadow carbon price, GPE concluded that this approach would not have offered a real financial incentive. In setting the price, the team considered a range of factors. Although the cost of quality offsets is currently around £25 per ton this is likely to rise due to increasing demand and growing evidence that it does not cover the full cost of carbon.

- The UN Global Compact is calling on companies to set a minimum internal price of \$100 (£76) per ton.
- Given the speed of change, the price needs to be at a stable level over lengthy development projects, and substantial enough to motivate desired behaviors.
- Establishing a Decarbonization Fund to support energy efficiency projects and other initiatives to reduce carbon emissions substantially which are associated with existing buildings.

The sustainability team took these recommendations to the Sustainability Committee, which is chaired by Chief Executive Toby Courtauld and comprises Executive Committee members from across the business. There was full support for the internal carbon price and a desire to move even faster.

20 GPE’s intention is to keep the price under review to ensure it continues to drive the right behavioural change.

The Sustainability Committee upgraded the internal carbon price to cover not only embodied carbon on developments (Scope 3), as initially recommended, but also operational emissions (Scope 1 and 2). This scope exceeds what others in the UK real estate sector are doing, demonstrating industry leadership.

- Driving behavioural change and innovation to decarbonise the business faster. The internal carbon price provides a financial incentive which shifts behaviours faster and more substantially than ambitious targets alone.
- Demonstrating to occupants that GPE is a proactive landlord that operates buildings efficiently, proactively seeks to deliver net zero space and helps occupiers achieve their own ESG goals.
- Reducing the carbon emissions which GPE will have to offset annually from 2030, with more value for the business in funding internal offsets that which contribute directly to improvements within the portfolio.
- Opening a potential avenue for future acquisitions of buildings with poorer sustainability performance that which GPE then retrofits and repositions into highly sustainable real estate.

Internal voluntary carbon pricing can support long-term planning, the allocation of financial resources, and the transition to a low-carbon business model (UKGBC 2023). This instrument typically incentivizes decarbonization efforts to reduce costs and quantify potential expenditures if a defined carbon price is to be implemented in the future. It applies market mechanisms to shift the costs of emissions onto polluters or less-efficient investments, with the clear objective of discouraging carbon-intensive projects. This 'polluter pays' principle will not only drive decarbonization but also foster efficiency.

This best practice from GPE provides valuable insights for other real estate companies. Depending on the price chosen, internal carbon pricing (ICP) can be a highly effective tool that management can use to oversee the company's emissions reduction efforts. ICP could be applied not only to development projects but essentially to all stages of a building's lifecycle. With the introduction of an internal decarbonization fund, this measure directly incentivizes and fosters decarbonized solutions. Carbon pricing is subject to various influences. From a corporate perspective, executives do not necessarily have to consider the altruistic question of how high it should be to ensure the complete internalization of negative external effects to the environment; instead, it is essential to clarify which (regulatory) carbon pricing effects should be expected to influence the company's assets and ultimately the balance sheet in the future.

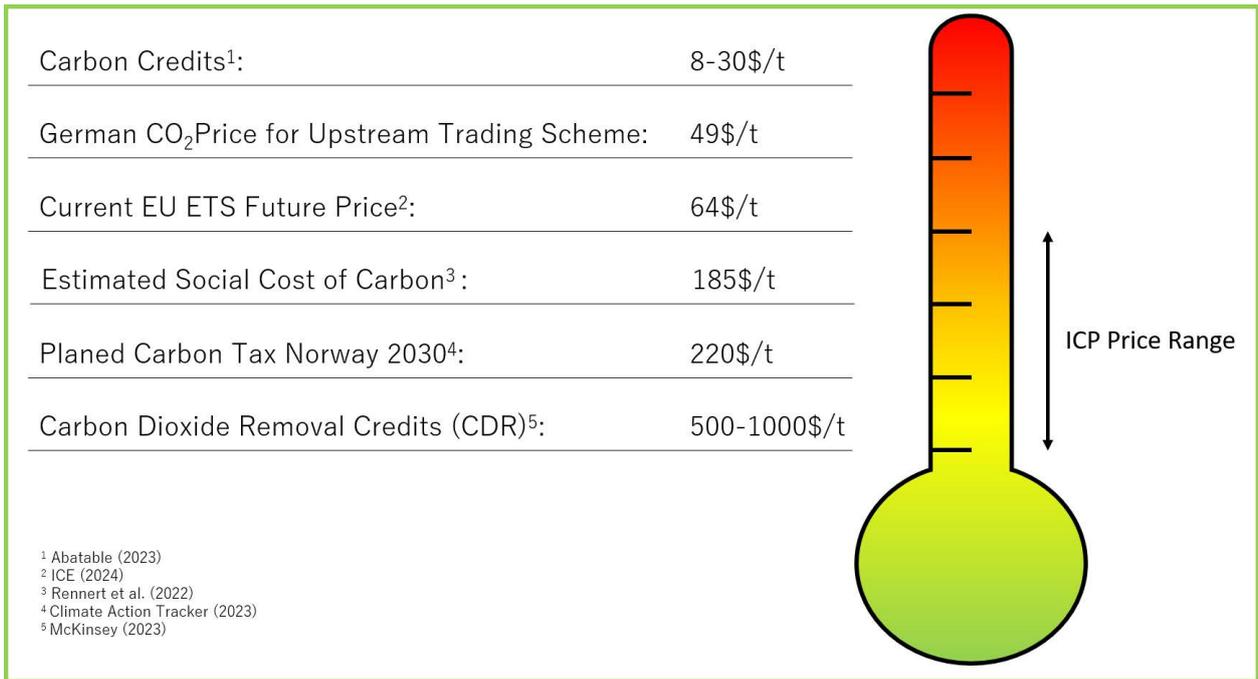


Figure 16 Setting Internal Carbon Price

Today not many regulatory carbon pricing instruments are pricing emissions beyond 100 EUR/t (ICAP 2024). In comparison to the negative external effects resulting from emissions, it must be noted that today’s pricing does not yet align with the true costs as suggested by climate scientists (PCT 2022). These prices are thus far not stimulating major shifts by market participants. The current trend does not yet indicate increases that would already support the 1.5°C target. However, virtually all OECD countries have initiated corresponding instruments. The first carbon tax was introduced in 1990, and the number of carbon pricing instruments has since steadily increased, with almost 70 currently in operation (World Bank 2023). It is likely that policymakers will introduce measures to increase prices in order to ensure that their Nationally Determined Contributions (NDCs) related to the Paris Accord are sufficiently met. This, in turn, has implications for risk management in the real estate sector, as delayed countermeasures could lead to even higher prices in the long run.

In contrast to the ICP concept, a symbolic or shadow carbon pricing does not result in any financial payments. It can be helpful to at least quantify the risk that might arise for employees once new policy instruments will come to play. Similar to regulatory carbon prices, budgeting carbon emissions for certain areas and continuously decreasing the budgets can help to visualize the required changes.

Introducing an ICP emphasizes a company’s leadership in ESG, as these measures go far beyond regulatory requirements.

No Emission Reduction Without Tenant Engagement

Since many properties are owned by real estate companies and occupied by third parties, tenant-landlord collaboration is taking center stage in the race to Net Zero in the real estate sector. Tenant engagement is key to decarbonizing properties, and there are several measures that can be introduced. The following ones were provided by our interview partners:

- Introducing Green Leases which incorporates Green Fit-Out & Operation Schemes and CSR collaboration.
- Establishing frequent interactions between property management representatives and tenants' facility managers, mostly on a day-to-day basis, addressing ESG-related topics and potential savings.
- Advising tenants on how to adhere to e.g., BREEAM Plus Interiors.
- Designating vendors on specific matters that are likely to interest tenants – e.g., re-using office furniture, upcycling materials abandoned during fit-outs or moving premises.
- Instituting quarterly engagement of selected tenants on company offerings, short tour of behind the scenes facilities (e.g., Central Buildings Management Systems), and networking sessions.
- Holding CSR events / activities involving both employees and tenant employees.
- Engaging with tenants' sustainability reporting team to ensure data exchange related to ESG-KPIs (both ways).
- Introducing procurement of Green Energy as far as possible for common and tenant space.
- Installing smart meters and also displays for tenants to visualize the energy consumption level on a day to day basis. This will increase transparency and increase motivation for more reduction.

Increased adoption of Green Leases or, at the very least, inclusion of Green Lease Clauses in conventional contracts, is evidently a key driver to promote decarbonization results and effectively engage with tenants to reduce their consumption. According to insights from our interview partners, the uptake of such contracts has remained low in many regions. In addition to transparently communicating the benefits to tenants, it is advisable to tie the variable remuneration of asset managers to the number of successfully signed Green Leases.

Swire Properties provided a best-practice approach for tenant engagement:

**Best Practice: Swire Properties’
“Green Performance Pledge”: Changing
the Sustainability Game for Office Tenants**



As part of the company’s Sustainable Development (SD) 2030 Strategy and longstanding commitment to fighting climate change, Swire Properties has launched the Green Performance Pledge (“GPP”), a performance-based agreement that acts as a blueprint for facilitating landlord-tenant partnerships to contribute to a more sustainable world. Building on the basic premise of a green lease, the GPP covers the entire tenancy cycle in the two core areas of fit-out, and operation, which focuses on creating a significant impact in terms of energy, water, and waste reduction. This performance-based programme gives users access to a multitude of ‘green’ digital tools while enhancing tenant-landlord collaboration. For new tenants fitting-out their premises, or for existing tenants planning a renovation, the GPP includes a comprehensive set of ‘SD Fit-out Technical Guidelines’. Featuring user-friendly templates, the Guidelines cover office design as well as a validation and recognition system to improve energy and water efficiency, reduce waste and enhance employee wellness. Under the operations portion, tenants can make use of an array of tools and support available to guide them to operate in a more sustainable way. Highlights include performance benchmarking and action planning, data sharing, tailored SD offerings such as free energy audits and smart water meters, access to pioneering green technologies including Hong Kong’s first smart waste reduction programme, networking opportunities, and recognition for exemplary environmental performance. Since the launch of the GPP in August 2021, Swire Properties has seen the GPP flourish in both Hong Kong and the Chinese Mainland in 2023, with participation spanning diverse sectors, including but not limited to finance, luxury, legal and information technology:

- In Hong Kong, 87 tenants signed up from Taikoo Place, Pacific Place and Citygate Outlets, a sixfold increase compared with the GPP pilot year in 2021.
- Over 90% of new tenants at Two Taikoo Place, the Company’s newest triple Grade A office tower, have signed up to the GPP.
- In the Chinese Mainland, we received positive feedback from the GPP pilot with 15 tenants from Taikoo Hui Guangzhou, HKRI Taikoo Hui and INDIGO participating.
- Swire Properties aims to engage 50% of office tenants in Hong Kong and the Chinese Mainland by 2025.

The exemplary measures in this chapter should be regularly reviewed and adjusted to the particular needs of the company in order to comply with the defined Net Zero commitment.

Many investors implementing ambitious measures to reduce emissions at property level perceived “Scale” as posing a challenge to ensuring sufficient returns. They stated that community projects encompassing whole streets or districts are in that sense more promising, but would require support by local authorities and politicians (which is often missing).

After having read through this section, organizations should be able to derive answers for the following questions:

1. Do we have the appropriate overview and awareness of the full range of potential measures that could support decarbonization at the asset, portfolio and company levels? Which measures best serve our strategy and goals? Do we have a full understanding of the cost-benefit analysis associated with the defined activities?
2. What is our roadmap for action over time? Are we focusing enough on no-regret actions?
3. Are we incentivizing employees to reduce carbon emissions, or does our current compensation system encourage the opposite? Is our workforce adequately trained for the tasks at hand?
4. Are we already focusing on Life-Cycle-Assessment (LCA) and Low Carbon Construction, or is our business model still concentrated on green field developments and conventional construction?
5. Do we have renovation quotes in place, and are there internal minimum efficiency standards?
6. Are we using renewable energy in whichever areas possible?
7. Should we introduce an Internal Carbon Price (ICP) to steer our investments in the right direction? If so, what is the right carbon price over time?
8. Are we engaging tenants and our supply chain and, trying to reduce their carbon emissions?
9. Are we pushing towards signing more green leases and engaging on ESG topics with our tenants sufficiently?

7.6 Monitoring and Reporting your Net Zero Commitment

When long-term targets are defined in a transition plan, they must be credible, and the year-on-year accomplishments must be tracked and disclosed to stakeholders. Similarly, ensuring proactive identification, monitoring, and assessment of climate risks must be accomplished. The underlying data and methodologies to verify the results and/or identify and price risks must be made transparent.

Tracking the progress of the implemented measures is, therefore, an essential but challenging task. This presupposes that the company is able to collect all the data required at a high level of granularity. Data must be material, comparable, complete, timely, and consistent in order for it to be relevant for investment and voting decisions going forward, as well as for complying with disclosure obligations.

Stay Credible and Track Progress

Measurement/Controlling: To loosely quote economist Peter Drucker: 'You can't improve what you don't measure'. Keeping track of the achieved progress and adjusting the strategy accordingly is thus crucial for allocating resources to the right measures. This can be a significant challenge in the real estate industry due to the complexities of landlord-tenant relationships and data privacy laws. As a result, this process requires special management attention.

Reporting/Disclosure: ESG related disclosure must be consistent, comparable and reliable. External reporting can be beneficial for achieving Net Zero. This step serves for both self-reflection and communication of progress to stakeholders.

All these steps must be evaluated continuously and adjusted accordingly to counter to possible shortcomings. Research on embodied and operational carbon emissions in the real estate industry has been intensified in recent years and reliable benchmarks have become more widely available (e.g. Ramboll 2022, CRREM 2022). In addition, guidance notes and standards are increasingly available. For example, since 2011, the [EPRA sBPR guidelines](#), have been supporting LRE companies in meeting their Net Zero objectives by directing the disclosure of ESG KPIs relevant to the LRE sector on companies' annual reports. The guidelines also recommend disclosing these KPIs differentiating among the various asset classes and countries to improve transparency and facilitate effective comparison. EPRA sBPR data has been collected since inception and is accessible to all EPRA members, allowing tracking of the companies' evolution in terms of sustainability reporting. Additionally, EPRA follows an annual review process to recognize and reward entities that demonstrate outstanding performance in their sustainability reporting, monitoring their performance and encouraging their improvement.

A collection of the most relevant data points and resulting KPIs is displayed in the following table:

ESG Indicator	Relevant Data	KPI
Energy consumption (Electricity, Fossil Fuels, District Heating etc.)	<ul style="list-style-type: none"> Energy intensity Primary and final energy consumption 	<ul style="list-style-type: none"> kWh/m² kWh/m²/year kWh/person/year
Energy efficiency rating	<ul style="list-style-type: none"> Energy Performance Certificate (EPC) Other energy ratings Energetic retrofit since last rating 	<ul style="list-style-type: none"> Energy label (A-G) Expiry data of EPC kWh/m² Yes/no, if yes specify rating
Labels and certificates	<ul style="list-style-type: none"> Green building certification schemes National-level certificates BREEAM, LEED, Well etc. 	<ul style="list-style-type: none"> Level of certificate Date of issue/ expiry
Renewable Energy Production onsite	<ul style="list-style-type: none"> Method of energy generation Quantity and specification of renewable energy systems (e.g. solar panels, heat pumps, biomass, wind turbines) Heating source Usage 	<ul style="list-style-type: none"> kWh/m²/year % of primary/ final energy demand met by renewable energy produced onsite % use onsite versus % delivered back to the grid
Greenhouse Gas Emissions (direct and indirect)	<ul style="list-style-type: none"> CO₂ emissions, both excluding and including F-gases Based on real energy consumption 	<ul style="list-style-type: none"> kgCO₂e/m²/year
Emissions Pathway Analysis	<ul style="list-style-type: none"> CRREM pathway analysis Other pathway analysis Benchmark curve 	<ul style="list-style-type: none"> Data of Standing Alignment with pathway Decarbonization CapEx and updated stranding dates
Location Characteristics	<ul style="list-style-type: none"> Local Infrastructure Connectivity 	<ul style="list-style-type: none"> Amenities in and around the building Walkability score Surrounding Buildings Proximity to public transport
Landlord-Tenant Relationship	<ul style="list-style-type: none"> Tenant activity Rental contract types Green leases in place 	<ul style="list-style-type: none"> Description of current tenants Contracts and/or green leases in place
Material Use	<ul style="list-style-type: none"> Materials used for construction/ renovation 	<ul style="list-style-type: none"> % of material by total weight/ Volume/ Value % of material certified for sustainability qualities
Carbon Footprint	<ul style="list-style-type: none"> Embodied Carbon after construction activity 	<ul style="list-style-type: none"> t/CO₂e LCA

Figure 17 Relevant KPIs on building level, also refer to RICS 2023 and EPRA 2017

To be able to comply with a Net Zero Commitment, companies must evaluate their assets and determine the GHG/ CO₂e emissions of their portfolio. Once whole-building level data, has been collected, tools like CRREM enable easy and quick assessments, and reveal whether or not the asset is in line with a 1.5°C decarbonization pathways or any other Net Zero commitment.

Collecting the complete emissions data on the asset level should be one of the key steps for steering a company towards Net Zero. Due to the complexity of data structures and the challenges related to data gathering the following aspects appear to be important for investors and asset managers:

- Tenant engagement to ensure whole building data coverage.
- Advanced software supporting data gathering, calculating relevant KPIs for controlling and reporting as well as further analytical steps to allocate CapEx budgets²¹.
- Installation of smart meters.

ESG leaders, such as *Cromwell European REIT*, have increased their energy data coverage by floor area across their entire portfolio to over 90%. ESG considerations and environmental due diligence in particular are included at a very early stage in the due diligence process for new acquisitions, with 100% screened in 2022. Already in 2021, a "Sustainability Committee" was established at board level to ensure oversight and governance of all implementation steps in the transition. In addition to voluntary changes, the more stringent regulatory framework for decarbonization and sustainability reporting in Singapore was a key driver for the upcoming changes.

In most cases, market participants will have to deal with incomplete data. Several innovative software providers such as the 30+ CRREM-license partners have specialized in finding robust solutions to close these data gaps and optimize data management. Since ESG KPIs are required for internal controlling, external benchmarking, and multiple external reporting obligations, all the investors and asset managers whom we spoke to were in the process of enhancing their IT-landscape, and favoring holistic ESG dashboards. According to our interview partners the most used software solutions to tackle decarbonization were *BuildingMinds*, *Deepki*, *Measurabl* and *SIERA* (by Evora Global)²². All of these products also incorporate the CRREM pathways making it easy for investors to evaluate their Paris-alignment.

METABUILD offers one example on how to deal with incomplete data:

21 For advanced software solutions see e.g. CRREM (license) partners at <https://www.crrem.eu/partners/>

22 Please note that we are not displaying a ranking, but list in alphabetical order.

**Best Practice METABUILD:
Dealing with incomplete data**



A common situation in most real estate portfolios: Incomplete asset data

In most real estate portfolios, CRREM assessment teams are facing incomplete data availability. This mainly concerns 1) missing energy consumption data, 2) insufficient area calculations and 3) missing data on possible retrofit measures. Inaccurate data sets potentially lead to incorrect assessments of stranding risks and thus to wrong asset valuations. The effects of incomplete data and possible solutions to overcome data gaps are discussed below.

a) Missing energy consumption data

According to the CRREM methodology, a total balance of energy consumption and carbon emissions is required. This includes all energy sources and tenant electricity consumption. Particularly in commercial rental properties, energy bills are often unavailable or only available for certain tenants. The common approach for dealing with energy consumption gaps is using sector-average benchmark values. Benchmark values, however, do not reflect specifics of the asset, such as shading effects of neighbouring buildings or the impact of building envelope properties.

b) Insufficient area calculations

Using the correct floor area reference has a significant impact on any kind of benchmarking. The total energy consumption of the asset is broken down to a per square meter level which is then assessed using the CRREM methodology. Therefore, the larger the floor area reference, the lower the energy and carbon intensity per square meter. The CRREM reference guideline has very clear requirements regarding the floor area references. The relevant floor area for CRREM stranding risk assessments is the IPMS2 excluding parking. For many assets, only the lettable floor area is available. The common approach to handle this inaccuracy is to use a (sector-average) multiplier to approximate the IPMS2 area. This could possibly also lead to deviations if the real area turns out to be different.

c) Missing data on possible retrofit measures

The CRREM methodology includes the possibility for an assessment of retrofit measures. The calculation is based on a user input of a retrofit year, an expected CapEx, an energy efficiency improvement percentage as well as an embodied carbon figures. In most cases, tangible and asset-specific costs are only available after a detailed technical due diligence. Using benchmark and sector averages for retrofit measures is the second best solution, since it does not consider the specifics of a given building (building envelope, HVAC systems, etc.).

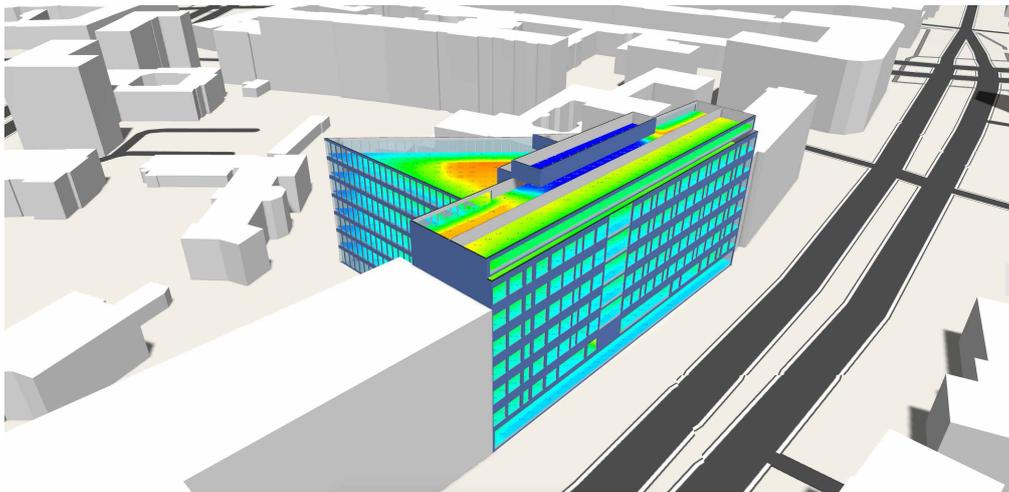
Simulation-based approach for handling incomplete data

In order to deal with incomplete asset data, Metabuild has introduced a novel simulation-based approach. Using a 3D simulation model as a Digital Twin of the asset, high-resolution dynamic year-round simulations are performed, considering site-specific hourly weather data and building use information. The process analyses the current situation of the building as well as retrofit scenarios and outputs detailed KPIs for CRREM risk assessments, such as

- Asset energy intensity (in kWh/m²/a)
- Asset carbon intensity (in kg/m²/a)

- IPMS2 area (in m²)
- Stranding year assessment
- CapEx for retrofit scenarios (in EUR)
- Energy efficiency improvements (in %)
- Carbon emissions improvement (in %)
- Embodied carbon of retrofit scenarios (in tons CO₂)

The simulation results provide valuable insights beyond the requirements of a CRREM risk assessment. Examples include assessments of primary energy demand, electricity demand, yields from renewable sources, OpEx, life cycle cost and indoor comfort (thermal comfort, daylight comfort and air quality).



Ultimately, companies need a platform that enables automated data collection. Our interview partners clearly stated that digitalization is progressing rapidly, and investments are often made to strengthen ESG-related IT capacity. Internal controlling and monitoring can help to identify action gaps and operating areas lagging behind the defined decarbonization targets and milestones that have been defined. We identified several key aspects based on our interviews:

- **Standardized controlling and monitoring:** Relevant KPIs and external reporting requirements are increasingly well defined and industry standards are well understood. We still noted that with regard to details some market participants underestimate the effort needed to clearly derive valid and reliable data and KPIs²³ clearly.

23 For details on GHG aligned and correct data gathering and reporting related to carbon counting see <https://www.crrem.eu/accounting-and-reporting-of-ghg-emissions/>

- **Scope:** The reporting must cover all Scopes (Scope 1, 2, 3). Even if the company has no measures in place yet to tackle Scope 3 emission, information ought to still be collected.
- **Accountability, verification and integrity:** We clearly noted that quality checks, external assurance, integrity and data quality are on the agenda of many market participants ([UN 2022](#)). Especially due to more regulatory requirements the need for verified data is rising.
- **Frequency:** Annual data is obviously a necessity. However, with the increasing prevalence of digitalization and smart meters, many market participants are now monitoring their assets and portfolios for ESG data on a more frequent basis – some even leveraging daily changes in emission factors, energy prices, etc. We recommend conducting, at the very least, quarterly risk inventories for strategic, compliance, financial, and operational risks, as well as the fulfillment of mitigation plans.

Transparency is the Key for External Reporting

When it comes to external reporting, transparency and standardization are indispensable. According to *Evora Global* the main drivers of ESG disclosure are investor pressure, regulation, reputation, internal governance and access to capital. ([Evora Global 2023](#)). The global survey conducted by Evora, underlines the important role of investors demands, when it comes to sustainability reporting. Aligning the company's reporting structure with well-known climate-related reporting frameworks is key to meeting investors' informational needs.

An overview of the most relevant ones is displayed in [Figure 18](#).

TCFD is the most widely accepted and incorporated framework in many of the other standards. For example, recently, the International Sustainability Standards Board (ISSB) recently released their climate risk-related disclosure standards, which are also based on the TCFD recommendations. Accordingly the U.S. Securities and Exchange Commission (SEC), the UK Parliament, the European Commission and the International Sustainability Standards Board (ISSB) aligned their sustainability disclosure standards (broadly) with the TCFD ([SEC 2024](#), [ISSB 2024](#), [European Parliament 2023](#)). With regard to carbon counting and reporting the Greenhouse Gas Protocol ('GHG Protocol') is broadly accepted and incorporated into all leading sustainability reporting frameworks, including the TCFD, Value Reporting Foundation, GRI, CDP, CDSB, IFRS, ESRS and SEC's Climate Disclosure Rules. GRESB/PCAF and CRREM jointly released a Sec-

tor Guidance aligned with the GHG protocol for the real estate sectors operational use phase (CRREM 2023).

Reporting Standard	Publishing Entity	Area of Application	Description
GRI Standards	Global Reporting Initiative	Global	<ul style="list-style-type: none"> • Enable any organization – large or small, private or public – to understand and report on their impacts on the economy, environment and people in a comparable and credible way. • Covers all areas of ESG.
CDP	CDP Global	Global	<ul style="list-style-type: none"> • Global environmental disclosure system • Established as 'Carbon Disclosure Project'
TCFD Recommendations	Task Force on Climate Related Financial Disclosure	Global	<ul style="list-style-type: none"> • Basis for many climate related reporting standards • Disbanded, monitoring transferred to IFRS
ISSB IFRS S1 and S2	International Financial Reporting Standards Foundation (IFRS)	Global	<ul style="list-style-type: none"> • Covers all areas of ESG • Closely aligned to TCFD • Emission Scopes 1-3
ESRS	European Financial Reporting Advisory Group (EFRAG)	EU	<ul style="list-style-type: none"> • Covers all areas of ESG • Double materiality • Regulatory reporting standard compulsory in combination with CSRD • Emission Scopes 1-3
US SEC Rule	United States Securities and Exchange Commission (SEC)	US	<ul style="list-style-type: none"> • Single Climate Standard • Emission Scopes 1 and 2 from 2026 • Initially, only large listed entities
CDSB Framework	Climate Disclosure Standards Board	Global	<ul style="list-style-type: none"> • framework for reporting environment and social information with the same rigor as financial information • Standards discontinued and supporting IFRS & ISSB
SASB Standards	Value Reporting Foundation	Global	<ul style="list-style-type: none"> • Discontinued and consolidated into IFRS Foundation
The Global GHG Accounting & Reporting Standard	Partnership for Carbon Accounting Financials	Global	<ul style="list-style-type: none"> • open-source global GHG accounting standard for financial institutions • Standard for financed emissions, facilitated emissions and insurance-associated emissions
Sustainability Best Practice Recommendations Guidelines (sBPR)	EPRA	Europe	<ul style="list-style-type: none"> • Developed for Listed Real Estate Companies in Europe • Guidelines for disclosure of sustainability performance
INREV Sustainability Guidelines	INREV	Europe	<ul style="list-style-type: none"> • Developed for Non-Listed Real Estate Companies
Mandatory ESG Reporting Singapore (name tba.)	Accounting and Corporate Regulatory Authority (ACRA) and Singapore Exchange Regulation (SGX RegCo)	Singapore	<ul style="list-style-type: none"> • Starting from 2025 • Still under development • Includes scope 3 and value chain from 2026 • Aligned with ISSB and ESRS

Figure 18 Overview Reporting Standards

Recently, there have been increasing calls from financial institutions and banking associations for more rigorous disclosure of climate risk as well as associated moves to accomplish this. For example, the Basel Committee on Banking Supervision (BCBS) is currently developing a standard for climate risk disclosure.

Adhering to standards of a recognized reporting initiative is a way of signaling aspirations for full transparency. Real estate companies should also engage an auditing firm to conduct a third-party evaluation of all gathered data points on energy consumption, carbon output and decarbonization along their value chain (Scope 1, 2, 3). Assurance should be aligned to the reporting tables of the leading initiatives mentioned previously.

Conflicting Standards and Reporting Requirements

Stakeholders struggle with reporting requirements and conflicting standards: ‘Too many frameworks’, ‘constant changes in requirements’, ‘data sharing and collection issues’, ‘different regulations in each country’, ‘pressure is exploding’, etc. were typical comments we received in our interviews. While in some countries regulation supported companies’ decarbonization efforts, in others (e.g. Texas/US) it effectively hindered any progress. There was a clear call for more global alignment and for strong, long-term, predictable and stable regulatory frameworks. In particular, global approaches that offer a solid scientific basis and are supported by many other organizations (such as CRREM) were favored by market participants.

Ensure Impacts on Balance Sheet Are Sufficiently Addressed

For CFOs, it is not only important to assess the mere expenditures of property-related measures in order to enhance energy efficiency and factor them into CapEx planning; the linkages of potential write-downs and other impacts that climate risk might have on real estate companies’ balance sheets must also be sufficiently evaluated. Financial statements are already affected by climate risks, due to insufficient measures or the absence of comprehensive transition plans. In such situations potential impairments of assets (ISA 36) and fair value measurement (IFRS 16) ultimately result in write downs and losses (IFRS 2019).

Similarly, unexpected regulatory shifts could result in the devaluation of assets characterized by high GHG intensity. Additionally, it is vital to recognize the potential necessity for recalibrating growth rates at both the asset and portfolio level, and crucial for determining the achievable terminal value of a given asset. At the asset level, certain properties might front accelerated economic obsolescence, prompting a need to shorten their economic lifespans accordingly.

All of these adjustments may become an imperative in response to a better understanding of climate risk impacts on business models.

After implementing these steps, companies should be able to answer the following questions:

1. Did we sufficiently define the KPIs relevant for our Net Zero pledge? Are we aware of the data needs and potential gaps that ought to be closed? Are we tracking data coverage and quality in this respect?
2. Are we verifying the data we collect?
3. What standards are relevant for disclosure of GHG data and is our data collection aligned to these requirements?
4. Is our data collection process sufficiently automated and do we have a clear roadmap for more digitalization and smart metering in this respect?
5. Are we gathering data at a frequency which aligns with the potential for automated data collection capabilities?
6. Does our emission disclosure cover all relevant scopes (1–3)? Are systematic collection methods established for all emissions scopes?
7. How do we reflect our findings in our balance sheet? What will happen with asset values over time if we do not ensure sufficient investment to tackle climate risk today?

Definitions

Absolute Zero	When no greenhouse gas emissions are attributable to an actor's activities across all scopes. (UNFCCC 2024)
Science-Based/ Paris-Aligned	Target is aligned with what the latest climate science deems necessary to meet the goals of the Paris Agreement – limiting global warming to well-below 2°C above preindustrial levels and pursuing efforts to limit warming to 1.5°C, with no or low overshoot. (Oxford 2024)
Net Zero whole-life carbon building	A building where the sum total of all building-related greenhouse gas emissions over a building's life cycle, both operational and embodied, is minimized; meets local carbon, energy and water targets; and, with residual offsets, equals zero. (WLCN 2021)
Net Zero carbon operational energy building	A 'Net Zero Carbon - Operational Energy' asset is one where no fossil fuels are used, all energy use has been minimized, meets the local energy use target (e.g. kWh/m ² /a) and all energy use is generated on- or off- site using renewables that demonstrate additionality. Any residual direct or indirect emissions from energy generation and distribution are 'offset'. (WLCN 2021)
Nearly Zero Emission Building (NZEB)	Nearly zero-emission building (NZEB) means a building that has a very high energy performance, while the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby. (European Commission 2024)
Zero carbon ready building	A zero-carbon-ready building is highly energy-efficient and either uses renewable energy directly, or uses an energy supply (e.g. electricity or district heating) that will be fully decarbonized by 2050. (IEA 2022)

Race to Net Zero

Race to Zero is a global campaign rallying non-state actors – including companies, cities, regions, financial, educational, and healthcare institutions – to take rigorous and immediate action to halve global emissions by 2030 and deliver a healthier, fairer, Net zero world. Race to Zero considers individual actors to have reached a state of net zero when:
An actor reduces its emissions following science-based pathways, with any remaining GHG emissions attributable to that actor being fully neutralized by like-for-like removals (e.g. permanent removals for fossil carbon emissions) exclusively claimed by that actor, either within the value chain or through purchase of valid offset credits. (Race To Resilience 2024)

Further collection of Net Zero related definitions: R2Z Lexicon; Oxford Net Zero

Recommended Literature

- EPRA (2017): EPRA Sustainability Best Practices Recommendations Guidelines
- IIGCC (2024): Net Zero Investment Framework 2.0
- IIGCC (2023): Net Zero Stewardship Toolkit
- WBCSD (2022): If we act today, we can halve the emissions of the built environment by 2030
- ULI (2022): Climate Migration and Real Estate Investment Literature
- CDP (2021): Are companies being transparent in their transition?
- MSCI (2021): Breaking down corporate Net Zero climate targets
- MSCI (2022): Breaking down real estate Net-Zero targets
- EPRA/ CRREM (2022): How to manage your Net Zero targets with CRREM
- ULI (2021): Transition risk assessment – guidelines for consultation
- UNEPFI (2023): The climate risk landscape
- UNEPFI (2024): Target Setting Protocol Fourth Edition
- BBP (2022): Net Zero Carbon Pathway Framework
- ULI (2022): Nature positive and Net Zero: The ecology of real estate
- GRESB/ PCAF/ CRREM (2023): Accounting and reporting of GHG emissions from real estate operations
- Hines (2022): Embodied carbon reduction guide
- RICS (2023): Whole life carbon assessment for the built environment
- Bienert, Sven; Kuhlwein, Hunter; Schmidt, Yannick; Gloria, Benedikt; Agbayir, Berivan (2023): Embodied Carbon of Retrofits. Ensuring the Ecological Payback of Energetic Retrofits

References

- alstria. (2024). alstria's Low Carbon Design Prinzipien: Edition 2024.
- Anderson, N. (2019). IFRS® Standards and climate-related disclosures.
- Armstrong McKay, D. I., Staal, A., Abrams, J. F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S. E., Rockström, J., & Lenton, T. M. (2022). Exceeding 1.5°C global warming could trigger multiple climate tipping points.
- Berrone, P., Fosfuri, A., & Gelabert, L. (2017). Does Greenwashing Pay Off? Understanding the Relationship Between Environmental Actions and Environmental Legitimacy.
- Bienert, S [S.]. (2016). Metastudie: Nachhaltigkeit contra Rendite? Die Implikationen nachhaltigen Wirtschaftens für offene Immobilienfonds am Beispiel der Deka Immobilien Investment GmbH und der WestInvest GmbH.
- Bienert, S [S.]. (2021). Klimaneutralität vermieteter Mehrfamilienhäuser – aber wie?
- Bienert, S [Sven], Kuhlwein, H [Hunter], Schmidt, Y., Gloria, B., & Agbayir, B. (2023). Embodied Carbon of Retrofits: Ensuring the ecological payback of energetic retrofits.
- Bingler, J., Senni, C., Fixler, D., & Schimanski, T. (2023). Net Zero Transition Plans: Red Flag Indicators to Assess Inconsistencies and Greenwashing.
- Boland, B., Levy, C., Palter, R., & Stephens, D. (2022). Climate risk and the opportunity for real estate: Real-estate leaders should revalue assets, decarbonize, and create new business opportunities. Here's how.
- Building Emissions Reduction And Disclosure Ordinance, 2023.
- BPIE. (2022). EU Buildings Climate Tracker: Methodology and Introduction of Building Decarbonisation Indicators and their Results.
- CDP. (2022a). Are companies being transparent in their transition? 2021 climate transition plan disclosure.
- CDP. (2022b). Missing the Mark: 2022 analysis of global CDP temperature ratings.
- CDP. (2023a). Are Companies Developing Credible Transition Plans? Disclosure to key climate transition-focused indicators in CDP's 2022 Climate Change Questionnaire.
- CDP. (2023b). CDP Technical Note: Reporting on Climate Transition Plans.
- Center for International Environmental Law. (2022). Trillion-Dollar Pension Fund TIAA Faces Climate-Washing Complaint Brought by Hundreds of Professors and Scientists. <https://www.ciel.org/news/tiaa-faces-climate-washing-complaint-brought-by-academics/>
- Chye, M. (2023). Asia's carbon pricing and emission trading systems. <https://www.reuters.com/markets/carbon/asias-carbon-pricing-emission-trading-systems-2023-03-31/>
- Local Law 97, 2019.
- Clayton, J., Devaney, S., & Sayce, S. and van de Wetering, J. (2021). Climate Risk and Commercial Property Values: a review and analysis of the literature.

Climate Action 100+. (2023). Progress Update 2023.

Climate Action Tracker. (2024). The CAT Thermometer.
<https://climateactiontracker.org/global/cat-thermometer/>

Cort, T., Gilbert, K., DeCew, S., Goldberg, M., Wilkinson, E., & Fitzgerald, H. (2022). Rising Leaders on Social and Environmental Sustainability.

Dalton, B., & Fuerst F. The 'green value' proposition in real estate: A meta-analysis. In (Original work published 2018)

deJong, M. T., Huluba, G., & Beldad, A. D. (2020). Different Shades of Greenwashing: Consumers' Reactions to Environmental Lies, Half-Lies, and Organizations Taking Credit for Following Legal Obligations.

Devine, A., Kok, N., & Wang, C. (2023). Sustainability Disclosure and Financial Performance: The Case of Private and Public Real Estate.

Directorate-General for Environment. (2023). Proposal for a Directive on Green Claims.

Emissions Gap Report 2023: Broken Record – Temperatures hit new highs, yet world fails to cut emissions (again). (2023). United Nations Environment Programme.

EPRA. (2017). EPRA Sustainability Best Practices Recommendations Guidelines: Third version.

Euractiv.com. (2022). Paris and New York join climate litigation against TotalEnergies. <https://www.euractiv.com/section/energy/news/paris-and-new-york-join-climate-litigation-against-totalenergies/>

European Central Bank. (2005). Annual Report 2004.

Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (recast), 2021.

Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting, 2022.

Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC (2023).

Evora Global. (2022). Evora Annual Investor Survey: Report 2022.

Evora Global. (2023). Insights into Real Estate Investment Sustainability (IRIS) Survey 2023: Part 1: Regulation and Disclosure.

UN Expert Group. (2022). Integrity Matters: Net Zero Commitments by businesses, financial institutions, cities and regions.

FCLTGlobal. (2021). FCLT Compass 2021 Report: The Economics of Resilience: Capital Allocation and Investment Horizons during Covid-19.

GFANZ. (2022). Financial Institution Net-zero Transition Plans: Fundamentals, Recommendations, and Guidance.

GREEN. (2022). Results Green Engagement: Listed Real Estate Programm.

GRESB, PCAF, & CRREM. (2023). Accounting and Reporting of GHG Emissions from Real Estate Operations.

Groh, A., Kuhlwein, H [Hunter], & Bienert, S [Sven] (2022). Does Retrofitting Pay Off? An Analysis of German Multifamily Building Data.

Hammond, G. (2022). Industry body warns on property sector's failure to cut emissions.

Hines. (2022). Embodied Carbon Reduction Guide.

ICAP. (2024). ICAP ETS Map. <https://icapcarbonaction.com/en/ets>

IEA. (2022). Technology and Innovation Pathways for Zero-carbon-ready Buildings by 2030: A strategic vision from the IEA Technology Collaboration Programmes.

IEA. (2023). Net Zero Roadmap: A Global Pathway to Keep the 1.5°C Goal in Reach.

IEA. (2024). Policies Database. <https://www.iea.org/policies?sector%5B0%5D=Buildings&year=desc>

IIGCC. (2021). Net Zero Investment Framework 1.5°C: Implementation Guide.

IIGCC. (2023). Investor Expectations of Corporate Transition Plans: From A to Zero.

The Investor Agenda. (2022). 2022 Global Investor Statement to Governments on the Climate Crisis.

JLL (Ed.). (2021). Decarbonizing the Built Environment: Ambitions, commitments and actions.

Kelly, J., Markiewicz, K., Miglani, K., & Torres, P. (2022). Retrofitting Buildings to be Future-Fit: The journey to decarbonization.

Knight Frank. (2023). ESG Property Investor Survey.

KPMG (Ed.). (2022). KPMG 2022 CEO Outlook: Growth strategies in turbulent times.

LaSalle. (2023). What is the value of green? Looking at the evidence linking sustainability and real estate outcomes.

Leutner, S., Gloria, B., & Bienert, S [Sven] (2024). Is there a green discount in commercial real estate lending?

Mark Carney. (2015). Breaking the Tragedy of the Horizon: climate change and financial stability.

Masson-Delmotte, V., Zhai, P., Pirani, A., Connors, S. L., Péan, C., Berger, S., Caud, N., Chen, Y., Goldfarb, L., Gomis, M. I., Huang, M., Leitzell, K., Lonnoy, E., Matthews, J., Maycock, T. K., Waterfield, T., Yelekçi, O., Yu R., & Zhou, B. (2021). Climate Change 2021: The Physical Science Basis. Working Group I Contribution to the IPCC Sixth Assessment Report.

Masson-Delmotte, V., Zhai, P., Pörtner, O., Skea, J., Shukla, P. R., Pirani, A., Moufouma-Okia, W., Péan, C., Pidcock, R., Connors, S. L., Matthews, J., Chen, Y., Zhou, X., Gomis, M. I., Lonnoy, E., Maycock, T. K., Tignor, M., & Waterfield, T. (2018). Global Warming of 1.5°C: An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.

McKinsey. (2021). Solving the net-zero equation: Nine requirements for a more orderly transition.

MSCI. (2022). Breaking Down Real Estate Net-Zero Targets.

MSCI. (2023). 2023 Trends to Watch in Real Assets: Five critical insights to help you navigate challenges ahead. <https://www.msci.com/research-and-insights/2023-trends-to-watch-in-real-assets>

Net Zero Tracker. (2024). Data Explorer. <https://zerotracker.net/>

NewClimate Institute, & Carbon Market Watch. (2023). Corporate Climate Responsibility Monitor 2023.

Office of Energy Efficiency & Renewable Energy. (2024). Building Performance Standards. <https://www.energycodes.gov/BPS>

Oliver Wydman, & CDP (Eds.). (2023). Stepping Up: Strengthening Europe's corporate climate transition.

OliverWyman, & CDP. (2023). Stepping up: Strengthening Europe's corporate climate transition.

PCT. (2023). Carbon Pricing Metrics: Analyzing Existing Tools and Databases of Platform for Collaboration on Tax (PCT) Partners.

PWC, & ULI. (2024). Emergin Trends in Real Estate: Getting fit for purpose.

Ramboll. (2023). Embodied Carbon in the Building Sector. <https://c.ramboll.com/lets-reduce-embodied-carbon>

Rennert, K., Errickson, F., Prest, B. C., Rennels, L., Newell, R. G., Pizer, W., Kingdon, C., Wingenroth, J., Cooke, R., Parthum, B., Smith, D., Cromar, K., Diaz, D., Moore, F. C., Müller, U. K., Plevin, R. J., Raftery, A. E., Ševčíková, H., Sheets, H., . . . Anthoff, D. (2022). Comprehensive evidence implies a higher social cost of CO₂.

RICS. (2022). Sustainability and ESG in commercial property valuation and strategic advice.

RICS. (2023a). Decarbonising the built environment: policy reform reports for key market governments.

RICS. (2023b). Whole life carbon assessment for the built environment.

Ripple, W. J., Wolf, C., Gregg, J. W., Rockström, J., Newsome, T. M., Law, B. E., Marques, L., Lenton, T. M., Xu, C., Huq, S., Simons, L., & King, D. A. (2023). The 2023 state of the climate report: Entering uncharted territory.

Romanello, M., Di Napoli, C., Drummond, P., Green, C., Kennard, H., Lampard, P., Scamman, D., Arnell, N., Ayeb-Karlsson, S., Ford, L. B., Belesova, K., Bowen, K., Cai, W., Callaghan, M., Campbell-Lendrum, D., Chambers, J., van Daalen, K. R., Dalin, C., Dasandi, N., . . . Costello, A. (2022). The 2022 report of the Lancet Countdown on health and climate change: health at the mercy of fossil fuels.

Sato, M., Gostlow, G., Higham, C., Setzer, J., & Venmans, F. (2023). Impacts of climate litigation on firm value.

Science Based Targets. (2024). SBTi Corporate Net-Zero Standard.

Securities and Exchange Commission. (2022). The Enhancement and Standardization of Climate-Related Disclosures for Investors.

Storbeck, O. (2023). DWS closes in on settlement over greenwashing scandal. <https://www.ft.com/content/38be4231-21cf-46e3-8b6a-88a4e923f01c>

TCFD. (2023). Task Force on Climate-related Financial Disclosures: 2023 Status Report.

- UBS. (2023). Green Premium: Study of New York and London Real Estate finds strong evidence for a 'green premium'.
- UKGBC. (2023). Carbon Offsetting and Pricing.
- UN. (2022). Credibility and Accountability of Net-Zero Emissions Commitments of Non-State Entities. <https://www.un.org/en/climatechange/high-level-expert-group>
- UNEPFI. (2023). UN-convened Net-Zero Asset Owner Alliance: Target Setting Protocol.
- UNEPFI, & NZBA. (2023). Climate Target Setting for Real Estate Sector Financing.
- UNFCCC. (2022). Race to Zero Lexicon.
- United Nations. For a livable climate: Net-zero commitments must be back by credible action. <https://www.un.org/en/climatechange/net-zero-coalition>
- United Nations. (2015). Paris Agreement.
- United Nations Environment Programme. 2021 Global Status Report for Buildings and Construction: Towards a Zero-emission, Efficient and Resilient Buildings and Construction Sector.
- Van Lanschot Kempen. (2022, December 15). Real Estate ESG Analysis: Only 10% of listed real estate companies have set targets for net zero carbon emissions by 2050 [Press release].
- Walker, K., & Wan, F. (2012). The Harm of Symbolic Actions and Green-Washing: Corporate Actions and Communications on Environmental Performance and Their Financial Implications.
- Wein, J., Bienert, S [S.], Spanner, M., Kuhlwein, H [H.], Huber, V., Künzle, C., Ulterino, M., Charlin, D., & Arshad, M. (2022). Managing Transition Risk in Real Estate: Aligning to the Paris Climate Accord.
- WLCN, LETI, & RIBA. (2021). Improving Consistency in Whole Life Carbon Assessment and Reporting.
- Woetzel, J., Dickon, P., Samandari, H., Engel, H., Krishnan, M., Boland, B., & Powis, C. (2020). Climate risk and response: Physical hazards and socioeconomic impacts.
- World Bank. (2023). State and Trends of Carbon Pricing 2023.
- World Economic Forum. (2022a). The global risks report 2022: 17th Edition.
- World Economic Forum. (2022b). Winning the Race to Net Zero: The CEO Guide to Climate Advantage.
- World Green Building Council. (2022). EU Policy Whole Life Carbon Roadmap: #buildinglife.
- WorldGBC. (2023). Ahead of the Wave: Financing the transition to a decarbonised built environment.
- Xu, C., Kohler, T. A., Lenton, T. M., Svenning, J.-C., & Scheffer, M. (2020). Future of the human climate niche.



EPRA
EUROPEAN PUBLIC
REAL ESTATE ASSOCIATION

Supported by

