MAPPING ESG

A LANDSCAPE REVIEW OF CERTIFICATIONS, REPORTING FRAMEWORKS AND PRACTICES

PRI Principles for Responsible Investment

INREV

ULI Urban Land Institute

ABOUT ULI

The Urban Land Institute is a global, member-driven organisation comprising more than 46,000 real estate and urban development professionals dedicated to advancing the Institute's mission of shaping the future of the built environment for transformative impact in communities worldwide.

ULI's interdisciplinary membership represents all aspects of the industry, including developers, property owners, investors, architects, urban planners, public officials, real estate brokers, appraisers, attorneys, engineers, financiers, and academics.

Established in 1936, the Institute has a presence in the Americas, Europe, and Asia Pacific regions, with members in 80 countries. ULI has been active in Europe since the early 1990s and today we have almost 5,000 members and 15 national councils.

The extraordinary impact that ULI makes on land use decision making is based on its members sharing expertise on a variety of factors affecting the built environment, including urbanisation, demographic and population changes, new economic drivers, technology advancements, and environmental concerns. Drawing on the work of its members, the Institute recognises and shares best practices in urban design and development for the benefit of communities around the globe.

ABOUT INREV

INREV, the European Association for Investors in Non-Listed Real Estate Vehicles, was launched in May 2003 as a forum for institutional investors and other participants in the growing non-listed real estate vehicles sector. The association represents and reflects an industry with a total value of €2.8 trillion and INREV members deliver €385 billion of stimulus to the real economy of Europe.

INREV has over 490 members which include 124 of the largest institutional investors as well as 40 of the 50 largest real estate investment managers, plus banks and advisors across Europe and elsewhere.

The non-profit association is focused on increasing the transparency and accessibility of non-listed vehicles, promoting professionalism and best practice, and sharing knowledge. It is based in Amsterdam, the Netherlands. www.inrev.org

ABOUT PRI

The Principles for Responsible Investment (PRI) is the world's leading proponent of responsible investment. It works:

- to understand the investment implications of environmental, social and governance (ESG) factors;
- to support its international network of investor signatories in incorporating these factors into their investment and ownership decisions.

The PRI acts in the long-term interests:

- of its signatories;
- of the financial markets and economies in which they operate;
- and ultimately of the environment and society as a whole.

The PRI is truly independent. It encourages investors to use responsible investment to enhance returns and better manage risks, but does not operate for its own profit; it engages with global policymakers but is not associated with any government; it is supported by, but not part of, the United Nations.

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Steering Committee

Justin Travlos - AXA IM

Cristina Garcia-Peri - Azora

Nehla Krir - BNP Paribas

Mark Swarts - Bouwinvest

Nicolette Klein Bog - Bouwinvest

Tsilah Burman - CBRE IM

Pietro Belli - Generali

Fabio Crisanziani - Generali

Elodie Jeanne - Ivanhoé Cambridge

Stéphane Villemain - Ivanhoé Cambridge

Regan Smith - Manulife Investment Management

Maarten Jennen - PGGM

Blakely Jarrett - ULI

Sarah Adams - Vert Asset Management

Authors

Christiane Conrads, Global Real Estate ESG Leader - PwC

Thomas Veith, Global Real Estate Leader - PwC

Sandra Horst, Specialist - PwC

Anthony Comyn, Manager - PwC

Celine Jakob, Senior Associate - PwC

Luisa Hermann, Senior Associate - PwC

INREV Project Staff

Bahar Yay Celik, Professional Standards Manager

Lonneke Löwik, CEO

PRI Project Staff

Hani Legris, Specialist Real Estate

Simon Whistler, Head of Real Assets

Adams Koshy, Senior Specialist, Sustainability Reporting

ULI Project Staff

Lisette van Doorn, CEO Europe

Sophie Chick, Vice President, Research & Advisory Services, Europe

Simon Chinn, Vice President, Research & Advisory Services, Europe

Joey Udrea, Manager, Research & Advisory Services, Europe

Tevan Lee, Associate, Research and Advisory Services, Europe

Alex Eitler, Associate, Research and Advisory Services, Europe

James A. Mulligan, Senior Editor

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FOREWORD

Environmental and social challenges present arguably the greatest risks facing our societies globally. From climate change, biodiversity loss and water scarcity, to social inequity in various forms, the scale of the challenge is immense. The built environment has an important contribution to make in addressing these social and environmental challenges, with buildings responsible for nearly 40% of global GHG emissions.[1] In addition, half of energy and raw material consumption and one-third of total water consumption can be attributed to the construction and real estate industry.[2,3]

Alongside the development of the industry over the past two decades, we have seen a growing importance of sustainability, initially focused on governance and environmental issues, and social impact gaining ground in recent years.

In the absence of regulation and uniform definitions, the industry started to develop its own frameworks, standards and certifications. Initially focused on building level with sustainability certifications assessing building construction standards, this was soon followed by ESG benchmarks such as GRESB and industry standards such as EPRA and INREV.

In the meantime, following on from the global financial crisis and increasing concerns related to climate change, regulations across different countries and regions have stepped up and more are expected soon.

As a result, it has become increasingly difficult to navigate the various mandatory regulations and voluntary standards, especially when taking into consideration the bespoke requests from investors on top of the standards. For real estate capital markets to operate effectively and sustainably and enhance the speed at which progress is made to mitigate climate change and adjust to the challenges, greater clarity is needed to ensure information is 'decision useful' for investors.

In response to these challenges, ULI, INREV and PRI in close collaboration with the project steering committee, and supported by PwC, embarked on a journey to map and compare the most important global ESG related regulations, standards and certifications and assess each of them in relation to the E, S and G components.

Through member and industry knowledge sharing and best practices, this report offers guidance on how to potentially navigate and use existing regulations, standards and certifications in the field of ESG.

We hope this report will enhance the understanding of the current landscape and future direction of ESG related reporting standards and regulations and building certifications, supporting individual managers and investors in setting an ESG strategy in close alignment with their company's business strategy.

INREV, ULI, PRI

EXECUTIVE SUMMARY

In recent years, the global real estate sector has seen a tidal wave of new developments in assessing ESG criteria and using ESG factors to evaluate how far they have advanced with sustainability performance issues. While substantial progress has been made, the sector is not resting on its laurels and is fully aware of how much further there is still to go. As we approach the end of the first quarter of the 21st century, are we nearing the 'end of the beginning' for ESG in real estate?

Over the last 10 years the avalanche of new ESG reporting requirements applicable to real estate has presented a significant challenge. Keeping up has not been easy, even for the most ambitious organisations with the greatest resources to allocate to the area. In addition, there are different views on what must be prioritised, disclosed, against which criteria, for what purpose and whether commitments will stand up to scrutiny. However, consensus is building.

Despite an increasingly challenging geopolitical context, ESG considerations continue to remain a top priority as we look ahead. The 2023 ULI/PwC *Emerging Trends in Real Estate* report concluded: 'Environment and sustainability strategies are key priorities for most industry leaders for 2023 — as they have been for some time — and climate risk is widely acknowledged as the biggest challenge facing real estate over the next 20 years.'

If the real estate sector of the future is to truly operate within the confines of sustainable development and deliver on the Paris Agreement-aligned net zero targets, it must 'cut through the noise'. Collaboration across all stakeholders will continue to be critical in achieving this. This study, prepared jointly by the Urban Land Institute (ULI), the European Association for Investors in Non-Listed Real Estate Vehicles (INREV), and Principles for Responsible Investment (PRI), and carried out by PricewaterhouseCoopers (PwC), with the support of a range of leading industry experts, aims to contribute to this collaborative effort.

Following an extensive mapping exercise and numerous interviews with industry experts, the report provides a snapshot of the ESG reporting standards most relevant to the sector. This study examines the purpose of the different ESG requirements and the different intended users of the information. It explores how the requirements overlap and where there may be an opportunity to condense the ESG reporting burden. The study also offers suggestions for best practice in ESG reporting across the various case studies included.

While the detailed study is set out in the rest of the report, 10 key findings are summarised below at a high level:

1. The evolving ESG regulatory and reporting landscape is complex and can be overwhelming. The sector must work together to successfully navigate the road ahead. Collaboration and a balance between 'quality' and 'quantity' should be the focus.

2. It is important to understand the purpose of the different ESG frameworks and standards and the intended user of the information: there is no one-size-fits-all standard. Although different standards will continue to exist in the future due to their different purpose and stakeholder needs, we anticipate that there will be further consolidation and alignment of standards which have an overlapping purpose.

3. We have identified five main categories of ESG frameworks and standards which are fundamental to the integration of ESG across the sector:

    a. Core corporate standards
    b. Thematic reporting standards
    c. Sustainability regulation related requirements
    d. Real estate industry specific reporting standards and benchmarking
    e. Principle-based commitments

4. The materiality approach defines the main characteristics of the ESG standards. While some standards have a focus on 'financial materiality', others on 'impact materiality', there are also standards having both a financial and impact materiality purpose, a so-called 'double materiality' approach.

5. Credible data (especially environmental and scope 1–3 greenhouse gas (GHG) emissions data) is fundamental to 'science-based metrics and targets' across multiple disclosure requirements ('you can't manage what you can't measure'). In the absence of primary ESG data, third-party ESG ratings can be helpful, but it is important to understand the limitations of third-party ESG ratings.

6. Building certifications can also complement a successful ESG strategy, however as the regulatory landscape evolves, building certifications are feeling the pressure of staying ahead of regulation to retain their relevance. Following the Paris Agreement targets set and subsequent introduction of regulation across different regions, countries and cities, focus is shifting quickly to actual sustainability performance of a building. Some building certifications focus on actual operational performance, while others continue to focus on theoretical or modeled performance, along with other attributes of sustainable building construction, health and wellness, and other sustainability goals. Whilst a common definition of a green building is still missing, regulation plays a key role in assessing alignment with climate targets.

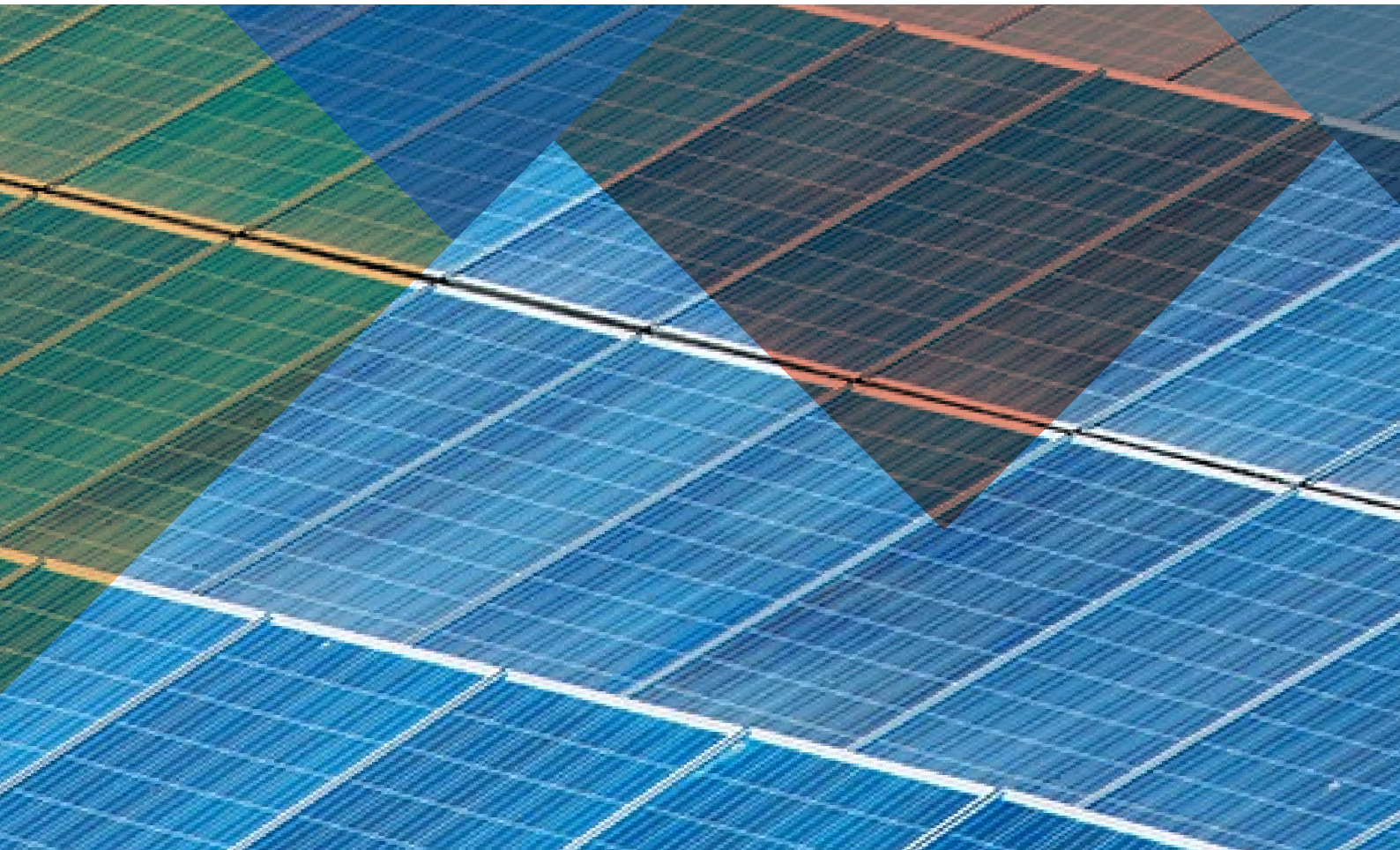
7. Certain social targets are more difficult to measure as they are based on norms and values, but legislation and regulation is increasing worldwide to harmonise social standards for organisations and their supply chains.

8. Good governance is fundamental to effective implementation and a high level of global alignment is based on existing corporate governance requirements.

9. It is important to determine what is within an organisation's control. For areas outside an organisation's control, best practice for engagement with the wider real estate 'ecosystem' should be followed (e.g. collaboration between landlord and tenant where possible).

10. For the sustainability strategy to be successful, the leadership must focus resources on the ESG frameworks and standards most relevant to stakeholders and engage the entire organisation to minimise risk and maximise impact.

1. INTRODUCTION



1. INTRODUCTION

1.1 ESG and the transformation of the global real estate sector

As the real estate sector grew in the early 2000s, so did the importance of the term 'sustainability' in the real estate industry and in society. There was no uniform definition, nor were there any overarching standards or mandatory regulations. The industry faced the challenge of making sustainability measurable. In the absence of official regulations, it was up to investors to drive the issue forward and embed it in the industry through various initiatives. The initial focus was on the central object of the real estate sector: the building. Green building certification systems have emerged over the past decades to primarily assess a building's environmental factors and energy use in build or in use. Recently, certifications focusing on social factors have been introduced to the market.

To date the industry has used a number of approaches to ESG and sustainability, with varying levels of ambition and sophistication depending on the investor, the asset class, the tenant, and their respective geographic region. To respond the need for sustainability reporting, standards and benchmarks were developed 'by the industry, for the industry', such as INREV, EPRA, GRESB.

In parallel to the initiatives developed in the real estate sector, the regulatory landscape has also evolved globally, as figure 1 shows.

Europe is currently considered a leader in creating governance structures especially in the field of sustainable finance, but other regions are quickly catching up. Singapore's Green Taxonomy is scheduled to be introduced in 2023 and Singapore's Green Plan in 2030.

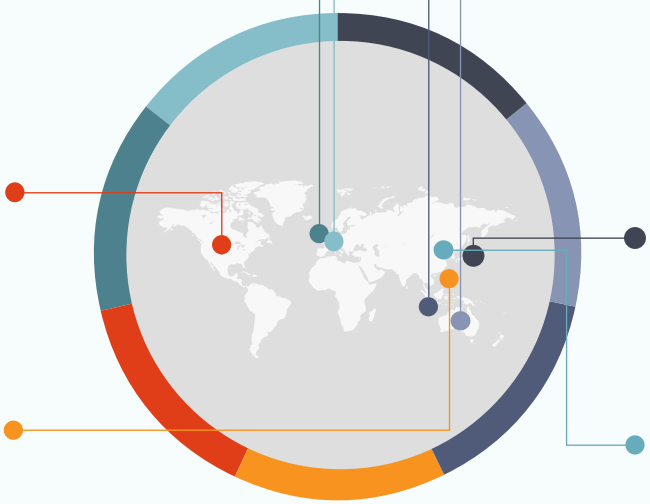
Figure 1: ESG in an international context

Europe
- Strong focus on governance (e.g. EU-Taxonomy, CSRD, SFRD)
- Adaption of Paris Agreement & Agenda 2030
- DNSH & Minimum safeguards as fundamental principles

United Kingdom
- UK ESG regulations similar to EU requirements
- Introduction of Greening Finance Roadmap (e.g. green taxonomy, disclosure regulations)
- Focus on creating transparency & prevent greenwashing

United States
- Strong focus on climate change mitigation & higher environmental standards (Biden administration)
- Large scale renewable energies projects (solar & wind)
- Development of ESG requirements & disclosure obligations (SEC oversight)

Asia Pacific (overall)
- Prioritisation of environmental & net zero carbon aspects
- Access to investment opportunities & capital requires strong ESG record (due to Polycrisis)
- Western capital flows increase ESG demands on Asian-Pacific real estate market



Singapore
- Development of environmental taxonomy with real estate defined as 1/3 sectors with huge environmental impact
- ESG measures focus on biodiversity & vertical agriculture

Australia
- Focus on decarbonisation of building stock & expansion of renewable energy infrastructure
- Intense use of PV solar systems enables the Australian real estate market to become one of the most carbon emission friendly markets globally
- Social aspects are seen as an investment target (differing to EU approach with minimum safeguards)

Japan
- Relatively few mandatory requirements for compliance with ESG criteria
- Focus consists largely of voluntary guidelines and initiatives
- Zero net carbon emissions, & the transition to a circular economy is one of the main focus points

People's Republic of China
- CERDS Introduction of a voluntary disclosure regulation regarding ESG criteria for companies
- Focus on domestic market & strongly oriented towards chinese laws and goals (e.g. common prosperity)
- Issued guidelines on ESG reporting in 2008 by the Shanghai Stock Exchange & Shenzhen Stock Exchange

The European Green Deal announced in 2019 sets binding accounting standards and rules for sustainable finance in the EU aiming to steer capital markets towards fulfilling the UN Sustainable Development Goals (SDGs) and the Paris Agreement. A cornerstone of these new regulations is the prevention of 'greenwashing'. As demonstrated by the raid[4] of an international bank and asset manager in 2022 over greenwashing allegations, scrutiny of this area continues to rise. Australian 'super funds' have recently come under scrutiny by the Australian Securities and Investments Commission[5] for greenwashing, with the first fine imposed on a listed Australian energy company. [6]

In addition, the European Central Bank conducts annual economy-wide climate stress tests, which lead to the conclusion that 'climate change […] represents a major source of systemic risk' for the financial sector. [7]

Historically, sustainability disclosures were made in accordance with voluntary corporate reporting standards or 'must disclose' commitments such as the UK Stewardship Codes or PRI, which are specific for investment managers and asset owners. With the advent of extensive mandatory disclosures, the market is pushing for global alignment of data standards and definitions. This is to reduce the operational reporting burden, but more importantly to define the data that is relevant for driving change.

There continues to be much debate about how integrating ESG in decision making processes can positively or negatively affect financial returns. However, ESG will increasingly affect all stakeholders across the entire sector in one way or another in the coming years.

To align real estate related capital flows with the net zero target of the Paris Agreement and manage climate-related risks, decision-useful, reliable, and comparable data is required. This applies not only to climate-related risks (e.g., physical risks and transition risks such as exposure to future carbon taxes/pricing), but to all ESG – environmental, social and governance – risks. In addition, the availability of reliable data is necessary for the development of effective sustainability strategies, the prevention of 'greenwashing' and the creation of transparency regarding ESG risks.[8]

Overall, given the current market movement away from 'marketing ESG' to 'proving ESG performance', companies must focus on the efficient collection, standardisation, and reporting of ESG data at the fund/portfolio level. Real estate organisations and funds face the challenge of finding a solution that enables data preparation and presentation that meets the diverse information needs of their stakeholders. Furthermore clarification over reporting requirements, sector-specific metrics and technological innovations are increasingly important.

The sector is currently in the midst of a storm of 'old' reporting standards and certifications, a rapidly evolving landscape of ESG regulations and a flood of data requests from investors and disclosure requirements from the regulators. This is a perfect time to take a closer look at what ESG standards, regulations, and requirements for ESG reporting currently exist, what is to come, and what developments are likely in the real estate industry.

1.2 Purpose of the report

The report helps readers gain an overview of the various ESG reporting standards at the corporate and fund/portfolio levels, as well as building certifications applicable to real estate. The study shines a light on the origin, purpose, and coverage of the ESG standards and certifications most used across the industry.

For each ESG framework or standard considered, the overview and analysis sets out the structure and overall content of the respective standard. This allows the reader to assess the standard's usefulness for making relevant disclosures towards chosen stakeholders in alignment with their organisation's ESG strategy. ESG reporting standards are applicable at the corporate, fund/portfolio, and asset levels and address different ESG requirements. Whilst certain regulatory developments and accounting standards (sustainability-related financial reporting) are applicable to specified regions, most standards have global application.

This report examines the status quo of these ESG reporting standards within the context of global development; however, it is important to note the speed with which the area is evolving and might be subject to changes.

Building certifications are compared in terms of coverage and ESG criteria. The certifications are analysed in relation to their use across ESG reporting standards and regulations.

Ratings, scorings and benchmarking assessments (PRI, GRESB, CDP) are used by a range of stakeholders for different purposes and their application to the real estate industry is considered at a high level in the study.

The operational challenges of applying the various ESG reporting standards and building certifications are explored in five best practice case studies, two of which focus on in-house solutions and three of which address overarching challenges in the industry.

Figure 2: Overview frameworks, standards and certifications

	Corporate	Fund / Portfolio	Asset	
Frameworks and 'Scoring'	- EU Taxonomy - *UK Stewardship Code**	- SFDR - PRI - *GRESB**		
Reporting Standards	- TCFD - GRI - SASB - EPRA - CDP - CDSB - Climate Bonds Initiative	- INREV - NCREIF/ PREA*	- *CRREM (tool)*	
Accounting Standards	- IFRS/ISSB (prototype) - CSRD (proposal)			
Certifications			- LEED - BREEAM - WELL - Fitwel - DGNB - HQE - NABERS (UK + Australia) - Green Star (Australia) - Energy Star - CASBEE - BELS (Japan) - ZEB	- *ILFI LBC** - *IREM** - *RESET** - *PHIUS** - *Green Globes**

**Not covered in the detailed mapping exercise.*

The study fundamentally aims to address two key barriers to accelerating performance against ESG and sustainability criteria across the global real estate sector:

1. The onerous, but necessary ESG regulatory and reporting requirements which do not always drive performance against ESG and sustainability criteria in the way they were intended.

    a. By taking a closer look at the most widely applicable ESG frameworks and standards for the industry, chapter 2 aims to provide an overview on the common approaches and differences.

    b. Chapter 4 considers the range of building certificates and ESG data challenges which could feed into the wider ESG frameworks and standards.

2. The need for comparability and standardisation across ESG requirements to allow investors to make efficient real estate capital allocation decisions.

    a. Chapter 3 aims to compare where different ESG requirements (within the scope of the detailed mapping exercise) cover similar ESG criteria (and where they do not) to help the sector jointly tackle this second barrier.

    b. The wide range of ESG ratings and scorings (and their limitations) are considered at a high level within the context of addressing this second barrier in chapter 5.

To overcome these two barriers, real estate organisations need to have clear ESG strategies and establish the necessary governance structures to implement them and report on progress. This is explored further across the case studies.

1.3 Scope of the study

The scope for the study was determined by independent sustainability experts of a globally leading audit and advisory firm (PwC), the sponsors (ULI, INREV, and PRI), and the project steering committee composed of representatives of leading companies from the real estate investment and asset management sector.

The key global investment regions were determined to be the EU, UK, USA, Canada, Hong Kong, Singapore, Japan, and Australia.

The most used ESG-related reporting standards and building certifications were identified for each of the regions in scope. Statistics on the use of a reporting standard or building certification are included in the individual profiles, as provided by the issuing organisations. A condition for being included in the study was sufficient public access to the information required for the purpose of the study and that comparability of the information to other standards.

A further criterion for selecting the ESG reporting standards was direct relevance or applicability for the real estate industry; for example, banking regulations on managing sustainability risks were not included as they only have an indirect effect on real estate enterprises.

The detailed methodology for mapping the reporting standards and building certifications as well as the case studies is included in the relevant sections of the study.

The ESG frameworks and standards as well as the certifications and ratings considered within the scope of the study are not an exhaustive list. While the study aims to provide a holistic view of the evolving ESG landscape for real estate, ESG requirements and regions outside the requirements identified (as most commonly applicable across the industry) are outside the study's scope. Additional specialised studies may be required to consider these out-of-scope ESG requirements and regions.

In addition, given the fast-moving nature of the different ESG requirements, further work may be required to update the analysis as the different ESG requirements develop over time.

> "To overcome the main ESG barriers, real estate organisations need to have clear ESG strategies and establish the necessary governance structures to implement them and report on progress."

1.4 Limitations of the study

Readers need to understand the limitations and challenges regarding the scope and methodology of this study. Due to the breadth of ESG reporting requirements included (as applicable to real estate), many of the requirements and standards are not directly comparable. As a result, this leads to challenges in attempting to compare 'apples and pears' as opposed to 'apples and apples'.

The study is intended to provide a holistic overview of the purpose and thematic coverage of the different standards to help real estate organisations navigate the evolving landscape. However, while thematic overlap can be identified, the extent to which requirements overlap precisely is limited due to the different purpose of the respective standards. It is important the study is therefore read within this context. In addition, the extent to which general recommendations can be made is limited, as this depends on the nature of the real estate organisation, its stakeholders, and the specific purpose and application of the relevant standards.

The categories identified for the mapping exercise were selected in order to compare the different standards to the extent possible. However, it should also be noted that the respective standards have different structures (e.g., different total number of requirements/questions, or multiple requirements in one question). In addition, requirements may cover multiple thematic categories. For the methodology adopted in the mapping exercise, one requirement has been assigned to one category to then compare the proportional composition to the extent possible (e.g., the percentage of requirements across E, S, and G subcategories). It is important the reader understands this methodology cannot be an 'exact science' and leaves room for interpretation.

2. REPORTING FRAMEWORKS AND STANDARDS

2. REPORTING FRAMEWORKS AND STANDARDS

2.1 Status quo of the regulatory framework

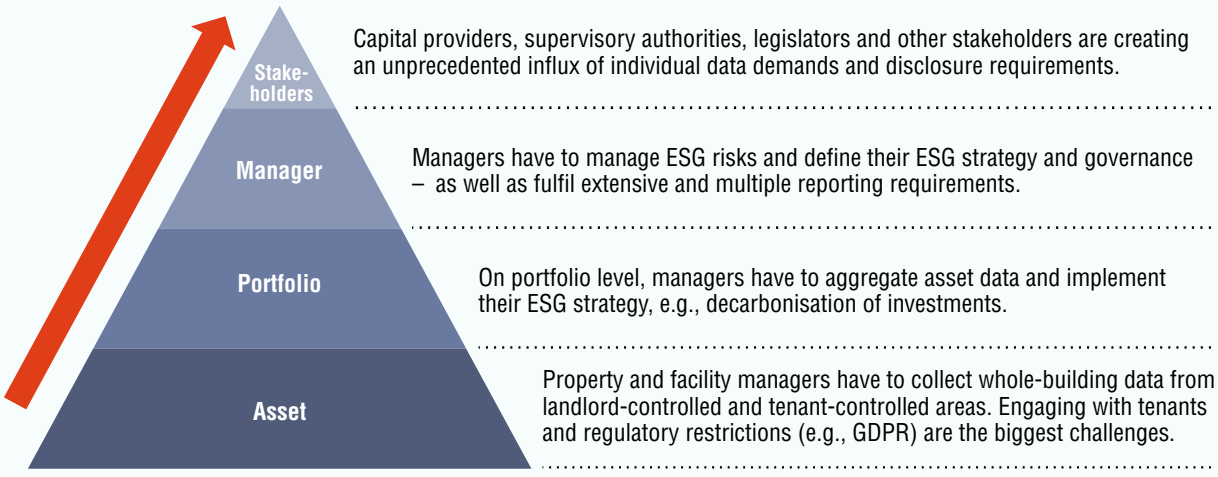
As outlined in the introduction, the development of voluntary ESG reporting standards is now being overtaken by sustainability-related regulatory, financial reporting and disclosure requirements. These developments in corporate and investor reporting are taking place at regional level, e.g., EU regulations including the EU Taxonomy, SFDR and CSRD, as well as globally, e.g., the IFRS S1/S2 financial reporting standards. A clear distinction must be made between these developments, as they create different requirements for the various stakeholders. It is expected that with time, greater global alignment may arise between the EU initiatives and other regional regulations, such as the SEC[9] reporting.

Previously, ambitious investor expectations required a demonstration of commitment to sustainability by becoming a signatory of voluntary standards, such as the UN Global Compact, the PRI, or the UK Stewardship Code. Being a signatory of these principle-based standards was often treated as an exclusion criterion by investors. Thematic standards such as the CDP or Science-Based Targets initiative (SBTi) complemented the governance aspects to align with climate-related strategies.

With the advent of mandatory disclosures, a shift has taken place from commitment to sustainability to data management and measurement, highlighting transparency on the status of ESG strategies for real estate organisations. The complexity and scope of the new disclosures under the EU Taxonomy and SFDR has involved all stakeholders – from facility and property managers to asset and fund managers to investors – scrambling to put data collection, data sharing and data consolidation measures in place amidst significant legal uncertainty and unavailability of data. The new requirements also involve implementing governance and risk management processes as the foundation of managing the internal and external impact of sustainability risks. In one of its latest research papers, INREV explored the implications of SFDR for the non-listed real estate investment industry as well as the challenges of complying with SFDR and how it may distort investment needed for real carbon reduction.[10]

Figure 3 shows the journey of ESG data collection and aggregation at asset and fund/portfolio level, to the development of ESG strategy and governance that ultimately needs to be delivered in different forms to the respective stakeholders to satisfy their information needs.

Figure 3: ESG data collection and aggregation



The quality of data is expected to improve over the upcoming years as better methods of estimation develop and the proportion of measured data increases. However, real estate managers are facing the challenges of meeting the new mandatory disclosure requirements in addition to any voluntary standards chosen by an individual organisation – as well as an influx of investor queries. The significant implementation burden and lack of alignment on the exact definition of metrics raises the question of when the data will become sufficiently standardised and meaningful for decision-making purposes – and drive the reallocation of capital to more sustainable investment.

Regulators and issuing bodies have responded to the need for standardisation of data by consolidating some of the voluntary reporting standards for financial reporting. For example, the new International Financial Reporting Standards (IFRS) S1/S2 (exposure drafts) follow a similar structure to the Task Force on Climate-related Financial Disclosures (TCFD) and incorporate elements of the Sustainability Accounting Standards Board (SASB) standards and reference other standards like the Climate Disclosure Standards Board (CDSB). This is expected to foster acceptance of the market. Whilst opinions may currently be divided on what the most meaningful metrics for measuring impact are, the first common operational goal of market participants is to standardise data[11] across all disclosures and then further develop the metrics globally as an industry.

2.2 The different types of standards covering ESG criteria

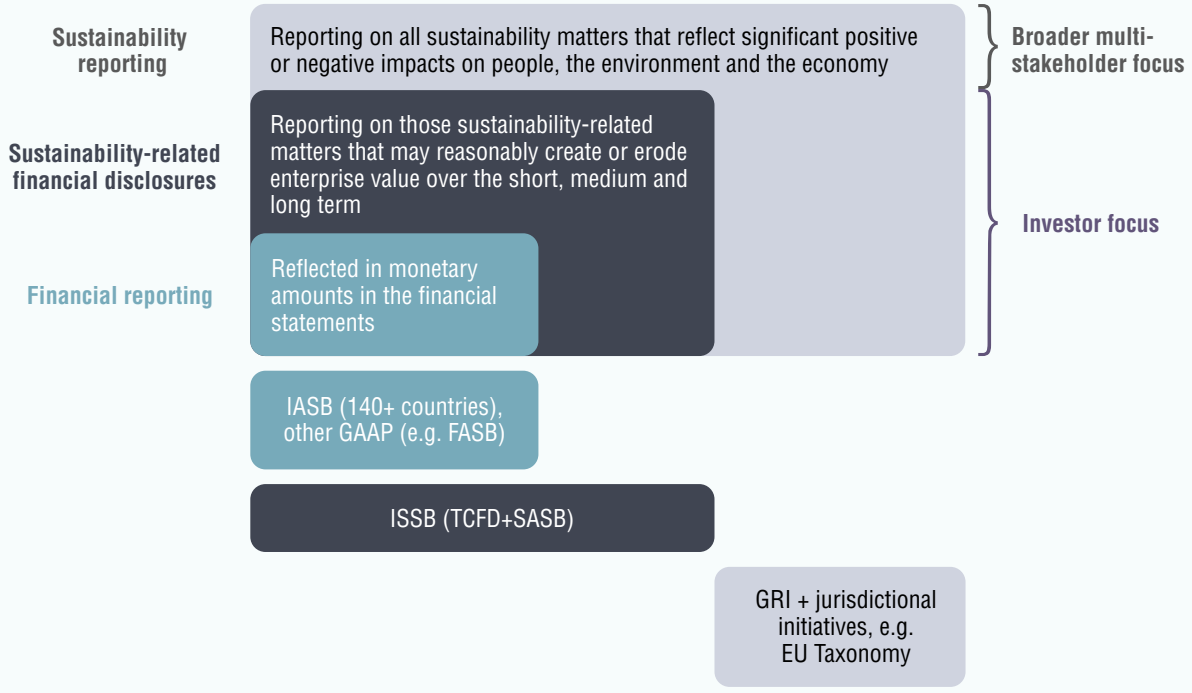
The range of standards covering ESG criteria is very broad and constantly evolving. Based on the current regulatory requirements and legal framework, the real estate industry may fall within the scope of multiple standards.

From a broader perspective, standards can be categorised as 'mandatory' and 'voluntary' standards. Mandatory standards are usually representing legal reporting requirements which are not optional for the organisations under the scope of the standard. On the other hand, there are many voluntary standards that are used within the industry, including the industry-specific standards such as INREV and EPRA. Even if these standards are not legally binding for companies, they are recommended to be applied due to their broad use within the industry. Through uniform use, transparency and comparability can be created within the industry.

Figure 4 provides a comparison of the scope of sustainability reporting for corporate reporting, sustainability-related financial disclosures and traditional financial reporting.

Another broader category is the distinction between 'corporate' and 'portfolio/fund focused' standards. Corporate reporting is by business entities. Under this

Figure 4: Comparison of the scope of the different reporting requirements



SASB (2020): Statement of Intent to Work Together Towards Comprehensive Corporate Reporting; adapted to ISSB Building Blocks (2022)

type of reporting, investors may also be required to report on their entity (rather than any investments they hold) – for example if they are large, listed and/or operating in a specific geography. High-quality corporate reporting is a pre-requisite for meaningful reporting to investors in those corporates. This produces a data 'chain' from corporate reporting to the second type of reporting: investor reporting. Investor reporting requirements refer to reporting on their investment entity as a whole, for a specific asset classes (e.g., real estate) or for a specific financial product/fund. While some standards are related to corporate level reporting (e.g., SASB, EPRA (sBPR)), there are also investment focused standards (e.g., PRI, INREV and SFDR) considering the organisation's overall approach to responsible investment or the sustainability of investment portfolios.

Having these broader categories in mind, we have identified five main categories of ESG frameworks and standards which are fundamental to the integration of ESG across the sector:

a. Core corporate standards
b. Thematic reporting standards
c. Sustainability regulation related requirements
d. Real estate industry specific reporting standards and benchmarking
e. Principle-based commitments

2.2.1 Core corporate ESG standards

Non-financial information[12] or sustainability(-related) reporting is complementary to corporate financial reporting such as the IFRS or national generally accepted accounting principles (GAAPs). Established voluntary standards such as SASB or GRI are being reflected in mandatory reporting standards (e.g., IFRS S1/S2 and CSRD).

The IFRS Foundation completed the consolidation of the Value Reporting Foundation (SASB standards) and the CDSB (Climate Disclosure Standards Board) in 2022 following its commitment at COP26 to develop the IFRS S1/S2. The GRI is providing technical support to EFRAG (European Financial Reporting Advisory Group), which is mandated with undertaking the preparation for the

Figure 5: Core corporate ESG standards

Corporate standard	Short description	Geographical application
SASB (Sustainability Accounting Standards Board)	• discloses sustainability information that is financially material and reasonably likely to affect a company's financial performance • consolidated and became a resource under the ISSB with its industry-based requirements	Global
ISSB (International Sustainability Standards Board)	• published exposure drafts of sustainability reporting standards IFRS S1 (General Requirements for Disclosure of Sustainability-related Financial Information) and IFRS S2 (Climate-related Disclosures), together with an appendix on industry-based disclosure requirements • final standards are expected by end of Q2 2023, as of date of publication	Global
CSRD (Corporate Sustainability Reporting Directive)	• replaces the NFRD (Non-Financial Reporting Directive) • the Directive has been fnalised in November 2022, but the focus of this mapping is on the Draft for proposal CSRD • the European Sustainable Reporting Standards (ESRS) will further specify reporting requirements under the CSRD	EU
GRI (Global Reporting Initiative)	• helps organisations report on their external impacts on the economy, environment and society, including human rights impacts • aims to increase accountability and transparency regarding the company's contribution to sustainable development	Global

European sustainability reporting standards (ESRE), as well as providing comments in the consultation for the IFRS S1/S2 and collaborating with the ISSB on both of their future standard setting developments.

2.2.2 Thematic reporting standards (focusing on climate)

Thematic standards engage the commitment of corporations to reduce their environmental and climate impact through publication and disclosure platforms. They can be sustainability reporting or sustainability-related financial reporting and are on corporate level.

In 2021, ULI published an overview of social value focused certifications, frameworks and tools.[13]

2.2.3 Sustainability-related regulatory requirements

The EU is the global frontrunner in the establishment of sustainable finance regulations. As part of the European Commission's ambition to promote sustainable investment across the EU, several regulatory and policy initiatives were developed in recent months that impact non-listed real estate investing. The EU Taxonomy (corporate level) defines what constitutes activities contributing to environmental objectives and the SFDR (corporate and portfolio level) is a uniform disclosure regime addressing transparency on a financial market participant's sustainability risks and principle adverse impacts of the investments under management. The SFDR which was adopted as part of the EU's 2018 Action Plan on Sustainable Finance has a double-materiality approach, in providing transparency into sustainability-related risks and opportunities as well as sustainability outcomes associated with the investments. The EU Action Plan is based on the UN's 2030 Agenda and Sustainable Development Goals as well as the Paris Agreement. Similar initiatives are being introduced in the UK[14] (with the proposed UK Sustainability Disclosure Requirements and UK Green Taxonomy) and other countries.[15]

2.2.4 European real estate industry reporting standards and benchmarking assessments

Industry-specific sustainability reporting standards have been developed by INREV (non-listed real estate fund

Figure 6: Thematic reporting standards (focusing on climate)

Thematic standard	Short description	Geographical application
TCFD (Task Force on Climate-Related Financial Disclosures)	• founded by the Financial Stability Board • aims to strengthen the stability of the financial system by giving transparency to enterprises' exposure to climate-related risks and opportunities • forms the baseline for many climate-related reporting standards	Global
CDP (formerly Carbon Disclosure Project)	• global disclosure platfom for managing environmental impacts with a focus on climate, water and forest • provides public scoring for all three topics • functions as an incentive for environmental leadership • maintains a comprehensive dataset for corporates, supply chain and cities • designed to address reputational concerns, enhance competitive advantage, identify risks and opportunities and track and benchmark improvement	Global
CDSB (Climate Disclosure Standards Board)	• offers a framework for reporting environmental (climate change and natural capital-related) information in mainstream financial reports • consolidated and referenced within the ISSB	Global
CBI (Climate Bonds Initiative)	• seeks to mobilise global capital for climate action by introducing a Certification Scheme as a labelling scheme for bonds and loans • assets and projects that meet the CBI standards are eligible for certification	Global

Figure 7: Sustainability regulations

Sustainability regulations	Short description	Geographical application
EU Taxonomy	• a common classification of economic activities substantially contributing to environmental objectives, using science-based criteria • purpose is to channel capital flows towards sustainable investments by creating common definitions (classification system), increasing transparency and preventing greenwashing	EU
SFDR (Sustainable Finance Disclosure Regulation)	• sets out requirements on sustainability-related disclosures in the financial services sector, both at entity and product levels. • the requirements distinguish between financial products that have sustainable investment as their objective, those that promote environmental and/or social objectives and all other products	EU

Figure 8: Industry-driven reporting standards

Industry-driven reporting standard	Short description	Geographical application
INREV (European Association for Investors in Non-Listed Real Estate Vehicles)	• provides a reporting framework that meets investors' needs for comparability and transparency of information at vehicle and asset level • provides a coherent framework for ESG reporting in line with annual financial reporting and presents a clear picture from the vehicle's strategy through a set of sustainability reporting disclosures complemented by required and recommended ESG KPIs	EU and Asia Pacific
EPRA (European Public Real Estate Association)	• aims to facilitate a greater understanding of the environmental, social and governance impacts associated with a company's activities, leading to efficiency gains and, ultimately, lower operating costs, social and governance benefits	Europe
GRESB (Formerly known as Global Real Estate Sustainability Benchmark)	• provides actionable and transparent environmental, social and governance data to financial markets • collects, validates, scores, and benchmarks ESG data to provide business intelligence, engagement tools and solutions for the industry	Global
NCREIF PREA Reporting Standards	• The NCREIF PREA Reporting Standards is an industry initiative co-sponsored by the National Council of Real Estate Investment Fiduciaries (NCREIF) and the Pension Real Estate Association (PREA) with a mission to establish and implement information standards for the real estate industry which will facilitate transparency, consistency and informed decision-making.	US

Figure 9: Principle-based commitments

Principle-based commitments	Short description	Geographical application
PRI (Principles for Responsible Investment)	• an investor initiative in partnership with UNEP Finance Initiative and UN Global Compact • the PRI signatories have to report annually on their responsible investment activities to the PRI • the reporting is linked to the 6 Principles and feeds into the PRI Assessment	Global
UK Stewardship Code	• issued by the Financial Reporting Council and aligns with the UK Corporate Governance Code • includes reporting expectations	UK
UN Global Compact	• a longstanding commitment for private enterprises to meet fundamental responsibilities in the areas of human rights, labour, environment and anti-corruption • on asset management and investor level, being a signatory to the UN Global Compact is often a selection criteria for investments • although there are no reporting requirements per se, expectations to describe practical actions that a company has taken/expects to take to implement the UNGC and measurement of outcomes on the targets/performance indicators	Global

level), EPRA (listed real estate equity, corporate level), and GRESB (listed and non-listed real estate and infrastructure funds and assets), respectively. They offer a real estate interpretation of recognised standards such as TCFD or GRI for the real estate industry.

2.2.5 Principle-based commitments

The principle-based commitments, such as PRI, the UK Stewardship Code and UN Global Compact, are for asset owners and asset managers and are aimed at contributing to a more sustainable global financial system. As frontrunners for sustainable finance regulations, they foster ESG integration into investment decisions and stewardship from their signatories. The principles are supported by disclosures.

The PRI Assessment is based on the PRI reporting submitted by signatories. The purpose of the assessment is to demonstrate how the signatory can improve its responsible investment practice and to facilitate learning and development. An individual confidential report provides benchmarking for different asset classes, peers, and regions to the signatory. Whilst it is not designed for comparison with peers, it is often used as such in practice.

2.3 Types of disclosures

To gain an overview of the purpose of standards, the following four main types of disclosures were identified to reflect the different kinds of informational value provided:

Define: a definition included in a standard introducing either a benchmark or a definition of sustainability, classification of sustainable economic activity, or a clear requirement to provide transparency on the disclosing entity's definitions, calculations, and methodologies.

Describe: background or neutral information on the company and its operations to provide wider context (e.g., products, structure, geographical footprint, etc), whether financial products promote environmental or social characteristics or whether assurance has been provided over information.

Manage: information on the governance elements (e.g., strategy, governance, compliance and risk management) to enable the stakeholder to assess the management response to climate and ESG-related impact, risks and opportunities.

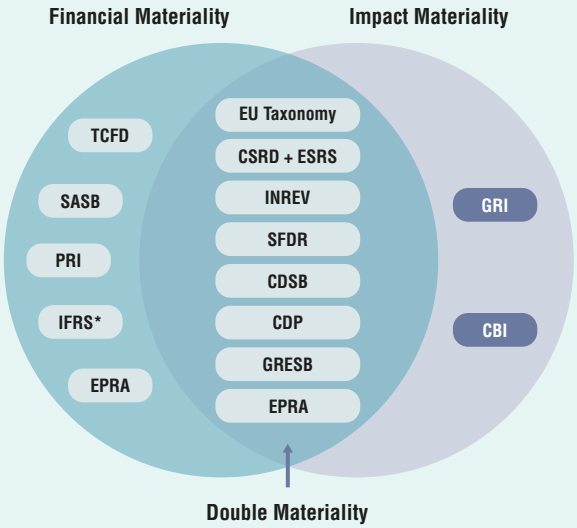
Measure: quantitative data on metrics and targets, science-based impacts or implementation targets (e.g., GHG

Double Materiality

Information is considered 'material' if it could influence the decision-making of stakeholders. The term double materiality combines the two concepts of financial materiality (information needed to understand how sustainability and sustainability risks affect the company financially) and impact materiality (information needed to understand the impact of the company itself on society and the environment) and reflects the understanding of how certain risks and opportunities can **affect not only the value of an enterprise, but also people, the environment, and the economy.** This means that on the one hand, sustainability risks, such as climate change, can negatively affect business models, operations, and financial results (or present opportunities to reduce exposure, through GHG emission reduction, for example). On the other hand, the business model and operations can have a positive or negative impact on the environment and society, such as the climate impact of GHG emissions or the societal impact of improving community infrastructure.

Figure 10 provides an initial overview of the purpose of each standard from a 'single' materiality perspective (financial or impact) or a 'double' materiality perspective. It should be noted however that the classification set out below can be subjective and may therefore vary depending on the point of view. In particular, this framing is not often used for investor focused frameworks, and normally a reference point for corporate standards.

Figure 10: Materiality of the reporting standards and frameworks



**The final version is not published, as of the reporting date.*

emissions in Scope 1/2/3 metric tons CO_2e, total volume of water usage in megaliters etc) to enable the stakeholder to assess the effectiveness of sustainability governance and the materiality of climate and ESG related impact, risks and opportunities.

2.3.1 Deeper look into management and measurement aspects

As outlined in the introduction to this chapter, reporting standards are moving away from governance-focused disclosures that allow an enterprise to be flexible in its interpretation of a standard to measurable, standardised and comparable data disclosures. Both disclosures are equally valuable for understanding how sustainability risks and opportunities affect an investment.

The qualitative information on the governance structure, the ESG strategy, and risk and compliance management systems in place provide insight into how well management understands and responds to sustainability risks and opportunities and how this will affect the business model and future profitability. From a double materiality perspective, it should also demonstrate how the enterprise manages its impact on people, the environment, and the economy. Sufficient evidence is being collected by supervisory authorities and central banks to provide evidence on how, for example, climate risks contribute to the instability of global financial systems. Thus, managing an organisation's carbon footprint addresses a systemic issue through the feedback loop.

To assess the effectiveness of an organisation's management of sustainability risks, quantitative data is required to enable tracking and comparison with peers. Different types of disclosures can be used to measure the carbon footprint or progress of an enterprise.

In the study five different main categories of ESG frameworks and standards (see section 2.2) were analysed to compare their focus on either the way they 'manage' or 'measure' aspects for climate-related topics, that is, standards which have a financial reporting purpose. The results align with the purpose of the standard, for example, the GRI and SASB standards have defined ESG KPIs aimed at measuring certain factors against actual quantitative metrics, similar to the INREV Guidelines where qualitative guidelines are supported with quantitative disclosure KPIs, to the SFDR focusing mainly on how sustainability risks are integrated into the investment process and on providing transparency on how ESG objectives are actually achieved. The quality of data is expected to improve over the upcoming years as the market moves away from estimates to measured data, achieved by the product, as well as principle adverse impact of investments on sustainability issues.

Figure 11 shows the different levels of a company at which quantitative, qualitative, or general data and information must be identified to develop a comprehensive ESG strategy, considering all risks and opportunities.

2.3.2 Different ways to manage and measure

Different types of disclosures are used to provide information to the stakeholders from a certain ESG perspective. Below are examples of the types of disclosures that demonstrate how the 'manage' and 'measure' concepts are put into practice.

1. Implementation targets: SASB uses a range of disclosures that provide transparency on the status of implementation of the SASB-defined operational targets for the real estate industry.

2. Financial metrics: The EU Taxonomy focuses on disclosing the income generated by EU Taxonomy-aligned activities and the investment made into such activities, thus trying to promote capital flows into what is defined as sustainable business activities.

3. Qualitative disclosure: The INREV Guidelines provide a generic framework for non-listed real estate investment vehicles to report on how ESG goals, alongside other business objectives, are part of their overall strategy. It allows the investor to assess how the ESG strategy and objectives of the real estate vehicles are considered through vehicle strategy and implemented at asset plans. This approach allows the investment manager to define its own ESG targets and disclose its performance using the list of ESG KPIs.

4. Science-based ESG metrics: The GRI, as a sustainability reporting standard, includes a range of quantitative science-based metrics that enable the stakeholder to assess and compare the impact of the reporting entity on sustainability risks.

Figure 11: Measuring and managing ESG risks

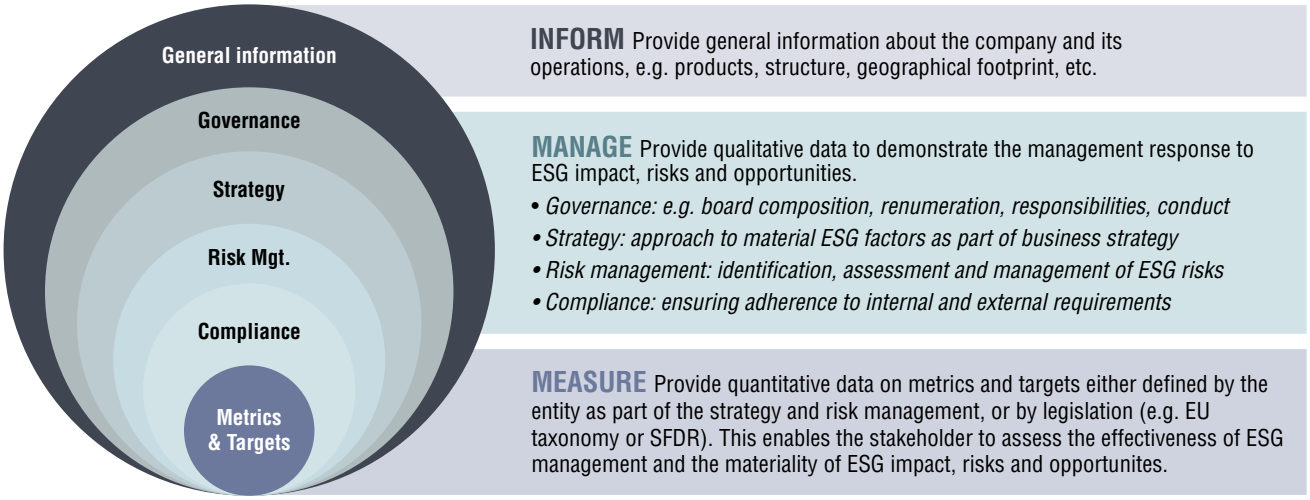


Figure 12 shows examples from each type of disclosure.

Figure 12: Types of management and measurement disclosure

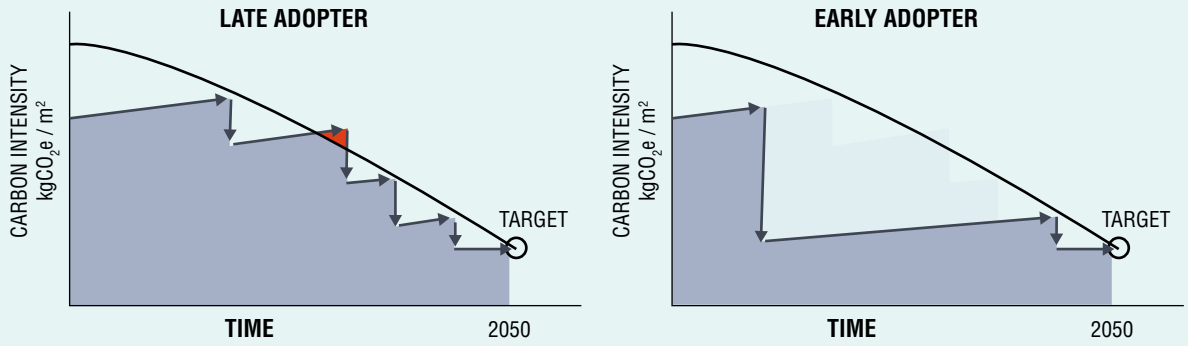
SASB: Implentation targets	**EU Taxonomy:** Financial metrics	**INREV:** ESG strategy and metrics	**GRI:** ESG metrics
Percentage of new leases that contain a cost-recovery clause for resource efficiency-related capital improvements by property subsector. *SASB IF-RE-410a.1.*	Per EUT-aligned activity 1) Turnover 2) CapEx 3) OpEx • Abs./rel. per objective • Rel. tot total annual turnover, CapEx or OpEx *Commission Delegated Regulation (EU) 2021/2178, Annex II*	The investment manager should describe in their reporting to investors the overall ESG strategy and objectives of the vehicle together with the associated targets and how these goals will be facilitated by the organisation and governance framework of the vehicle. *RG70*	The reporting organisation shall report the following information: A, Gross, location-based energy indirect (Scope 2) GHG emissions in metric tons of CO2 equivalent. If available, the gases included in the calculation; whether CO, CH, NO, HFCs, PFCs, SF, NF, or all. *GRI 305-2* *EPRA sBPR GHG-Indir-Abs*

Using the CRREM risk assessment tool

The Carbon Risk Real Estate Monitor (CRREM) risk assessment tool has been developed for owners and investors to understand the carbon risks associated with their real estate portfolio. CRREM has derived decarbonisation pathways by breaking down the global anthropogenic GHG emissions budget, consistent with the Paris Agreement, to individual countries, the commercial real estate sector, property types and individual assets. The tool provides the ability to assess the progress of a portfolio's carbon reduction performance against reduction targets (the developed 'pathways') in line with the Paris Agreement. The CRREM tool helps users to identify properties at risk of displacement due to anticipated tightening of building codes, regulation, and carbon pricing. It also enables analysis of the impact of individual property refurbishment on a company's overall carbon footprint, including assessment of emissions associated with the embodied carbon of the energy refurbishment itself.[16]

Figure 13 illustrates two different corporate strategies in relation to the timing of energy retrofitting and decarbonisation. Heterogeneous portfolios require different approaches depending on how exposed each property and use type is to carbon risk, depending on location and age, depending on the cost of retrofitting, etc.[17]

Figure 13: Managing carbon risk



CASE STUDY AXA IM

Carbon Risk Real Estate Monitor (CRREM) Tool: AXA IM Case Study

AXA Investment Managers (AXA IM) is a global investment management firm operating as the investment arm for AXA, a global insurance and reinsurance company.

For most of AXA IM's assets under management, they incorporate ESG analysis and quantitative ratings into the investment process and apply key exclusion criteria. AXA IM believes this also benefits their clients' financial performance by identifying opportunities and risks created by sustainability trends in the global economy.

Using CRREM tool for carbon risk assessment

High carbon intensity properties and portfolios create negative environmental impacts, but also have associated financial risks, with potential to jeopardise the business case of a real estate company if measures are not implemented to transform the managed real estate portfolio.

AXA IM finds the CRREM tool very useful for investors and property owners to identify potential financial risks from climate change impacts associated with poor energy efficiency at an early stage.

CRREM has brought initial guidance on how to measure and minimize stranding risk; and it is the first tool that gives comparability and granularity on carbon cost exposure that AXA IM could use to open discussions internally and externally. In addition, CRREM* provides target values to guide a sensible and effective strategy for reducing CO_2 emissions.

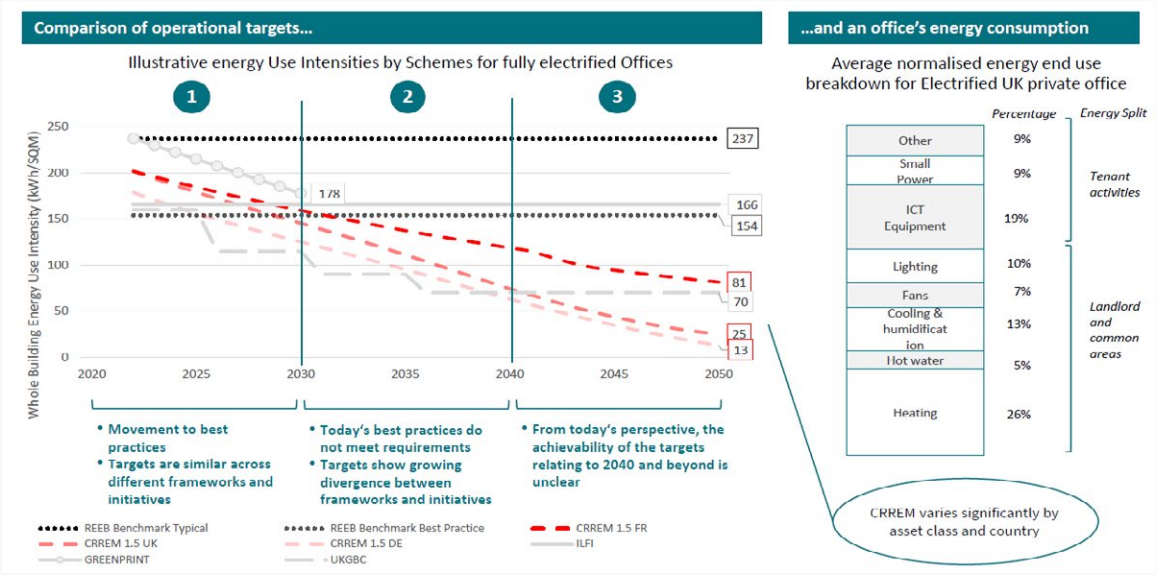
Expanding on the existing challenges and alignment with frameworks

The following figure depicts a comparison of framework targets, including CRREM, Greenprint, UKGBC, ILFI, and REEB, between 2020 and 2030. It is noticeable that between these years, all standards converge, but after they split with CRREM being the most ambitious one with a question on achievability.

For AXA IM, the high-level alignment with other frameworks and standards (eg, SBTi) is one of the best parts of using the CRREM tool. Alignment with other frameworks and standards brings several advantages, including but not limited to the ones listed below:

*It should be noted that the CRREM method is recently updated and the exact significance for practice still needs to be clarified.

CRREM pathways – Office



Sources: BBP, 2021, CRREM 2021, SBTI 2020, UKGBC 2020, ILFI 2018, Greenprint, 2022, AXA IM LET-I RE2020ST

- Standardisation of information exchange in the market;
- Increased credibility;
- Comparability, making it easier for investors to compare and track progress;
- Increased accountability, through an easier comparison it will become easier for stakeholders to hold market participants accountable on their public commitments;
- Enables increasing engagement with other industry bodies, such as GRESB and MSCI.

Integrating CRREM in the data collection process

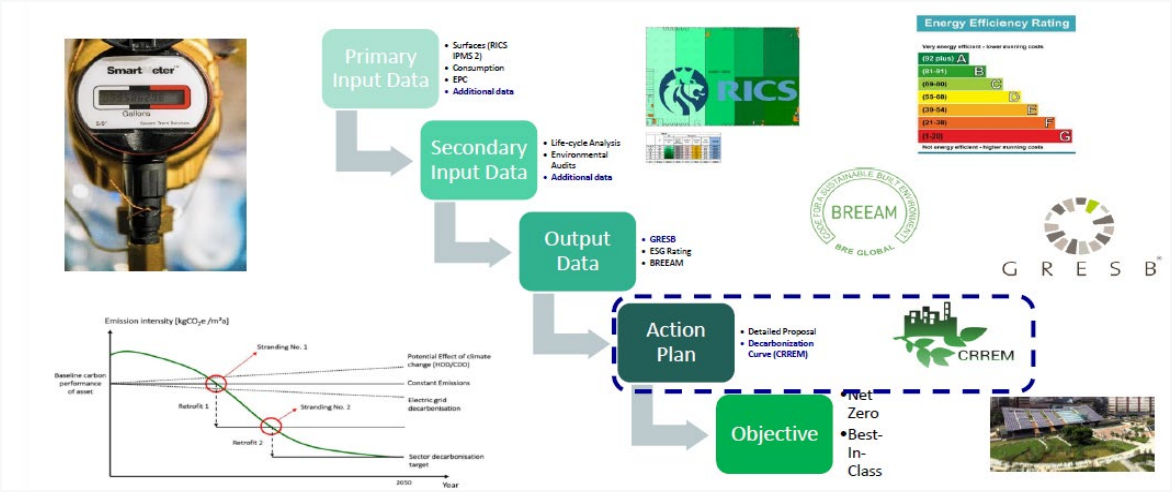
In order to integrate CRREM properly in the data collection process, various tools are needed to improve a building's carbon footprint. Therefore, additional data and further standardization is required. Hence, assumptions must be taken, and new data points collected to utilise the tool. An absence of guidance on 'minimum' assumptions can lead to a very different assessment on stranding risk, especially in the absence of real data and lack of visibility on actual use. An 'office' may be a tech student living campus, with restaurants, pools etc. – and not at all comparable with standardised typologies.

Challenges of the tool

Although AXA IM thinks that CRREM can complement existing carbon reporting, they identify some challenges which need to be addressed for a better usage and certain areas for improvement. These include, among others:

- From today 's perspective, the achievability of the targets relating to three decades and beyond is unclear;
- Model is still being finetuned by an increased standardisation in the industry and augmented data quality have an impact on stranding years;
- Currently, CRREM measures the 'whole building' operational risk of an asset. Where actual data is used, this blurs the impact of tenant operations with building fabric and systems;
- Additional assessment is needed to assess the 'intrinsic' building risk, where an owner can effect change and control elements such as fabric and systems, only considering 'normalised' performance;
- Technical nuances to be clarified at tenant, sector, and country level;

Integrating CRREM in the data collection process



Source: AXA IM

- Sector benchmarks and on the achievability of the high ambition level of CRREM targets; ie after 2030 CRREM provides more ambitious targets than other standards

Although the tool is already widespread in the industry not all clients and service providers are familiar yet leading to a knowledge gap which is yet to be bridged.

AXA IM also raised the challenges around the data collection. An asset's stranding year is impacted significantly by the quality and availability of underlying data. It is expected that this will improve moving forward.

Lessons learned

CRREM has the potential to become an integral part of AXA IM's investment process, in making more informed investment decisions and managing assets better through some improvements.

They believe that there is need for clarity on how CRREM can be used in investment decisions moving forward and how to adequately bridge the knowledge gap (i.e. training the staff and stakeholders). AXA IM tries to define it from a practical perspective; what exactly it means when an asset is stranded according to CRREM, not necessarily losing its value and how they can position themselves.

They use CRREM as it provides a consistent framework that's embedded in other frameworks and to which AXA IMs clients increasingly refer to in the market. Although they support the tool as it has a potential to bring a common language, it is also important not to overlook the nuances on stranding risks.

CASE STUDY HINES

Obtain data to measure and improve ESG performance

Hines is a global real estate investment, development, and property manager. ESG is firmly anchored in the company's strategy. The firm's goal of net zero operational carbon by 2040 is being driven by a broad action plan that among a wide range of initiatives includes topics such as the unlocking of win-win investments by using green leases or starting smart building initiatives.

The key to achieving these goals is obtaining data to measure and report ESG performance. One of the biggest challenges in aggregating ESG data is obtaining whole-building data, i.e., the landlord- and the tenant-controlled areas. Effective cooperation between landlord and tenant is necessary to obtain whole-building data, and Hines has identified best practices in engaging with occupiers across the firm's platform in 314 cities and 28 countries.

Importance and measurement of tenant data
It is becoming increasingly important to work programmatically with the occupier base as indirect carbon emissions resulting from tenants' operational energy consumption (i.e., scope 3 emissions) account for the lion's share of most portfolios' total carbon emissions. In the case of the Hines European Core Fund (HECF), this share amounted to 81% in 2021.

When leases get amended, are renewed or new ones are signed, it is critical that they include legal clauses that allow for energy consumption data (and other environmental data) to be captured automatically via meters or provided to the landlord by the tenant in a reliable fashion. This way, data collection is no longer dependent on recurring operational tenant cooperation. While data collection efforts are evolving fast, Hines is not yet at 100% data capture across all 28 countries where it is doing business, so it is not yet possible to measure the full impact on firm-wide strategy implementation. In the long term, all decarbonization measures will be implemented step-by-step and the impact of these actions will be measured over time.

In terms of industry awareness, it has been seen that there is a lack of understanding on the large extent of scope 3 emissions. Therefore, dialogue in the industry is critical to build understanding between stakeholders about investments required in data technology and willingness to share data.

Implementing smart devices – Hines European Core Fund (HECF)
To implement smart devices for one of the firm's flagship funds, HECF, three different elements contributed to more efficient collecting, processing, and reporting of energy data.

Local asset managers and property managers, supported by the Hines ESG team and an external sustainability consultant, led the data collection and central data processing efforts for the fund.

In 2020, ZiggyTec's innovative smart metering, or IoT (Internet of Things) devices, were rolled out to part of the portfolio's assets to support the automation of utility data collection. Where implemented, this significantly reduced the time to request and process meter reading and invoices.

Finally, Evora Global's ESG software platform SIERA was used to gather and aggregate portfolio-level ESG data for ESG reporting purposes. The SIERA platform offers API data integration to the GRESB portal, thus helping to reduce reporting efforts. Additionally, the aggregated portfolio data is extracted for Hines' Global Data Hub and Hines is currently building a link to financial performance metrics. Before reporting, all ESG data is independently assured by a third party following AccountAbility's AA1000 Assurance Standard. And, moving forward, HECF will upgrade to SIERA+ ESG software platform to allow for more seamless collaboration between property, asset, and investment teams.

The implementation of these data collection automation measures and software technologies has helped HECF continue to achieve close to 100% energy data coverage over the past GRESB reporting years in a much more streamlined and less labour-intensive manner.

Lessons learned

In the case of HECF, the installation of this generation of smart devices was not possible for all buildings in countries across the world. Further, facilitating IoT implementation with the help of local experts and engineers was also not as easy as expected. An equivalent, more global software provider was not available at that stage. Currently efforts are underway to establish an approach to smart meter data capture with newer-generation technology.

Data collection will remain one of the complex challenges in the industry, as there are different systems in different countries, so allowing for regional differences will always be necessary.

Long-term leases must be carefully thought through, especially as larger tenants themselves may have net zero targets or underlying regulations. The more energy efficiency and energy usage measurement options can be offered to the tenant, the better the selling point for the landlord.

3. REAL ESTATE ESG REGULATORY AND REPORTING STANDARD MAPPING

3. REAL ESTATE ESG REGULATORY AND REPORTING STANDARD MAPPING

3.1 Methodology

The ESG regulations and standards within the scope of the study were mapped according to the methodology set out in this chapter. The standards were mapped to understand their coverage of ESG criteria and their application and relevance to the real estate sector.

The results of the study identify the thematic coverage (environmental – social – governance) of the different standards, their purpose and relevance for various stakeholders and the status quo for the real estate sector. The results are intended to help organisations navigate the evolving landscape and identify the most relevant and important standards within the context of their ESG strategy and stakeholder audience. The study highlights areas of thematic overlap and where it may be possible to condense the reporting burden. However, it is important to note the limitations regarding the extent to which the standards overlap, given the different respective purpose of each standard.

The mapping does not extend to guidelines on reporting principles (e.g., consistency, accuracy, comparability of information). Where sector-specific standards were available, real estate, construction and in part investment/asset management were included. Some general disclosures about the organisation to inform the context of the sustainability disclosures were not included, as they were not considered sufficiently relevant to the mapping exercise (e.g., general disclosures relating to details about an organisation's structure and reporting practices, activities and workers, governance, strategy, policies, practices and stakeholder engagement).

Figure 14 provides an overview of the ESG criteria used to determine the categories for the mapping exercise.

Defining the ESG criteria for the mapping exercise
Due to the comprehensive nature of the EU Taxonomy classification system (which the European Commission considers a global leader for setting sustainable finance standards[18]), the categories defined in the EU Taxonomy

Figure 14: Derivation of the ESG categories

Category	Commonly defined criteria	ESG categories used in the mapping exercise
Environmental	• climate mitigation • climate adaptation • pollution prevention • biodiversity • water • circular economy	• E - climate mitigation • E - climate adaptation • E - pollution prevention • E - biodiversity • E - water • E - circular economy
Social	• decent work • adequate living standards • wellbeing for end-use • inclusive and sustainable communities and societies	• S - health and safety • S - employees • S - community impact
Governance	• strategy • governance • compliance • risk management system	• G - strategy • G - governance • G - compliance • G - risk management • G - economic information • G - sustainability • G - environmental • G - social

were used as the starting point against which the requirements of the other standards were mapped.

The EU Taxonomy provides a helpful thematic framework linked to the Paris Agreement and the UN SDGs. This thematic framework was then adjusted to ensure a full reflection of the requirements of the different standards and their application to real estate organisations across the investment life cycle.

However, it is again important to note the challenges and limitations of mapping the requirements to this thematic framework given the different respective purpose of each standard. To illustrate this, the purpose of each requirement was also mapped (e.g., describe, define, manage and measure).

For the environmental and social categories in the table, the EU Taxonomy is used as a legal framework which provides six core environmental objectives, while the social criteria are still being defined. In this study a general reference is provided to the EU Taxonomy definitions and criteria to categorise environment-related disclosure requirements. The proposed social requirements of the EU Taxonomy were generalised and simplified to reflect the most common themes in the standards in scope.

The governance topics are based on recognised elements of strategy, governance, compliance, and risk management systems. The commonly used elements are combined with thematic focus areas.

Interconnectedness of categories

Certain requirements fall into multiple categories set out above. The assessment of climate risks could be categorised as an environmental KPI 'E – climate mitigation' or may be interpreted as a general governance question relating to environmental considerations. Where this is the case, the purpose and context of the relevant standard has been considered to determine the category the requirement should be mapped to. It is important to note the categorisation cannot be overly scientific, and the mapping of the metrics should be read in this context.

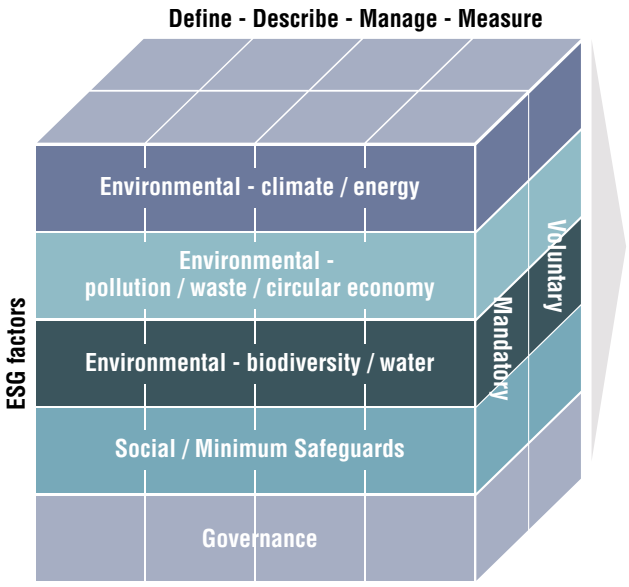
For example, where CDP asks real estate organisations to disclose quantitative Scope 1/2/3 GHG emissions data in metric tons CO_2e, this has been categorised as 'E - climate mitigation' and 'measure' as the purpose of the requirement is to improve global GHG emissions disclosure and, by doing so, provide better information on organisations' climate impact.

However, TCFD requires the organisation to disclose similar information, but the TCFD recommendations are broadly categorised as governance related as it focuses on managing climate-related risks and opportunities (i.e., the impact of the climate on the organisation). Therefore, the requirements around metrics and targets within TCFD have been categorised under governance as 'G - risk management' and 'measure'.

It is important to keep in mind the interconnected nature of the different requirements (e.g., governance and climate) when interpreting the results of the study.

Figure 15 shows which dimensions are considered when mapping the different standards.

Figure 15: Mapping dimensions



3.2 Overview of mapping results

The results of the mapping exercise, which includes the frameworks and standards shown in figure 2 and described in chapter 2.2 (undertaken in accordance with the methodology previously described), are summarised in the dashboard of figure 16.

For an introduction on the types of standards, see chapter 2.2.

Largely this study differentiates between reporting on corporate and on portfolio/fund level. Most reporting standards address the corporate reporting level.

On portfolio / fund level, we included three reporting standards – PRI (a commitment), INREV (the industry standard for European non-listed real estate vehicles) and SFDR (the EU sustainable finance regulation – it also includes requirements at organisational level). Major sustainability accounting requirements for funds have not yet been introduced.

In comparison, corporate-level reporting splits into various frameworks and standards. The difference between frameworks (such as TCFD and CDSB) or industry guidelines (such as EPRA) and standards is that frameworks have high-level governance requirements (mapped) with detailed guidance (not included in the mapping). The different levels of the standards considered in the study can be seen in figure 2.

Standards replace frameworks by putting the guidance into practice, further detailing disclosure requirements, and consequently include a much higher number of metrics. Frameworks and governance metrics require interpretation and may have qualitative and quantitative elements to be described extensively, whereas science-based, implementation or financial metrics are concrete. Therefore, the number of metrics does not necessarily reflect the complexity or effort required to comply.

Extensive questionnaires such as PRI or CDP obviously require effort, but reporting processes can be streamlined over time.

Mandatory standards will generally be subject to third-party assurance and include complex requirements with legal implications. Voluntary standards encourage third-party assurance or some level of independent review to ensure compliance with reporting principles and accuracy of the data disclosed.

The evaluation has shown that EU regulation can be seen as the global frontrunner for sustainable finance regulations. The following EU regulations are considered in the study: the EU Taxonomy, SFDR, and CSRD. All other standards considered are international standards.

The double materiality perspective

For an introduction on the topic of materiality, see chapter 2.

Only GRI and CBI have been identified as sustainability standards with an impact materiality perspective. All other frameworks and standards have been identified as having either a double materiality perspective or a financial materiality investor perspective (even if the standards recognise outside impacts). For the latter, the investors' focus is on the impact of sustainability risks on the value of the company. Measuring the effects on people, the environment or the economy is not the core purpose.

In terms of thematic focus, the underlying materiality assessments of the standards tend to prioritise climate change. GRI, for example, has the most comprehensive coverage of E, S and G topics, but also requires a materiality assessment for application – not all goals can be achieved at once, but require a long-term strategy.

The INREV sustainability reporting guidelines combine the inside impacts on portfolio/asset value with the outside impacts on environment/people by understanding how sustainability risks are considered in investment and risk management processes.

Metrics for the real estate industry

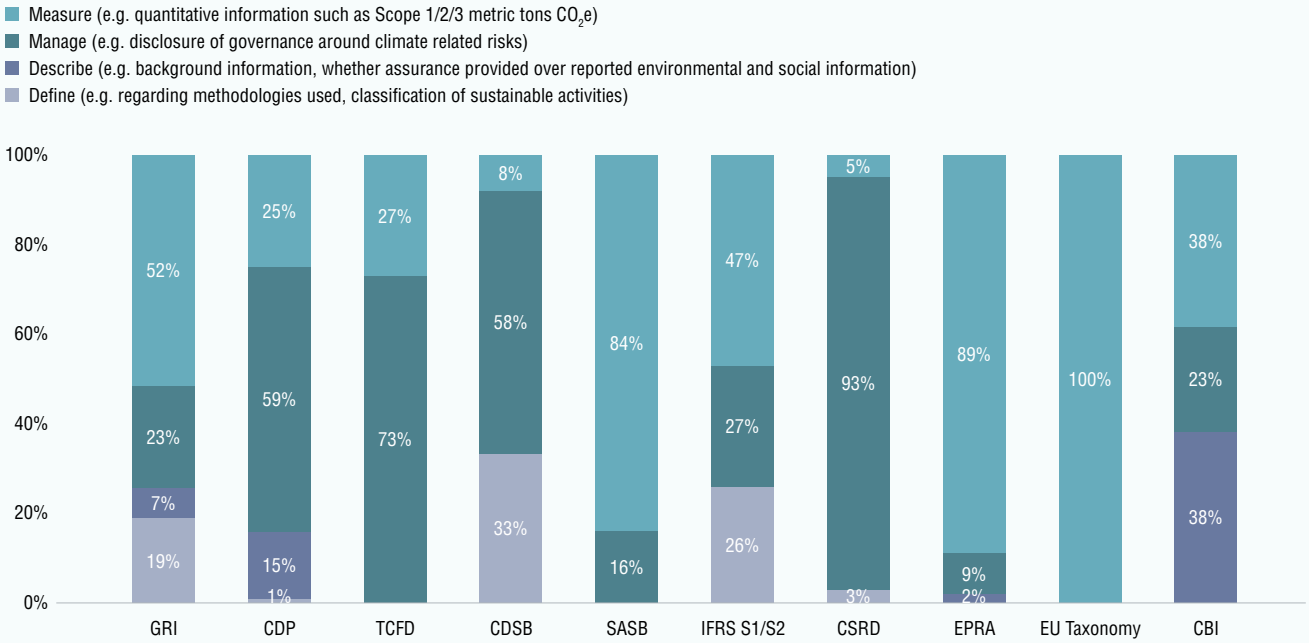
Of the 14 guidelines and standards considered in this study, nine have real estate specific metrics. Those standards that contain real estate-specific metrics provide tailored metrics that are easier to understand in an industry context. Often the materiality of topics was determined beforehand, and the assessment thereof should remain relevant and applicable, but the understanding of ESG and best practice is moving forward rapidly, so a supplementary materiality analysis of all ESG themes is recommended, through GRI or sustainable finance regulations as a baseline. The EU Taxonomy technical screening criteria provide the most ambitious benchmark, whereas the SASB (foundation for IFRS S2) should be treated as a minimum standard whilst ambitions increase to meet the UN SDGs and the Paris Agreement. The impact of the EU Taxonomy remains to be seen, but it is expected to challenge current best practice. Under the SFDR principal adverse impact statement there are mandatory and additional disclosure indicators for real estate.

Figure 16: Mapping overview

Key data	GRI Global Reporting Initiative		CDP Climate Disclosures Project		TCFD Task Force on Climate-Related Financial Disclosures		CDSB Climate Disclosure Standards Board		SASB Sustainability Accounting Standards Board		IFRS S1/S2 International Financial Reporting Standards		CSRD Corporate Sustainability Reporting Directive	
Category of standard	Sustainability reporting		Scoring		Sustainability-related financial reporting		Sustainability-related financial reporting		Sustainability-related financial reporting		Sustainability-related financial reporting		Sustainability-related financial reporting	
Level of standard	Standard		Scoring		Framework		Framework		Standard		Standard		Standard	
Type of standard	Corporate		Corporate		Corporate		Corporate		Corporate		Corporate		Corporate	
Application	Voluntary		Voluntary		Voluntary		Voluntary		Voluntary		Mandatory		Mandatory	
Real estate specific	Planned		Yes		No		No		Yes		Yes		No	
Life cycle specific	No		Yes		No		No		Yes		Yes		No	
Scope of standard														
Governance indicators	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Science-based metrics	Yes		Yes		Yes		No		Yes		Yes		Yes	
Implementation targets	Yes		Yes		No		No		Yes		Yes		Yes	
Financial metrics	Yes		Yes		No		No		Yes		Yes		Yes	
Total number of metrics	**398**		**702**		**11**		**12**		**51**		**253**		**40**	
Thematic breakdown														
E - climate mitigation	77	19%	201	29%					17	33%	54	21%		
E - climate adaption	5	1%							4	8%	11	4%		
E - pollution prevention	28	7%												
E - circular economy	5	1%												
E - water	35	9%	151	22%					10	20%	44	17%		
E - biodiversity	26	7%	178	25%										
S - health and safety	73	18%							4	8%				
S - community impact	18	5%							5	10%				
S - employees	43	11%												
G - governance	1	0%	46	7%	2	18%	1	8%			20	8%	13	33%
G - compliance	52	13%	33	5%			6	50%					10	25%
G - strategy	-		10	1%	3	27%	2	17%			26	10%	8	20%
G - risk management	9	2%	28	4%	6	55%	3	25%			49	19%	2	5%
G - economic information	23	6%	18	3%					5	10%	19	8%		
G - sustainability	-								2	4%	3	1%	2	5%
G - environmental	3	1%	37	5%					4	8%	27	11%	4	10%
G - social	-												1	3%
Total E	**176**	**44%**	**530**	**75%**	-	**0%**	-	**0%**	**31**	**61%**	**109**	**43%**	-	**0%**
Total S	**134**	**34%**	-	**0%**	-	**0%**	-	**0%**	**9**	**18%**	-	**0%**	-	**0%**
Total G	**88**	**22%**	**172**	**25%**	**11**	**100%**	**12**	**100%**	**11**	**22%**	**144**	**57%**	**40**	**100%**
Purpose breakdown in %														
Define	75	19%	9	1%							65	26%	1	3%
Describe	28	7%	105	15%			4	33%						
Manage	90	23%	412	59%	8	73%	7	58%	8	16%	68	27%	37	93%
Measure	205	52%	176	25%	3	27%	1	8%	43	84%	120	47%	2	5%
Notes			Reporting is for scoring purposes.		" Not including guidance. ""Measure"" as a governance question, not actual data output. Real estate specific guidance. "				ISSB embedded SASB's industry-based approach to standards development		Exposure Draft		European Sustainable Reporting Standards (Draft) are not reflected in the mapping but cover all ESG categories.	

Key data	EPRA European Public Real Estate Association		EU Taxonomy		CBI Climate Bonds Initiative		PRI Principles for Responsible Investment		INREV European Association for Investors in Non-Listed Real Estate Vehicles		SFDR Sustainable Finance Disclosure Regulation		GRESB* Global Real Estate Sustainability Benchmark	
Category of standard	ESG reporting		Sustainable finance standard		Sustainable finance standard		Scoring		Sustainability-related financial reporting		Sustainable finance standard		Scoring	
Level of standard	Guidelines		Standard		Label		Commitment		Guidelines		Standard		Benchmark	
Type of standard	Corporate		Corporate		Corporate		Investment		Investment		Investment		Investment	
Application	Voluntary		Mandatory		Voluntary		Voluntary		Voluntary		Mandatory		Voluntary	
Real estate specific	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Life cycle specific	No		Yes		Yes		Yes		Yes		No		Yes	
Scope of standard														
Governance indicators	Yes		No		Yes		Yes		Yes		Yes		Yes	
Science-based metrics	Yes		No		Yes		No		Yes		Yes		Yes	
Implementation targets	No		No		No		No		Yes		No		No	
Financial metrics	No		Yes		Yes		No		No		No		No	
Total number of metrics	**56**		**29**		**13**		**1103**		**132**		**40**		**100**	
Thematic breakdown														
E - climate mitigation	16	29%			13	100%			39	30%	8	20%	30	30%
E - climate adaption									9	7%				
E - pollution prevention	5	9%							10	8%				
E - circular economy											2	5%	5	5%
E - water	3	5%							7	5%			6	6%
E - biodiversity									1	1%	1	3%		
S - health and safety	4	7%							9	7%			8	8%
S - community impact	3	5%							10	8%			8	8%
S - employees	11	20%					14	1%					8	8%
G - governance	9	16%					599	54%	2	2%	5	13%		
G - compliance	3	5%					317	29%	1	1%	12	30%		
G - strategy							39	4%	10	8%	1	3%	7	7%
G - risk management							75	7%	1	1%	11	28%	10	10%
G - economic information			29	100%			1							
G - sustainability							1	0%	8	6%			20	20%
G - environmental	2	4%					57	5%	8	6%				
G - social									17	13%				
Total E	**24**	**43%**	**-**	**0%**	**13**	**100%**	**-**	**0%**	**66**	**50%**	**11**	**28%**	**41**	**41%**
Total S	**18**	**32%**	**-**	**0%**	**-**	**0%**	**14**	**1%**	**19**	**14%**	**-**	**0%**	**24**	**24%**
Total G	**14**	**25%**	**29**	**100%**	**-**	**0%**	**1,089**	**99%**	**47**	**36%**	**29**	**73%**	**37**	**37%**
Purpose breakdown in %														
Define														
Describe	1	2%			5	38%	239	22%			12	30%	20	20%
Manage	5	9%			3	23%	672	61%	23	17%	10	25%	60	60%
Measure	50	89%	29	100%	5	38%	192	17%	109	83%	18	45%	20	20%
Notes			Incl. both non-financial undertakings and asset managers. Technical screening criteria are real estate specific, not the disclosures.		Eligibility criteria are real estate specific, not the disclosures.		Reporting is for scoring purpose. Includes all asset classes. "Describe" contains 383 statistical disclosures. "Measure" as a governance question, not actual data output.				Real estate relevant principal adverse indicators (PAI); not incl. minimum social safeguards		*GRESB not included within the detailed mapping exercise. GRESB requirements have been categorised above based on the summary information set out in the GRESB 2022 Real Estate Assessment	

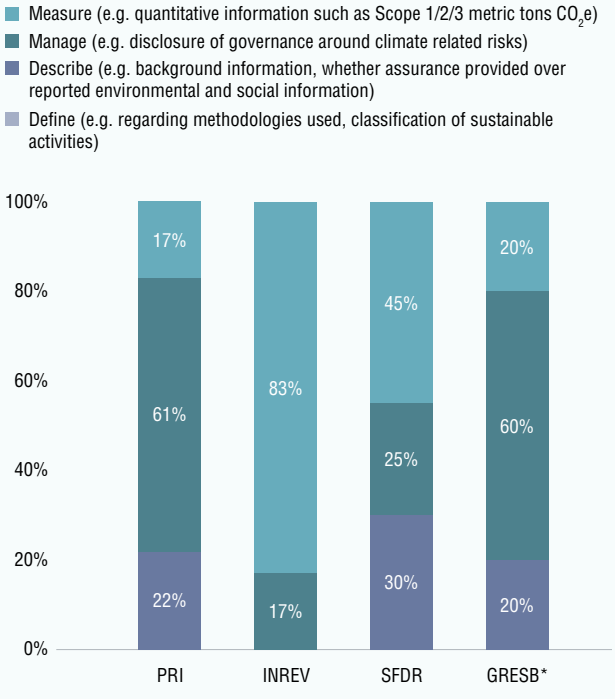
Figure 17: Scope of ESG standards by core corporate standards



The EPRA Standards and INREV Guidelines, on corporate and portfolio/fund level respectively, interpret general ESG considerations and best practice in the context of the real estate industry and present useful frameworks. They align with other standards, but do not aim to represent full compliance with other standards and regulations.

For an introduction on types of metrics, see chapter 2.

Figure 18: Scope of ESG standards by portfolio/fund level standards



**GRESB is also added as an industry assessment benchmark. 2022 GRESB Real Estate Assessment considered at a high level (not within scope of detailed mapping exercise)*

We can see from figures 17 and 19 where the focus of a standard lies:

- Is it to define what constitutes sustainability (either by the standard or the user)?
- Is it to provide descriptions of company operations to set the context for ESG risks by business activity and location?
- Does the standard require you to demonstrate how you manage ESG risks ('show') or disclose actual measured ESG data ('tell')?

As discussed in the introduction, the historic development of early voluntary ESG initiatives and commitments was driven by transparency on governance and strategy ('manage') to give the reader a better understanding of a company's approach and understanding of ESG risks. The new era of data-driven disclosures aims to provide evidence of the effectiveness of such approaches and measure inside and outside effects. Both sides of the coin provide valuable insight for the reader and should be provided in an aligned disclosure.

In the case of frameworks or guidelines, 'measure' was used to indicate where requirements are in place to define metrics and targets to measure ESG risks and performance (without prescribing them). In general, 'measure' was used for standards which prescribe the exact metrics and data to be disclosed. Frameworks or guidelines will thus concentrate on 'manage' (e.g., governance metrics), whilst

more industry-specific or thematic standards will require more data-driven disclosures.

The GRI has a strong weighting for 'define' as it requires comprehensive disclosures on how the user interprets definitions, applies methodologies, and makes calculations. While not providing definitions itself, the GRI ensures that there is sufficient transparency to enable like-for-like comparisons between different users.

The only standards containing an actual direct definition of sustainability are the EU Taxonomy (via the technical screening criteria), the SFDR (with legal uncertainty and a reference to the EU Taxonomy) and the CBI (via the eligibility requirements). Scoring assessments such as PRI, CDP and GRESB benchmark within the industry, but not against a defined standard. The industry thus creates a benchmark that has to be recalibrated as standards develop. Indirectly, many standards will set a benchmark of sustainability for example by measuring the operational implementation of certain measures which are considered best practice.

Thus, in the context of preventing greenwashing and enhanced transparency, frameworks and guidelines present an excellent basis describing the sustainability governance structure but choosing the most relevant and applicable science-based, implementation and financial metrics is key for sustainability credibility.

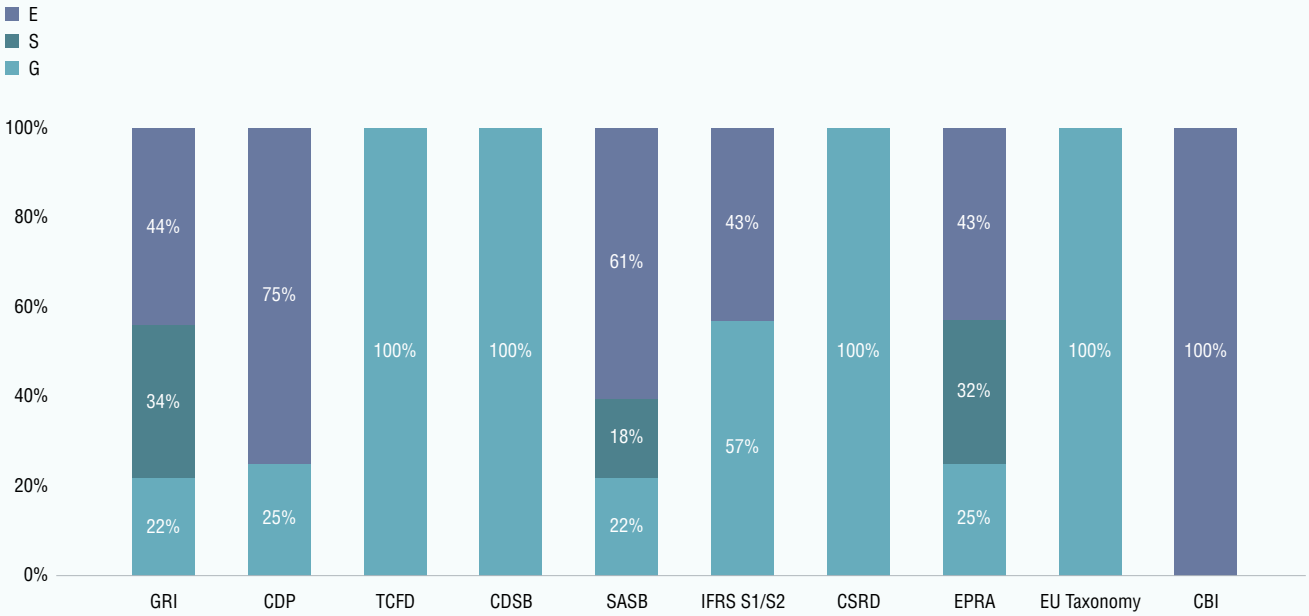
What metrics to choose

For an introduction to the purpose of different metrics, see chapter 2.

Governance metrics are the starting point for implementing ESG within the organisation from top to bottom. Governance must always be tailored to the size and complexity of the organisation and business operations. (See case study on CBRE IM). For corporate reporting, this study classifies TCFD, CDSB, CSRD and EU taxonomy as governance related. Similarly, the PRI assessment is very useful for checking all stages of integrating sustainability into the organisation from an asset owner or asset/fund manager perspective and is classified as governance related.

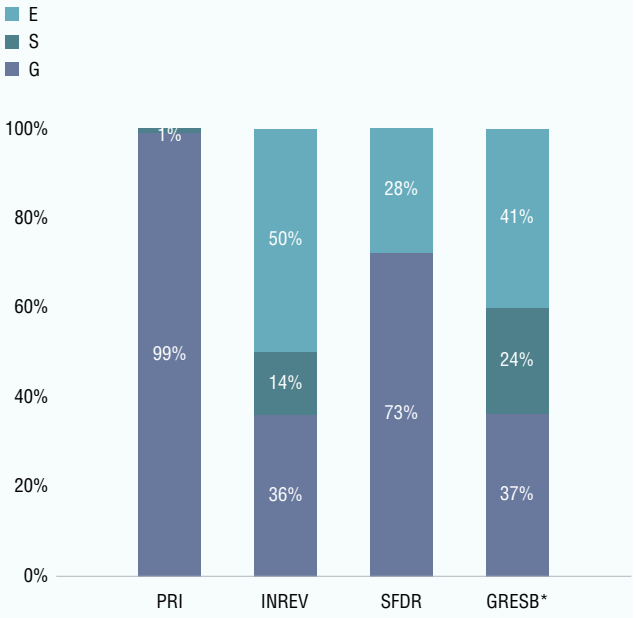
Science-based metrics are arguably the most challenging to collect data for given data quality and coverage issues, but are most important for regulators, investors and other stakeholders as they represent the data basis for working towards net zero and combating climate change as well as achieving the UN SDGs. Using science-based metrics, for example in combination with a public commitment through the Science-Based Targets Initiative, Net Zero Asset Managers initiative, or CRREM specifically for the real estate industry demonstrates the credibility of a company's ESG strategy. Most standards will contain basic KPIs for scope 1, 2, and 3 GHG emissions as well as energy consumption, so alignment of definitions is

Figure 19: ESG composition by real estate corporate standards



** Climate and environmental criteria is also included within 'G' due to the nature of the requirements (as well as some social criteria also) - please see Governance topic composition per standard.*

Figure 20: ESG composition by standard/benchmark - portfolio/fund level standards



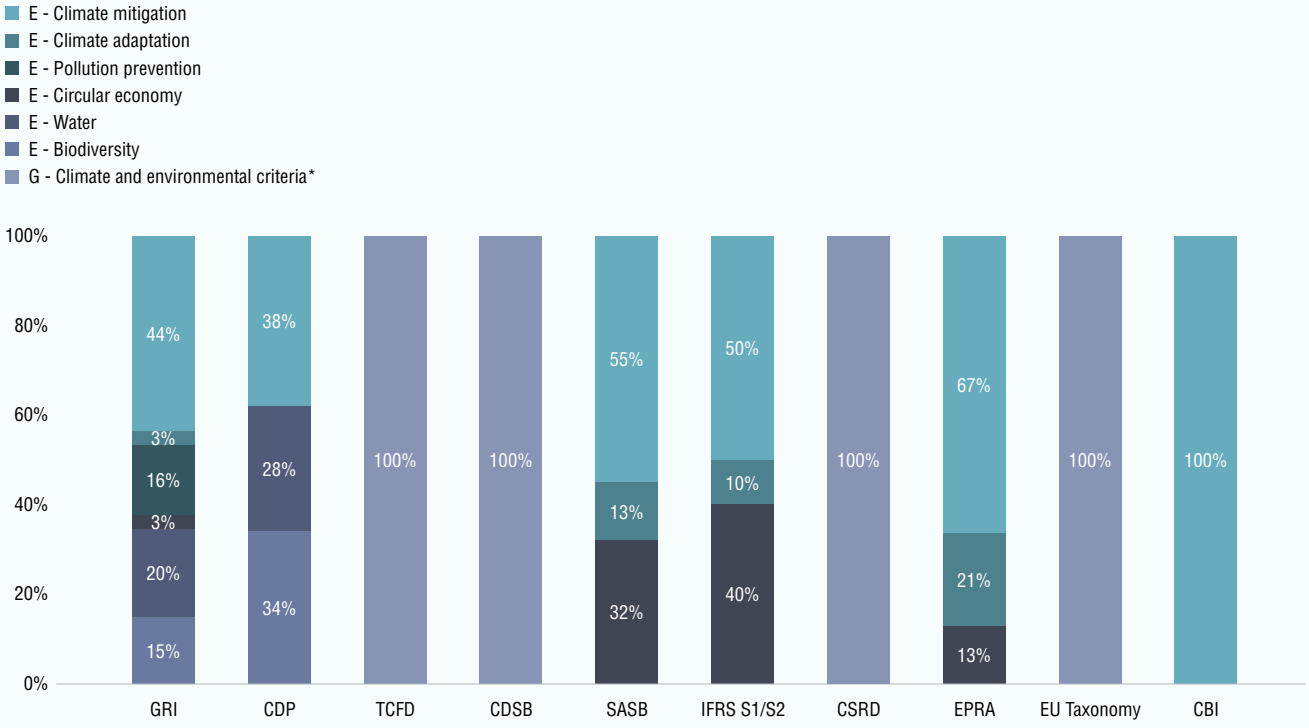
**2022 GRESB Real Estate Assessment is considered at a high level (not within scope of detailed mapping exercise)*

required especially in this area. Overlaps on most important environmental topics – driven by the long-standing TCFD framework – are notable across all standards, but convergence is required as to the exact measurement and definition (especially scope 3 requires clarity). In terms of sustainability materiality, science-based metrics are the only instrument for measuring outside impacts.

Implementation metrics like SASB and GRESB are very good for defining real estate specific action points for implementing ESG measures on asset/portfolio level. Benchmarking peers through GRESB (on portfolio level) and PRI (at an organisation level) provides useful insight in industry best practice and for identifying areas for improvement. The INREV Guidelines provide a good basis for developing detailed asset and investment portfolio and asset related strategies and plans. Detailing these plans strengthens accountability towards the investor and enables progress tracking.

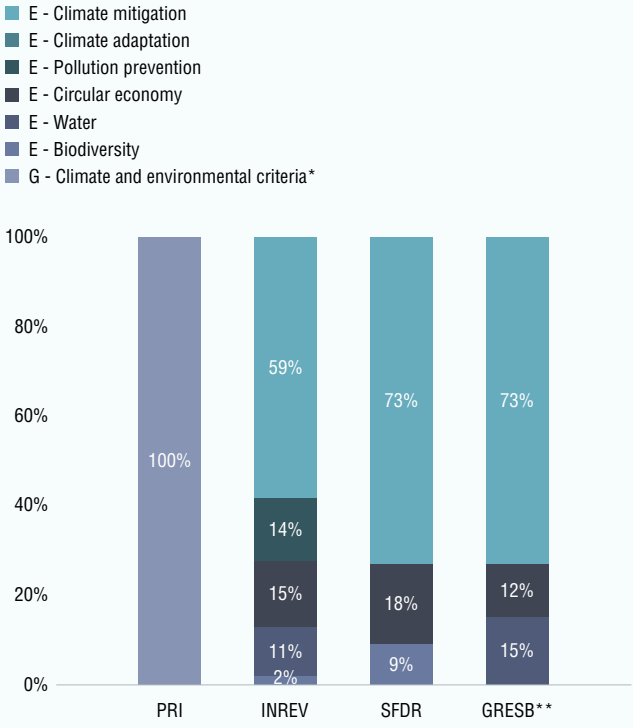
Financial metrics are divided into understanding the overall impact of sustainability risks on cashflows, assets, liabilities and ultimately company value (e.g., IFRS S1 and S2), and providing transparency on the proportion

Figure 21: Environmental topic composition by real estate corporate standards



**Climate and environmental criteria within governance-based frameworks have been categorised within governance - please see Governance topic composition per standard.*

Figure 22: Environmental topic composition by standard/benchmark - portfolio/fund level standards



**Climate and environmental criteria within governance-based frameworks have been categorised within governance - please see Governance topic composition per standard.*
***2022 GRESB Real Estate Assessment considered at high level (not within scope of detailed mapping exercise)*

of investment (CapEx, OpEx) and turnover results from sustainable business activities to foster sustainable finance. The latter supports the 'follow the money' rule, showing where money is coming in from sustainable business activities and where money is going in terms of investing internally into sustainable business activities. This links to how these investments might be financed externally, with credit institutions having to disclose their green-asset-ratio and asset managers having to disclose their proportion of investments into companies with sustainable business activities. Some financial metrics or 'economic information' mapped in this study pertain to penalties or fines for non-compliance with environmental, employment, tax or product regulations and are an indicator of a lack of a proper governance system (see GRI and CDP). In addition, some financial metrics pertain to losses resulting from things such as accidents with environmental impact, stranded assets or recalled products.

Thematic focus

Looking at the ESG criteria indicates where the thematic focus of a standard lies. However, TCFD, CDSB and the EU Taxonomy (technical screening criteria, not mapped here) have an underlying climate theme, but are, as shown in the landscape overview, 100 percent classified as governance metrics. This is because TCFD and CDSB are governance-based frameworks, while the EU Taxonomy requires financial disclosures based on a taxonomy of sustainable business activities (for climate mitigation purposes).

As figure 20 shows, the GRI can be considered a very comprehensive sustainability standard that includes a variety of metrics across all three ESG topic areas. In comparison, SASB is much more limited due to predetermined materiality. EPRA, TCFD and CDSB are to be classified as guidelines or frameworks, which is why they have only very few actual disclosure requirements. CBI as a label has a minor annual compliance report. PRI and CDP are scorings with a variety of questions. IFRS S1/S2 are currently still a draft. After the development and adoption of the ESRS, the CSRD is expected to cover all three ESG aspects.

3.2.1 Environmental criteria

In general, given the urgency of combating climate change, it is not surprising that climate mitigation is the most comprehensively covered environmental topic across all standards. Water is considered a key second environmental topic, in particular by the real estate-specific EPRA Standards and INREV Guidelines, followed by pollution. CDP, scoring across climate, water, and deforestation, also contains a significant water focus and some biodiversity metrics in general beyond the deforestation topic (both classed as biodiversity within this study's framework).

The mapping shows that GRI is the only standard that currently covers all six environmental topics as well as all three social topics. The EU Taxonomy will develop technical screening criteria for the non-climate environmental topics in due course.

GRI and SFDR are the only standards addressing circular economy.

TCFD, CDSB and the EU Taxonomy, as mentioned before, have an underlying climate theme, but are classed as governance metrics. PRI similarly is governance-focused but has 58 environmental-related metrics.

3.2.2 Social criteria

As shown in figures 24 and 25, social metrics are underdeveloped in comparison to environmental or governance metrics, since they are based on norms and

values that are less quantifiable. Legislation and regulations globally are increasingly being issued and achieving alignment, so a more robust social framework can be expected in future. For real estate especially, aside from affordable housing and community impacts, the materiality-based focus has been on environmental impacts given the large contribution real estate makes to GHG emissions. EU regulations are currently incorporating social standards as minimum safeguards, however general social metrics such as those relating to employees and health and safety apply to all industries. In addition, 'diversity, equity and inclusion' (DEI) is seeing very strong recognition and becoming a social topic itself and for the purposes of this study would constitute a human rights topic. In addition, while there is a strong emphasis on DEI across real estate organisations, there are currently fewer requirements on DEI across the different social criteria within the mapped ESG standards.

CDSB also has social considerations. The SFDR principal adverse indicators contain social metrics but are not classified as relevant for real estate.

Figure 23: Social topics composition by core corporate standards

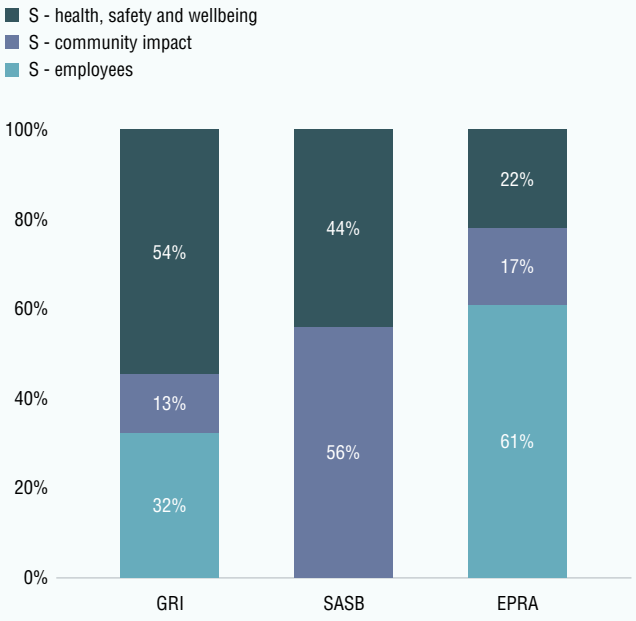
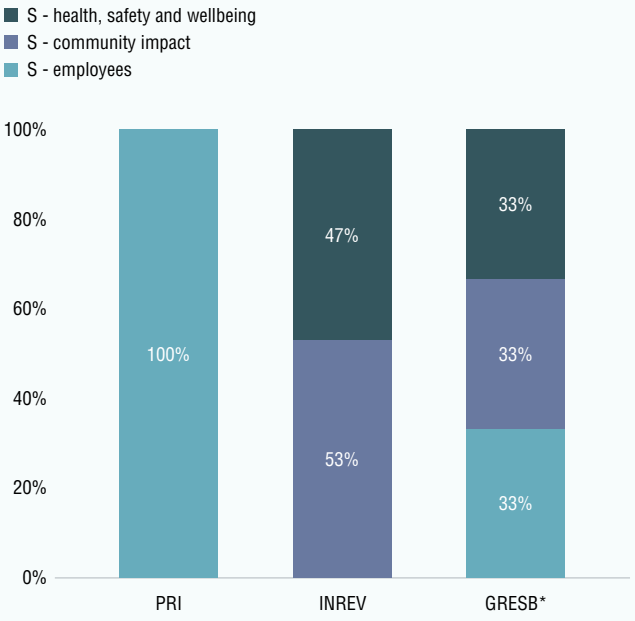
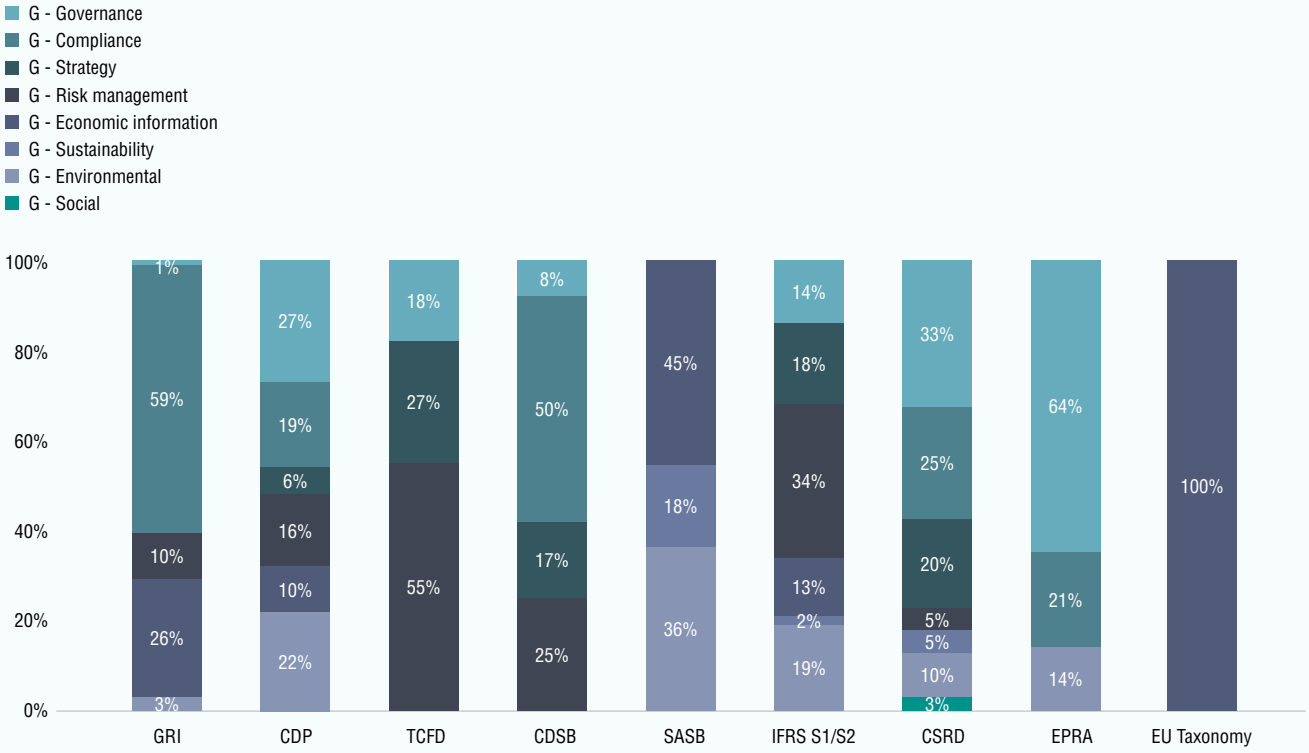


Figure 24: Social topics composition by standard/ benchmark - portfolio/fund level standards



The bar charts illustrate some of the social areas covered across the different standards. However, climate and environmental criteria significantly outweigh the social criteria across the standards.
**2022 GRESB Real Estate Assessment considered at high level (not within scope of detailed mapping exercise)*

Figure 25: Governance topic composition by core corporate standards



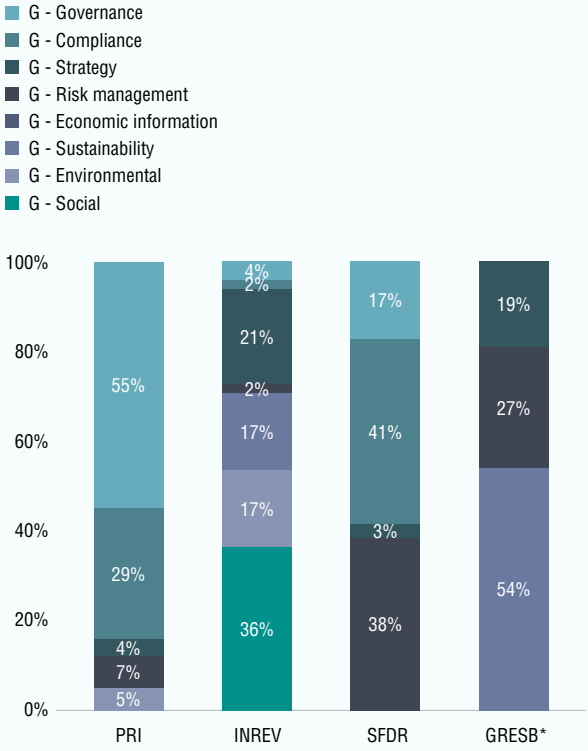
3.2.3 Governance criteria

Governance metrics have significant overlap across the standards, with differences mainly in level of detail or on sub-topic level. Within a framework, the requirements are general and supplemented by guidance, which may then form more concrete metrics in standards or scorings. Generally, the governance structure should always contain the same elements, applied to the size and complexity of the organisation and its business activities.

The strongest risk management focus is observable for TCFD, to which many other standards are aligned. CDSB reflects dependencies on and co-dependencies between natural, human and social capital, thus truly trying to achieve transparency over the complexity of positive and negative impacts and decision-making by the company.

Importantly, despite not being separately categorised in the mapping exercise, supply chain considerations are included by CDSB, CDP, GRI, and INREV and demonstrate how to think about relationships and impact when preparing for stricter future supply chain regulations.

Figure 26: Governance topic composition by standard/benchmark - portfolio/fund level standards



**2022 GRESB Real Estate Assessment considered at high level (not within scope of detailed mapping exercise)*

CASE STUDY AZORA

Using GRESB to achieve sustainability objectives

Azora is an independent capital manager in Spain, focused on real estate investment and management. It has raised national and international institutional capital since its establishment in 2003. Azora's team manages the entire investment cycle, from the identification of the opportunity, to structuring of the investment vehicles, the acquisition, restructuring, financing, asset management, reform and repositioning and eventually, the divestment of the assets. Azora specializes in several verticals, highlighting its investments in hospitality, multifamily, senior living, offices and renewable energy.

GRESB has become the reference benchmark for international investors in real estate and participating in it has become one of the most important contractual requirements in ESG matters that has been encountered in recent years in the launch of new investment vehicles as well as for the existing investments. Investors' interest in the results achieved and requests for periodic reports on the vehicle's specific actions to improve the score makes GRESB an important tool to communicate progress on sustainable investment objectives, such as decarbonisation of assets and climate change mitigation.

Azora has pioneered the contribution of portfolio data into GRESB for two asset classes where there are still few contributors: rented-residential and resort hotels.

Since 2018, Azora has been reporting the multifamily vehicle, Nestar Residencial, Sociedad de Inversión Inmobiliaria, S.A. (formerly known as Lazora, Sociedad de Inversión Inmobiliaria, S.A.), which is a residential rental investment vehicle present in Spain and regulated by the Comisión Nacional del Mercado de Valores (CNMV[19]). It has been improving its score in GRESB since 2018, standing today in the first place of its 'peer group'.

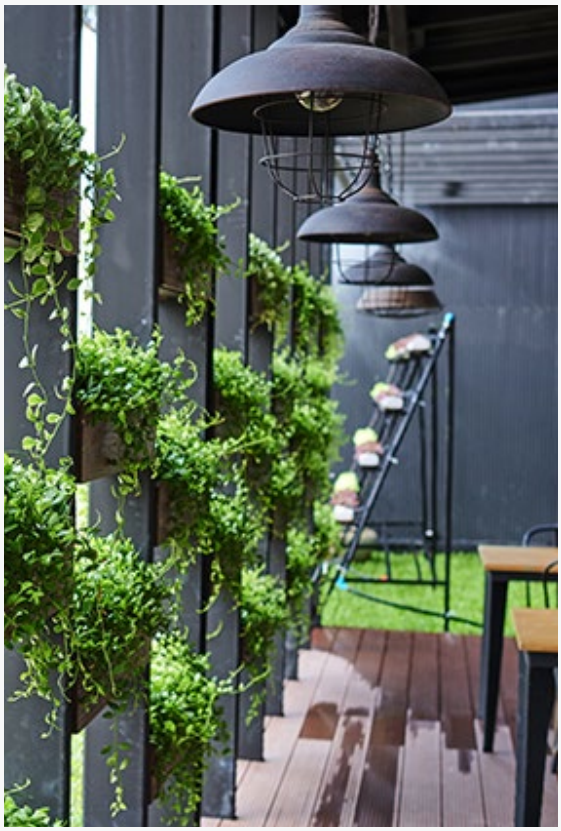
The year 2020 was the first year of presentation of the hotel vehicle, Azora European Hotel & Lodging, Fondo de Capital Riesgo, which is an investment vehicle focused on hotel businesses in Europe, also regulated by the CNMV. It has obtained very good scores in the two years that it has been presenting, improving comparatively among them.

Major change in the GRESB assessment

In 2019, GRESB changed its questionnaire to give more weight and importance to the performance of companies, with an aim to motivate them to improve their data collection systems and monitoring of environmental KPIs.

On the residential portfolios, while Azora has control of the common areas in most rental assets, the tenants have control of their private area. This brings a great challenge for Azora to carry out active management of its asset portfolio and monitor the energy and water consumption of its buildings. By using the GRESB assessment as a benchmark, Azora identified several action points to address these challenges and implement their sustainability objectives at asset level, including but not limited to inclusion of the sustainability clauses in tenant contracts, monitoring waste management, implementing measures to reduce environmental impact, installing and improving the efficiency of equipment and systems, and promoting the generation of energy from renewable sources.

In the Hospitality and Senior Living operating businesses, the level of operational control is defined by Azora's relationship with the different operators. For some of the assets, it has the power to decide on possible reforms and renovations of the systems, for example, to minimize environmental impacts or reduce consumption. For other assets, it is the operators who make these decisions directly and carry out these reform processes. In any case, Azora strives to maintain a close relationship with the operators, monitoring performance in terms of energy consumption,



water and waste management, and coordinating with them to integrate efficiency measures into the equipment and devices, and communicating the relevance of sustainability to end user.

Lessons Learned

To improve its GRESB score and to answer the performance questions in a more standardised and reliable way, Azora built its data collection tool with the support of an external data advisor. The tool allows them to:

- collect consumption data from its assets through a semi-automatic data collection interface (buildings, meters, consumption);
- compare and visualise data in an integrated and automated manner;
- export custom reports;
- calculate the carbon footprint;
- create the respective forms to report the quantitative data to GRESB;
- analyse different scenarios about climate change depending on the location of the assets.

All this has increased the GRESB 'Performance' score, significantly improving the water, waste and emissions sections.

Managers like Azora have been affected by the stakeholder pressure for sustainable growth:

- growing general interest of investors about sustainability;
- banks, which are changing their financing models to favour more sustainable credits;
- the new consumer and tenant profile;
- the appearance of new technological solutions;
- the extensive regulatory development that is expected in the coming years.

This leads to the sector being transformed to face the new challenges related to sustainability, such as the urgent reduction of the environmental footprint that encourages the application of asset decarbonisation measures.

Azora believes that an integral part of its fiduciary responsibility lies in the responsible management of capital. They aspire to manage their investments in a more sustainable manner and under the highest corporate governance standards to have a positive impact on the environment and on people's lives. Using a sustainability benchmark like GRESB, is essential to achieve these objectives because it allows managers to measure progress in absolute terms and against comparable portfolios while at the same time providing a tool for reporting those results to all stakeholders in a clear and standardised way.

CASE STUDY CBRE IM

Putting Sustainability into Action

This case study explores how sustainability can be put into action and fully integrated within a company to meet the evolving and growing needs and requirements.

For CBRE Investment Management (CBRE IM) sustainability is fundamental to driving long-term outperformance and is therefore embedded throughout the investment process, from acquisitions through asset management. Recognising the need for accelerated action, in the last two years, CBRE IM enhanced its ESG integration by developing innovative tools and processes, creating a broader accountability structure, and increasing sustainability fluency across the global organization.

CBRE IM is a leading global real assets investment management firm. Through its investor-operator culture, the firm seeks to deliver sustainable investment solutions across real assets categories, geographies, risk profiles and execution formats so that its clients, people and communities thrive. CBRE IM is a signatory to the Principles for Responsible Investment (PRI), the Net Zero Asset Managers initiative (NZAMi) and the Task Force on Climate-related Financial Disclosures (TCFD). The firm participated in the original GRESB pilot in 2009 and for the last three years submitted the largest number of real estate portfolios for the GRESB assessment of any asset manager.

Integrating Sustainability Tools

Key performance indicators for measuring success are based on globally recognised sustainability frameworks such as GRESB, PRI, INREV, CRREM, BREEAM and LEED. Beyond these industry standards, CBRE IM developed proprietary tools to help the organisation measure progress, identify improvement opportunities and provide asset level recommendations.

Some of the tools the team developed for the firm's direct real estate investment strategy include:

- Acquisitions Tool: Enabling Investment Committees to evaluate ESG risk in a consistent way across the global platform using key asset data
- ESG Asset Analytics – Bottom Performers: Providing analytics to allow teams to focus and prioritize efforts on resource-intensive assets
- Portfolio ESG Scorecard: Showing the portfolio's progress on ESG targets
- Portfolio KPI Tool: Calculating and populating the INREV-aligned KPI performance tables

ESG Mailbox and Knowledge Center

CBRE IM established a centralised process and dedicated team of writers with ESG expertise to handle sustainability-related requests for information and firm-level reporting (i.e., PRI and TCFD). This streamlined process ensures that all requests are addressed, there is no duplication of effort and responses are globally consistent and aligned with the firm's reporting and signatory commitments. This process allows the Sustainability Team to focus on the high value work of supporting investment teams implement initiatives, presenting to clients, creating pathways to net zero and continuing to innovate new processes and tools.

Sustainability-related requests are triaged based on deadlines and whether the request is for a live mandate or for routine reporting. The dedicated team responds to each request or forwards it to the appropriate person (e.g., a Sustainability Team member, an external fund ESG consultant, the Legal and Compliance Team or another subject matter expert).

The firm's Knowledge Center database houses slides and RFP responses, which are updated on a regular basis. Those who are responding to RFPs and DDQs or who need sustainability language have access to the Knowledge Center database and can quickly find responses to questions, graphics, tables, organisation charts, biographies, and

presentation slides among other frequently used information. The ESG Mailbox, the dedicated team of ESG writers and Knowledge Center allowed the firm to complete nearly 800 sustainability-related requests and reporting projects in 2022 (a 400%+ increase from 2020).

Accountability for Sustainability

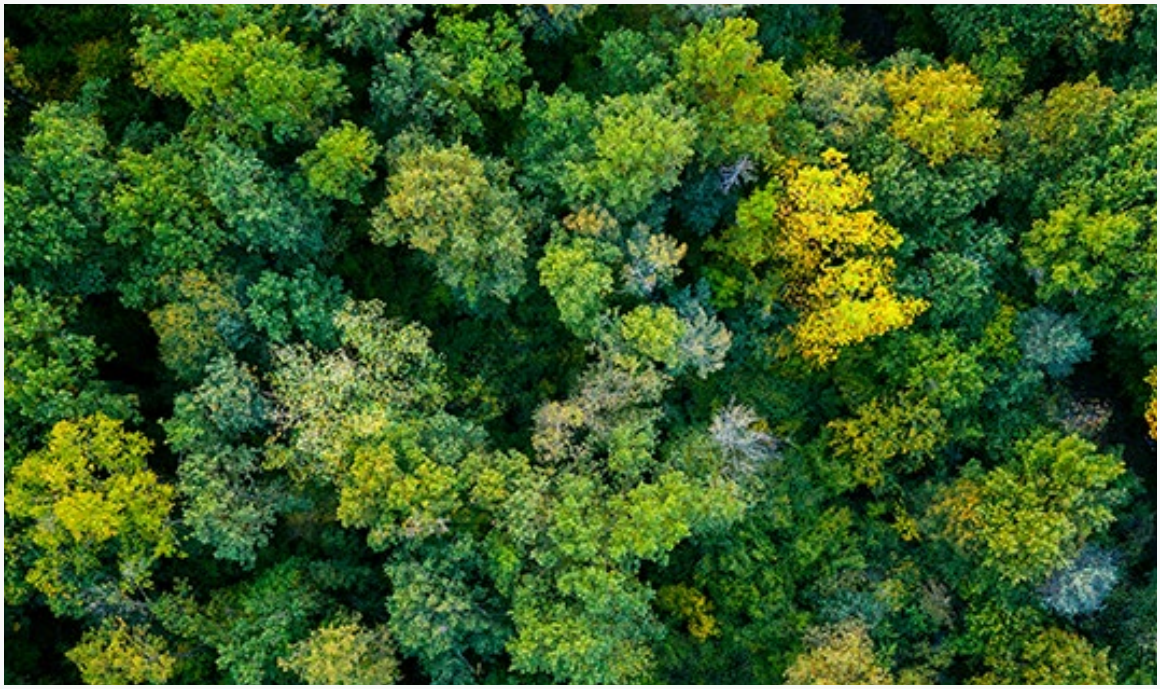
Accountability for sustainability begins at the top with responsibility and oversight sitting with CBRE IM's Executive Committee (EXCO). The Head of Sustainability and Innovation is an EXCO member and has the overall responsibility for the direction and implementation of sustainability. A senior member of the Sustainability Team is also a voting member on all Investment Committees.

CBRE IM's Global Sustainability Council is responsible for providing strategic direction for investment and operational sustainability, and five Sustainability Committees—covering corporate operations, direct private real estate, indirect private real estate, private infrastructure and listed securities—provide guidance to leadership and investment teams with respect to ESG best practices.

Having the right people in the right positions is key to the successful design and implementation of sustainability initiatives. CBRE IM's Sustainability Team are engineers and sustainability experts with the technical skills needed to address critical ESG challenges like climate change. Eleven fully dedicated sustainability professionals support the firm and strategy investment teams as well as develop proprietary tools to help measure and monitor ESG risk and progress.

To further integrate sustainability knowledge across functions, sectors and geographies, CBRE IM appointed and trained 80+ Sustainability Ambassadors (representing over 8% of firm employees) throughout the organisation to drive ESG integration within their respective function and educate their colleagues on how they can contribute to the firm's achievement of meaningful targets that will move the needle in the real estate industry.

CBRE IM took efforts to increase sustainability fluency further by creating a Sustainability Knowledge Hub on the intranet with tools, resources, trainings, short videos and webinar recordings available to all employees.



4. BUILDING CERTIFICATIONS

4. BUILDING CERTIFICATIONS

4.1 Status quo

The 2022 GRESB Real Estate Reference Guide[20] lists 96 design and/or construction schemes and 85 operational green building certification schemes. Following the launch of BREEAM in 1990 and LEED in 2000, the number of building certifications has grown rapidly globally to address national priorities and broader issues, with little consolidation to be expected. New certifications (e.g., ActiveScore) have developed to also cover impacts outside the building (e.g., people travel to the building and the associated environmental and health impact) which some current certification frameworks do not necessarily cover. In this chapter, the report provides an overview of the building certifications most widely used in the markets within this study's scope.

Building certifications are useful market instruments for measuring ESG factors in the construction or operation of a building. Whether state-driven (e.g., in Japan, Australia, Singapore) or company-driven, certifications can be used to measure a (theoretical or modeled) footprint and to track progress of reaching an ESG goal over time, while others primarily measure the energy and other sustainability attributes of a building in operation. Their use is considered an important ESG implementation KPI by reporting standards such as SASB, INREV, EPRA or the GRESB assessment.

They can identify areas for improvement against the benchmark of the underlying standard and largely represent a form of third-party assessment. In some countries, building certifications are incorporated in local building codes, while the certifications themselves are unregulated. In the context of increasing national and supranational regulations that define the building standards that must be met, the standards underlying the certification must be higher than the legal standard, to remain relevant and help advance the industry making the built environment more sustainable.

Building certifications may contain prescriptive elements that have to be met, for example prerequisites for building components. These often apply to 'in build' certifications for construction projects. 'In use' certifications relating to the operations and maintenance of the building can have performance-based criteria to measure defined (theoretical or modeled) results for different project types. Some 'in use' certifications have outcome-based criteria, meaning that the actual performance, such as energy use is measured against the target energy use level.

Consequently, it is very important to differentiate between in use certifications to measure theoretical (modeled) or actual ongoing performance and in build certifications to measure construction standards or future embodied carbon.[21,22]

4.2 Certifications as an instrument for measuring a footprint

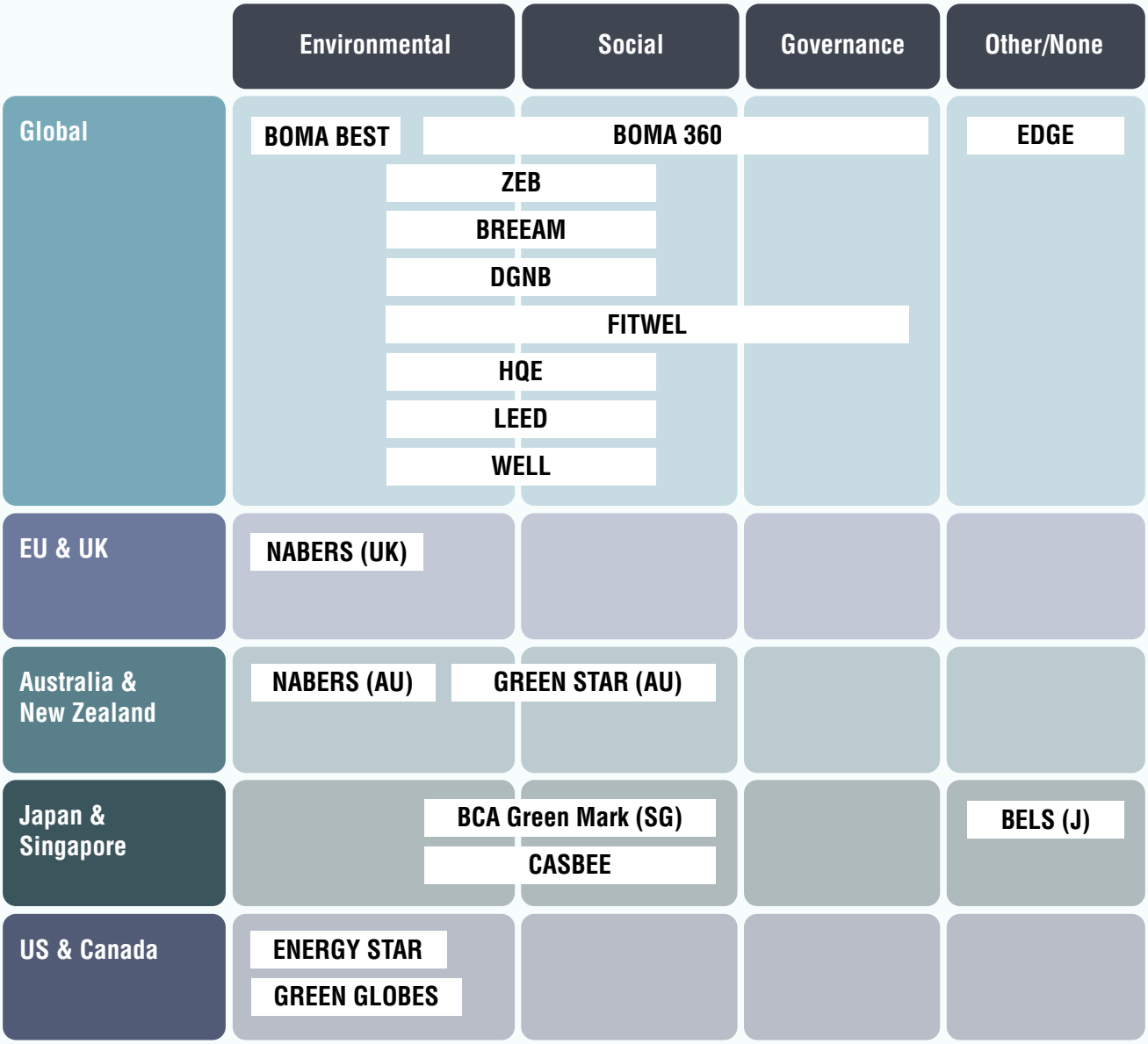
Buildings have significant direct and indirect impacts on the environment. During their construction, use, renovation, reuse, and deconstruction, buildings use energy, water, and raw materials, generate waste, and produce emissions. They also have social impacts, for example, on the health and wellbeing, and safety of their occupants and the community.

Building certifications can measure these environmental and social impacts through a single attribute assessment (e.g., NABERS, ENERGY STAR), or a multi-attribute assessment of an entire project (e.g., BREEAM, LEED). The latter is mostly used, aiming to reduce the overall impact on health and safety and/or the environment. Different project types (e.g., sectors and life cycle phases) are measured against different attributes.

Figure 27 shows the ESG factor coverage of each certificate in different regions.

Further, with physical climate risks coming more into focus, 'resilient by design' approaches and resilience principles for different phases of the asset lifecycle are being considered in the development of certifications such as LEED and RELI.[23] However, measuring actual energy use is needed as a complementary measure to ensure the green use of a building, for example to measure and minimise energy consumption. Smart meters can be helpful in this respect to identify the most cost-effective ways to reduce energy consumption. The importance of (smart) metering is emphasised by the disclosure requirements on implementation used by SASB.

Figure 27: Thematic spread of certifications



4.3 Certifications as third-party assessments

Generally, building certifications have long been used to provide marketable evidence of having a 'green building'. Given the rapidly growing focus on net zero, measuring actual ESG performance as opposed to theoretical (modeled) performance becomes more important.

Whilst a common definition of a green building does not yet exist, clear governmental commitments have been made in the Paris Agreement, thus placing the built world as a significant (outcome-based) contributor towards achieving those climate goals.

Following the announcement of the EU Green Deal to decarbonise buildings in Europe by 2050,[24] emission targets were set for 2030:

'The Commission proposes that as of 2030, all new buildings must be zero-emission. […] When it comes to renovations, new EU-level minimum energy performance standards are proposed, requiring the worst-performing 15% of the building stock of each Member State to be upgraded from the Energy Performance Certificate's Grade G to at least Grade F by 2027 for non-residential buildings and 2030 for residential buildings.'

The responsibility rests on governments to introduce legislation and regulations for green construction and renovation. Energy performance certificates as also referenced by the EU Taxonomy (see 2.2.3) are the

regulator's choice in the EU for measuring the output for the single attribute energy and defining sustainability. They are regulated by law[25] and controlled by the metering chain, making any misrepresentation less likely over the long-term.

Some building certifications measure multiple attributes and generally require the disclosure of data and documentation for assessment to third-party auditors or assessors and thereby provide a more reliable instrument for verifying building standards than an in-house assessment. However, as noted in the introduction to this chapter, building certifications are generally not regulated and are only as reliable as the third party is independent in performing the assessment. Potential conflicts of interest must be excluded.

In summary, building certifications can have a role to play in the decarbonisation process of buildings, although the interpretation of a certified building as a 'green building' is no longer valid. Building certifications, especially those focused on actual operational performance, can contribute to achieving a company's decarbonisation and wider building sustainability targets.

4.4 Certifications in the context of reporting

The coverage of buildings with building certifications is a recurring implementation metric for real estate-specific reporting standards, as defined by SASB, INREV and EPRA, to enable progress tracking. The disclosure is also required by GRESB as a benchmark for topics not covered by the GRESB assessment (see case study Azora - GRESB) to avoid duplication.

Building certifications 'in use' that look at actual ongoing performance data and are subject to regular recertification, such as BREEAM in use, US ENERGY STAR, or NABERS Australia, can be an important instrument for defining a sustainability strategy or sustainable investment definition in alignment with regulations such as the SFDR or national and sub-national regulations in other countries.

In practice, data used for building certifications is not extracted for reporting purposes, as building certifications represent a secondary source of data. They should consequently be viewed as market instruments next to, but not linked to, reporting.

CASE STUDY MANULIFE IM

Developing in-house sustainable building standard

As global sustainability initiatives have evolved rapidly, so too have the sustainability commitments at Manulife Investment Management (Manulife IM). Across Manulife IM's real estate capabilities, a real estate sustainability framework has been developed that helps drive sustainability across its businesses.

To assess sustainability performance across its global real estate platform, Manulife IM needed a single set of metrics. While there were several green building certification programs to choose from, it couldn't find one that benchmarked their assets globally—from Japan to Australia to the United States to Canada—nor was there a single platform to collectively advance Manulife IM's expectations across all of the sectors—office, residential, retail, and industrial. As a result, Manulife IM took it on itself to develop its own in-house set of standards.

Developing proprietary standards to address unique sustainability requirements

Manulife IM's Sustainable Building Standards (SBS) were initially developed in 2017 and act as a guide to advance sustainability within all buildings globally. The standards define requirements and best practices for Manulife IM's third-party property managers and encourage improvement while addressing the need for advancement, guidance, tools, and consistency. Manulife IM's standards allow them to:

- Meet industry and stakeholder expectations such as supporting requirements for certifications, GRESB, and PRI

- Drive leadership across their five sustainable real estate commitments
- Enable benchmarking of sustainability performance and understanding of business outcomes
- Provide tools and resources for third-party property managers

Ensuring sustainability practices are upheld by third-party property managers

Recently, Manulife IM migrated its North American real estate platform to third-party property management to oversee the operation of its buildings. To ensure its sustainability practices are upheld, Manulife IM includes Sustainable Building Standards in its property management agreements. It provides guidance documents, tools, and training to property managers, it requires annual reporting on progress, and it uses the standards to benchmark the performance of third-party property managers.

Incorporating sustainability into the management process

As part of Manulife IM's Sustainable Building Standards, property teams are required to report on their progress against minimum requirements and advancement initiatives on an annual basis. This information is then consolidated and shared with asset managers so that all teams involved are aware of and in alignment with the greatest sustainability risks and opportunities that are present.

To further integrate the standards into the management process, Manulife IM aligned the annual reporting process to occur before the annual budget cycle for properties. This allows time for asset managers to include opportunities for sustainability improvements in their annual planning.

Programme outcomes to date

Since launching the SBS in 2017, Manulife IM has seen considerable success in advancing sustainability across its global real estate portfolio. The standards have provided quantifiable performance tracking: across the portfolio, properties complete an annual report card against the standards which Manulife IM uses to track SBS performance year over year.

The standards have allowed for greater alignment with external industry best practices, enabling teams to achieve building certifications and reporting requirements. The standards have also provided teams with tools and resources to effectively track and manage their environmental performance, which has supported Manulife IM in meeting its real estate portfolio-level targets.

Having an annual reporting process and aligning it with budget processes has also allowed for continuous improvement. Since its initial launch,

there has been a 45% average increase in SBS scores across Manulife IM's global real estate portfolio.

Incorporating a strategic review process ensures standards are agile

Manulife IM's SBS need to reflect changing industry requirements and market evolution; as such, a regular review of the alignment with Manulife IM's sustainability strategy and goals takes place. This includes creating additional requirements, consolidating and creating tools and resources, and delivering stakeholder training. As part of the review process, some standards get upgraded to expected best practices.

For example, to support its ambitious sustainability targets, Manulife IM recently increased its waste diversion standard minimum from 50% to 65% for properties where waste management is controlled by the property manager. It also removed utility tracking as a requirement, as this is now broadly implemented and standard practice across its portfolio.

Recognising the importance of alignment with third-party certifications

Using third-party certifications such as LEED, NABERS, CASBEE, BOMA BEST, Fitwel, WELL, and ENERGY STAR is an important part of advancing asset stewardship. To meet the sustainability targets and market expectations, Manulife IM has recognised the importance of aligning its SBSs to industry-leading certification programs and requirements. This alignment has helped Manulife IM achieve high certification rates across its portfolio; for example, as of 2021, 82% of Manulife IM's global real estate portfolio holds a third-party green building certification.

Staying ahead on sustainability

Manulife IM uses its standards to stay ahead of emerging sustainability topics. For example, when setting greenhouse gas (GHG) reduction targets for its real estate portfolio, Manulife IM was able to operationalise an advancement of these targets in a new standard called GHG management.

Manulife IM also plans to share its SBS on its website in the coming year to support broader industry engagement and collaboration.

Developing the climate change resilience SBS

Climate change is one of the greatest challenges we face today. For Manulife IM's buildings and their communities, climate change poses both physical and transitional risks. To help guard against these risks, over the last year Manulife IM developed its climate change resilience standard, also in response to the inclusion of climate risk and resilience questions by GRESB.

In 2020, Manulife IM began to assess its climate risk resilience. It used forward-looking, third-party climate risk data to evaluate its global real estate portfolio's exposure to physical climate and extreme weather risks. These risks include floods, sea-level rise, extreme windstorms, wildfire, heat stress, water stress, and earthquakes. Manulife IM also inventoried its entire real estate portfolio for property resilience—the presence of features and practices such as risk awareness, resilience management, emergency management, business continuity, and building attributes—that helps mitigate climate risks.

The results of this assessment led to the development of the climate change resilience SBS, which incorporates risk and resilience practices into property operations. The standard aims to enhance property resilience through a range of initiatives, including education, emergency planning, and resilience assessments and improvements. To support property teams with education and implementation of this new standard, Manulife IM provided training and a property resilience tool kit. The tool kit helps teams screen and prioritise resilience improvements based on their climate risk exposure and existing resilience measures and practices.

5. RATINGS AND SCORES

5. RATINGS AND SCORES

ESG ratings or scores are available on (listed) corporate and (non-listed) investment or investment-management level. Public ratings for listed instruments, for example equity and debt instruments, are generally in the spotlight for global securities fund managers, whilst non-public scores on investment and investment-management level have become industry-driven instruments in the real estate sector for inhouse benchmarking purposes.

The general purpose of a rating or score is to provide an opinion based on the rating provider's methodology and scoring model to help inform investment decisions or provide an in-industry benchmark. From an investor perspective, ratings and scores present an instrument that can be used in absence of available primary ESG data from the investment object or ability to process that data. From a governance perspective, they can inform an ESG strategy and help set internal targets for improvement.

Ratings for listed instruments

With increasing ESG regulations and reporting requirements, data availability is improving. Ratings for listed instruments are thus currently more relevant in markets with lower levels of ESG regulations, such as the Asian-Pacific market.

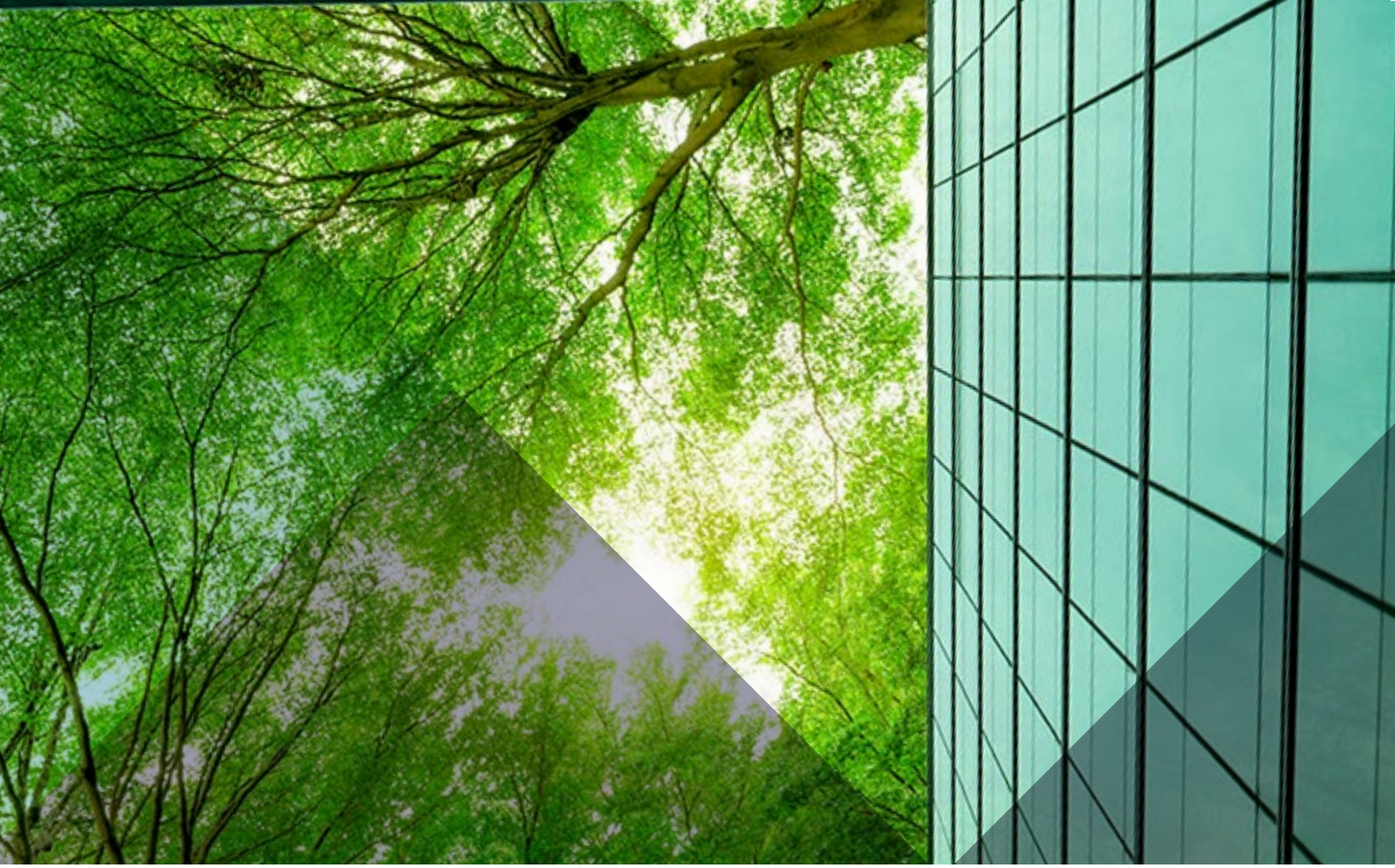
Given this development towards transparency, ESG rating agencies such as Sustainalytics, MSCI, Dow Jones, Moody's or S&P Global have begun acting as data (estimate) providers for data that is not yet available to fulfil obligations such as SFDR reporting. However, the rating agencies are coming under scrutiny by regulators such as the EU Commission[26] and ESMA[27] as well as watchdogs such as IOSCO[28] and SEC[29] given their historic influence and the need to define a common legal baseline of what sustainability means to prevent greenwashing.

One has to bear in mind that ESG ratings for listed instruments are derived with different methodologies and are generally 'in industry', meaning that the best-performing company in a renewable energy sector may receive a similar score as the best performing company in the oil sector. Further, they focus more on policies than practices and actual data. Concerns have also been raised over conflicts of interest, methodology, data quality, and poor revision processes, thus calling into question the reliability of the rating results.[30]

Many rating agencies also focus on ESG controversies, such as events or practices of companies that have negative effects on the environment, people, or their governance. ESG controversies are used by many portfolio managers as part of their exclusion criteria, hence the whistleblowing function of the rating agencies as well as non-profit or non-governmental organisations (NGOs) such as the Business and Human Rights Resource Centre contributes to 'greener' investing. However, on a stand-alone basis, ESG controversies should be interpreted as evidence of poor ESG governance and risk management. In the reverse, a lack of controversies does not prove that a company has good ESG governance and risk management. More research into the available data is required to assess a company's exposure to and impact on sustainability risks.

Commercial ESG rating agencies will not necessarily assess the effect the company has on the environment or people, but more strongly reflect how industry-specific ESG risks affect the company, how the company responds to ESG risks, and ultimately, how this impacts the company's financial performance.[31] In this light, ESG ratings may be more relevant for debt instruments, as the long-term financial performance and therewith creditworthiness of the debt issuer is affected by ESG risks. As discussed in the section on double materiality (page 22), it is not possible to cleanly separate the inside and outside impact view of materiality given their long-term dependencies. But the ESG materiality is determined by the rating agency, which may or may not align with the investor's ESG strategy and materiality assessment and which can differ significantly between rating agencies.

Consequently, a comparison of several ESG ratings should be used as a starting point[32] for evaluating ESG performance, but with the improvement of ESG data availability through reporting, deeper due diligence is recommended. Similarly, as a listed company seeking to communicate an ESG ambition, the application of the most relevant materiality-based reporting metrics is recommended to strengthen the credibility of the company's commitment and provide transparency to various stakeholders.



6. KEY FINDINGS

6. KEY FINDINGS

Following an extensive mapping exercise along with numerous interviews with industry experts, this report provides a snapshot of the ESG reporting standards most relevant to the sector. This study examines the purpose of the different ESG requirements and the different intended users of the information. It explores how the requirements overlap and where there may be an opportunity to condense the ESG reporting burden. The study also offers suggestions for best practice in ESG reporting across the various case studies.

While the detailed study is set out in the rest of the report, 10 key findings are summarised below at a high level:

1. The evolving ESG regulatory and reporting landscape is complex and can be overwhelming. The sector must work together to successfully navigate the road ahead. Collaboration and a balance between 'quality' and 'quantity' should be the focus.

2. It is important to understand the purpose of the different ESG frameworks and standards and the intended user of the information, there is no one-size-fits-all standard. Although different standards will continue to exist in the future due to their different purpose and stakeholder needs, it is anticipated that there will be further consolidation and alignment of standards which have an overlapping purpose.

3. We have identified five main categories of ESG frameworks and standards which are fundamental to the integration of ESG across the sector:

    a. Core corporate standards

    b. Thematic reporting standards

    c. Sustainability regulation related requirements

    d. Real estate industry-specific reporting standards and benchmarking

    e. Principle-based commitments

4. The materiality approach defines the main characteristics of the ESG standards. While some standards have a focus on 'financial materiality', others on 'impact materiality'. There are also standards having both a financial and an impact materiality purpose, a so-called 'double materiality' approach.

5. Credible data (especially environmental and scope 1 to 3 GHG emissions data) is fundamental to 'science-based metrics and targets' across multiple disclosure requirements ('you can't manage what you can't measure'). In the absence of primary ESG data, third- party ESG ratings can be helpful, but it is important to understand the limitations of third-party ESG ratings.

6. Building certifications can also complement a successful ESG strategy, however as the regulatory landscape evolves, building certifications are feeling the pressure of staying ahead of regulation to retain their relevance. Following the Paris Agreement targets set and subsequent introduction of regulation across different regions, countries and cities, focus is shifting quickly to actual sustainability performance of a building. Some building certifications focus on actual operational performance, while others continue to focus on theoretical or modeled performance, along with other attributes of sustainable building construction, health and wellness, and other sustainability goals. Whilst a common definition of a green building is still missing, regulation plays a key role in assessing alignment with climate targets.

7. Certain social targets are more difficult to measure as they are based on norms and values, but legislation and regulation are increasing worldwide to harmonise social standards for organisations and their supply chains.

8. Good governance is fundamental to effective implementation and there is a high level of global alignment based on existing corporate governance requirements.

9. It is important to determine what is within an organisation's control. For areas outside an organisation's control, best practice for engagement with the wider real estate 'ecosystem' should be followed (e.g., collaboration between landlord and tenant where possible).

10. For the sustainability strategy to be successful, the leadership must focus resources on the ESG frameworks and standards most relevant to stakeholders and engage the entire organisation to minimise risk and maximise impact.

Of the 14 standards considered in this study, ten have real estate-specific metrics. Those standards that contain real estate-specific metrics provide tailored metrics that are easier to understand in an industry context. Often the materiality of topics was determined beforehand, and the assessment thereof should remain relevant and applicable, but the understanding of ESG and best practice is moving forward rapidly, so it is important for real estate companies to continue to monitor its material ESG factors, e.g., the current state of sustainable finance regulations.

The mapping study includes questions categorised as governance, thematic references (e.g., environmental, sustainability, social etc.) when the question's purpose relates to strategy, governance, compliance or risk management. Users of the mapping should be aware of the 'governance topics composition per standard' when observing a large proportion of indicators mapped as G e.g., TCFD and PRI.

The EU Taxonomy technical screening criteria provide the most ambitious benchmark, whereas the SASB (which informs Appendix B of the IFRS S2 exposure draft) should be treated as a minimum standard, while ambitions to meet the UN SDGs and the Paris Agreement increases. The impact of the EU Taxonomy remains to be seen, but it is expected to challenge current best practices. In contrast, the SFDR principal adverse impact indicators relevant for real estate are limited and raise the question whether the SFDR is fit-for-purpose for real estate investors or too focused on securities funds.

The EPRA and INREV Guidelines, on corporate and fund level respectively, interpret general ESG considerations and best practices in the context of the real estate industry and present useful frameworks. They align with other standards, but do not aim to represent full compliance with other standards and regulations.

Within the international community and the European Union, and also with a view to the individual nation-states, there are clear efforts to advance the implementation of ESG criteria in all economic sectors and branches in the short term. The regulatory innovations affect all sub-sectors of the real estate industry and its entire life and investment cycle. Many of the regulations are not harmonised and coordinated. This lack of harmonisation and partly still undefined legal terms pose a major challenge for many.

There is no one-size-fits-all reporting standard, either from a thematic perspective, or from a purpose perspective. This will not change in the short to medium term, as the field of ESG is so broad and complex that it will continue to evolve as scientific knowledge grows and social norms become more widely accepted. As a result, despite all consolidation efforts, reporting standards and frameworks will evolve, and new requirements will emerge. Accordingly, an organisation will need to choose the right standards and metrics that appropriately reflect the requirements of their ESG strategy and their overall environmental impact and to comply with minimum social standards throughout the entire real estate lifecycle in value and supply chains.

To help navigate the selection of different regulations and standards, based on regulatory requirements and a company's corporate and ESG strategy, we've created the below set of questions. Before considering the study results, a real estate organisation should ask itself these self-assessment questions and become aware of the core issues and areas that are anchored in the company's ESG strategy. Comparing the answers with the results as presented in Figure 16 (and Appendices A & B) with the mapping results, can help to select the required and appropriate standards and regulations.

Figure 28: Self-assessment questions for real estate managers and other real estate organisations

Self-assessment questions for asset and investment managers and other real estate organisations
In which jurisdiction do you operate? Where are your assets and where are your (target) investors?
Which regulation applies in those countries/regions? How is this relevant for your fund/company?
At which levels and in which areas do national and international regulations have an impact on your real estate organisation?
What stakeholders (type, geographic domicile, etc) do you have and what are their ESG-specific requirements?
What is your level of ambition? • Do you want to implement only the minimum market requirements (e.g., 'traditional' investment not aiming to meet any requirements beyond minimum compliance or be marketed as sustainable in any way - will this be acceptable to your stakeholders/investors)? • Do you want to set priorities that go beyond the minimum requirements (and be ready for future requirements in advance of their introduction where possible)? • Do you want to become a strategic leader in ESG in the real estate sector? (Sustainability focused asset manager/ developer/investor? 'Future-proof' the organisation/fund/assets where possible?)
What is the purpose of your ESG reporting? (define, describe, measure, manage, or a combination of these aspects)
Do you have a holistic ESG approach or a specific climate change/environmental focus?
Does your company have a predefined reporting timeframe? (e.g., annual, interim)
Do you have specific building level targets (e.g., theoretical (modeled)/actual sustainability performance user wellbeing, connectivity etc)?

LIST OF MAPPING ESG ABBREVIATIONS

API – Application Programming Interface

AU – Australia

BaFin – Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht) (Germany)

BELS – Building-Housing Energy-efficiency Labelling System (Japan)

BOMA – Building Owners and Managers Association

BOMA BEST – BOMA BEST Sustainable Buildings 3.0

BREEAM – Building Research Establishment Environmental Assessment Method

CapEx – Capital Expenditure

CASBEE – Comprehensive Assessment System for Built Environment Efficiency

CBI – Climate Bonds Initiative

CBRE IM – CBRE Investment Management

CDP – Carbon Disclosure Project

CDSB – Climate Disclosure Standards Board

CERDS – China Enterprise Reform & Development Society

CNMV – National Securities Market Commission (Comisión Nacional del Mercado de Valores)

CRREM – Carbon Risk Real Estate Monitor

CSRD – Corporate Sustainability Reporting Directive

DDQs – Due Diligence Questionnaire

DEI – Diversity, Equity and Inclusion

DGNB – German Sustainable Building Council (Deutsche Gesellschaft für Nachhaltiges Bauen)

DNSH – Do No Significant Harm

E – Environmental

EFRAG – European Financial Reporting Advisory Group

EPRA – European Real Estate Association

ESG – Environmental Social Governance

ESMA – European Securities and Markets Authority

ESRS – European Sustainability Reporting Standards

EU – European Union

EXCO – Executive Committee

G – Governance

GAAPs – Generally Accepted Accounting Principles

GDPR – General Data Protection Regulation

GHG – Greenhouse Gasses

GRESB – Global Real Estate Sustainability Benchmark

GRI – Global Reporting Initiative

HECF – Hines European Core Fund

HQE – High Quality Environmental Standard (Haute Qualité Environnementale)

IASB – International Accounting Standards Board

IFRS – International Financial Reporting Standards

IFRS S1 – IFRS General Requirements for Disclosure of Sustainability-related Financial Information

IFRS S2 – IFRS Climate-related Disclosures

INREV – European Association for Investors in Non-Listed Real Estate Vehicles

IOSCO – International Organisation of Securities Commissions

IoT – Internet of Things

ISSB – International Sustainability Standards Board

KPIs – Key Performance Indicators

LEED – Leadership in Energy and Environmental Design

Manulife IM – Manulife Investment Management

NABERS – National Australian Built Environmental Rating System

NFRD – Non-Financial Reporting Directive

NGO – Non-Governmental Organisation

NZAMi – Net Zero Asset Managers initiative

OpEx – Operating Expenditure

PRI – Principles for Responsible Investment

PV – Photovoltaics

PwC - PricewaterhouseCoopers

RFPs – Request for Proposals

S – Social

SASB – Sustainability Accounting Standards Board

SBTi – Science-Based Targets initiative

SDGs – Sustainable Development Goals

SEC – Securities and Exchange Commission (United States)

SFDR – Sustainable Finance Disclosure Regulation

TCFD – Task Force on Climate-related Financial Disclosures

UK – United Kingdom

ULI – Urban Land Institute

UN – United Nations

UNGC – United Nations Global Compact

USA – United States of America

WELL – WELL Building Standard

ZED – Zero Defect Zero Effect

Listed in Appendix:

ASEAN – Association of Southeast Asian Nations

BCA – Building and Construction Authority (Singapore)

CASBEE – Comprehensive Assessment System for Built Environment Efficiency (Japan)

CBM – Confidence-Building Measures

Cert-Tot – EPRA measure for total number of sustainably certified assets

Comp – Compensation

Emp – Employment

Eng – Engagement

EPC – Energy Performance Certificate

EPRA BPR – European Public Real Estate Association Best Practices Recommendations

EVG&D – Economic Value Generated and Distributed

FSB – Financial Stability Board

GHG-Int – Greenhouse Gases Intensity

ISP – Investment and Stewardship Policy

NACE – Statistical Classification of Economic Activities in the European Community (Nomenclature Statistique des Activités économiques dans la Communauté Européenne)

NCREIF PREA – National Council of Real Estate Investment Fiduciaries and Pension Real Estate Association

NZEB – Nearly Zero-Energy Building

OECD – Organisation for Economic Cooperation and Development

OO – Organisational Overview

PED – Primary Energy Demands

RE – Real Estate

RTS – Regulatory Technical Standards

SAM – Manager Selection Appointment and Monitoring

SME – Small and Medium-sized Enterprises

SO – Sustainability Outcomes

WACI – Weighted Average Carbon Intensity

Appendix A: Thematic spread of certifications

ESG factor	Ecological Aspects	Ecological Aspects	Ecological Aspects	Ecological Aspects	Ecological Aspects	Ecological Aspects	Ecological Aspects	Ecological Aspects	Ecological Aspects	Ecological Aspects	Ecological Aspects	Ecological Aspects	Ecological Aspects	Ecological Aspects	Social aspects	Social aspects	Social aspects	Social aspects	Governance
Certification	Energy	Energy	Energy	Energy	Water	Water	Indoor Environment	Indoor Environment	Indoor Environment	Indoor Environment	Materials	Materials	Materials	Materials	0	0	0	0	0
Name	Low Emissions	Energy efficiency	Renewable Energy	Electrical Demand	"Re-use /recycling"	Water consumption	Air quality	Acoustics	Thermal	Daylighting	Robustness	Materials reuse	Waste Management	Toxic Materials	Safety	Health	Architecture	Social responsibility	Governance
BCA Green Mark (SG)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	n/a	n/a
BELS (J)	n/a	n/a	n/a	n/a	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
BOMA 360	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
BOMA BEST	yes	yes	yes	yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BREEAM	n/a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	n/a	n/a
CASBEE	n/a	n/a	n/a	n/a	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	yes	no	no
DGNB	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	n/a	n.a
EDGE	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
ENERGYSTAR	no	yes	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
FITWEL	no	no	no	no	no	yes	yes	no	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes
GREEN STAR (AU)	yes	yes	yes	yes	yes	yes	yes	n/a	yes	n/a	yes	yes	yes	n/a	n/a	n/a	yes	n/a	n/a
HQE	yes	yes	yes	yes	n/a	yes	yes	n/a	yes	n/a	n/a	n/a	yes	n/a	yes	yes	n/a	n/a	n/a
LEED	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	n/a	n/a
NABERS (AU)	yes	yes	yes	yes	yes	yes	yes	n/a	n/a	n/a	n/a	n/a	yes	n/a	n/a	n/a	n/a	n/a	n/a
NABERS (UK)	yes	yes	yes	yes	no	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
WELL	yes	n/a	yes	n/a	n/a	yes	yes	n/a	yes	yes	no	n/a	yes	yes	yes	yes	yes	yes	no
ZEB	yes	yes	yes	yes	n/a	yes	yes	no	n/a	n/a	yes	yes	yes	yes	n/a	yes	no	yes	n/a

Appendix B: Overview of building certifications

Name	Link	Organisation	Country of origin	Year of first publication	Country/ies or region of application	Certified Projects ~ number (status quo 2022)
BCA Green Mark (SG)	https://www1.bca.gov.sg/buildsg/sustainability/green-mark-certification-scheme	Building and Construction Authority (Singapore Government Agency)	Singapore	2005	Singapore	n/a
BELS (J)	https://www.hyoukakyoukai.or.jp/bels/bels.html	Building Energy-Efficiency Labeling System	Japan	2016	Japan	160,801 (documented until FY 2021)
BOMA 360	BOMA 360 Performance Program	Building Owners and Managers Association International (BOMA International)	USA	2010	global (USA, Australia, Brazil, Canada, China, Costa Rica, Finland, Greece, Indonesia, Japan, Korea, Mexico, New Zealand, Panama, Philippines, Russia, South Africa & UK)	n/a
BOMA BEST	BOMA Canada	Building Owners and Managers Association of Canada (BOMA Canada)	Canada	2016	global	>7000
BREEAM	www.breeam.org	Building Research Establishment (BRE)	United Kingdom	1990	global	602,400
CASBEE	www.ibec.or.jp/CASBEE/english/	Japan Sustainable Building Consortium	Japan	2002	Japan (mostly, 99% in Japan, very few cases in oversea countries)	30,325 (documented until March 2021)
DGNB	www.dgnb.de	German Sustainable Building Council	Germany	2007	global	2,100
EDGE	https://edge-cert.org/	EDGE Certified Foundation	Switzerland	2009	global (actually in 50 countries and over 30 industries)	200 organisations 212 certificates
ENERGYSTAR	https://www.energystar.gov/buildings/building_recognition/building_certification	US Environmental Protection Agency	United States	1995	United States, Canada	Over 39,000 buildings as of the end of 2021

Name	Link	Organisation	Country of origin	Year of first publication	Country/ies or region of application	Certified Projects ~ number (status quo 2022)
FITWEL	https://www.fitwel.org/	U.S. Centers for Disease Control (CDC) Center for Active Design as the licensed operator	USA	2012	global (in 50 countries used)	1175 (certified or pending)
GREEN STAR (AU)	https://new.gbca.org.au/	Green Building Council Australia	Australia	2003	Australia (founded by the Australian Green Building Council) New Zealand (hosted by and licensed to the New Zealand Green Building Council)	>3,255 in Australia (documented until 2020)
HQE	http://www.hqegbc.org/batiments/certifications/	Association pour la Haute Qualité Environnementale	France	2002	global (North America, South America, Europe, Asia, Oceania; used in 24 countries)	1,095 (documented until 2021)
LEED	www.usgbc.org	United States Green Building Council (USGBC)	USA	1998	global	143,770
NABERS (AU)	www.nabers.gov.au	National Australian Built Environment Rating System (Governmental)	Australia	2001	Australia	4,314 (documented until 2021)
NABERS (UK)	https://bregroup.com/products/nabers-uk/	BRE Group	Australia	2020/2021	England, Wales, Scotland, Northern Ireland	n/a
WELL	https://www.wellcertified.com/certification/v2/	International WELL Building Institute	USA	2014	global (in more than 60 countries used)	>4,000
ZEB	http://www.env.go.jp/earth/zeb/index.html	International Living Future Institute	Japan	2016	global	n/a

Name	Auditing: Process, Accredited auditors /Professionals - required? ~ number and Y/N	Number of criteria/Prerequisites / Credits	Certificates / Level - Degree of Compliance [%]
BCA Green Mark (SG)	Assessment: - carried out by BCA's appointed assessors - review and verify of relevant reports and documentary evidence - conduction site verification upon project completion and issue of Green Mark certification Green Mark Accredited Professional Green Mark Advanced Accredited Professional Green Mark Accredited Professional (Facilities Management) Green Mark Advanced Accredited Professional (Facilities Management)	No criteria: 6 Prerequisites: yes (Mandatory Sustainability Requirements)	Green Mark Gold Plus / Platinum + SLE (super low energy) Green Mark Gold Plus / Platinum Green Mark SLE Mandatory Sustainability Requirements
BELS (J)	- third party certification system for energy performance - provides energy consumption data - evaluate building's energy saving efficiency - rewards the performance based on stars No accredited bodies: 123	It's mostly asking applicants to fill energy consumption and reward star base on calculated performance rather than meeting specific ESG indicators.	5 stars: BEI ≦ 0.80 4 stars: 0.80 < BEI ≦ 0.85 3 stars: 0.85 < BEI ≦ 0.90 2 stars: 0.90 < BEI ≦ 1.00 1 star: 1.00 < BEI BEI = Design Primary Energy / Standard Primary Energy Consumption
BOMA 360	- holistic approach by evaluating all major areas of operations and management BOMA 360 Ambassador: 39 Companies	No criteria: 6 No sub criteria: 40 Prerequisites: yes No of achievable points: 129	BOMA 360 designation when minimum requirements are achieved
BOMA BEST	- questionnaire or survey-based assessment - on-site verification conducted by a third-party - verification and subsequent certification are coordinated by a regionally designated Local BOMA Association.	No criteria: 10	Platinum: ≥90% Gold: 80-89% Silver: 50-79% Bronze: 20-49% Certified: ≤19% Degree of Compliance: >70%

Name	Auditing: Process, Accredited auditors /Professionals - required? ~ number and Y/N	Number of criteria/Prerequisites / Credits	Certificates / Level - Degree of Compliance [%]
BREEAM	- third party assurance Assessor: Y No: 23,360 Professional: Y/N (additional credits for involving) No AP´s: 15,440	No criteria: 57 Prerequisites: 15 No credits: 148	Outstanding: ≥85% Excellent: ≥70% Very Good: ≥55% Good: ≥45 Pass: ≥30% Certified (In-Use)
CASBEE	- CASBEE is a system in which a third party examines and certifies assessment results prepared and accompanied by an Accredited Professional via online tools. - provided online simulation tool for participants evaluates their building performance prior to submitting their official application - accredited bodies evaluate whether participant fulfills the CASBEE requirements - depending on the region the assets are located, there may be additional mandatory/voluntary requirements from the local government Third party evaluation bodies (companies/ association/ organisation): 13 (October 2021) No Accredited Professionals:10,108 (April 2022)	No criteria: 34 No sub criteria: 54	5 stars & grades: S: excellent A: very good B+: good B-: fairly poor C: poor
DGNB	- DGNB certification system available for whole life cycle (from planning, conversion, operation, renovation until dismantling) - evaluation of location, technical and procedural quality with a holistic approach - independent auditors Auditor: Y No: 750 Professional: Y/N (additional credits for involving AP´s) No Professionals: 1,310	No criteria: 38 Prerequisites: 2 Credits: ca. 500 with different weightings depending on the scheme	Platin: ≥80% Gold: 65-80% Silver: 50-65% Bronze (In-Use): <50% Diamond
EDGE	third-party verification via licensed, independent certification bodies online tool based self-assessment professional	4	3 Level based on certified or not

Name	Auditing: Process, Accredited auditors /Professionals - required? ~ number and Y/N	Number of criteria/Prerequisites / Credits	Certificates / Level - Degree of Compliance [%]
ENERGYSTAR	Certification is given on an annual basis, so a building must maintain its high performance to be certified year to year. The information submitted in the certification application must be verified by a licensed Professional Engineer (PE) or Registered Architect (RA) to be eligible for approval.	No criteria: 1 - Meet the definition of one of the eligible property types. - Receive an ENERGY STAR score of 75 or higher, accounting for all energy use on the entire property. - Be located in the United States, U.S. territories, or owned by the U.S. government; or be located in Canada.	https://www.energystar.gov/buildings/building_recognition - ENERGY STAR Certification for Buildings - Designed to Earn the ENERGY STAR - ENERGY STAR Tenant Space
FITWEL	-Process: Register, Evaluate, Benchmark, Submit, Review, Certification - assessment of the project through two independent reviewers - confirmation of a numerical score No of global users 7,200	No criteria: 12 No sub criteria: 73 No credits: 144	3 stars: 125-144 points 2 stars: 105-124 points 1 star: 90-104 points
GREEN STAR (AU)	- third-party verification - ISO 9001 accreditation - independent assessor within certification body - accredited professional	No criteria: 30 +sub criteria	6 stars: world excellence 5 stars: Australian excellence 4 stars: best practice 3 stars: good practice 2 stars: average practice 1 star: minimum practice
HQE	- third-party verification -on-site verifications - independent accredited auditors	4 themes No criteria: 14 +sub criteria	9-11 stars: excellent 5-8 stars: very good 1-4 stars: good No stars + all of the prerequisites: pass

Name	Auditing: Process, Accredited auditors /Professionals - required? ~ number and Y/N	Number of criteria/Prerequisites / Credits	Certificates / Level - Degree of Compliance [%]
LEED	- on-site visits for verification - LEED Green Associate - LEED Accredited Professional (AP) No APs worldwide: 169,776	No criteria: 41 (+5 Reginal Priority) Prerequisites: 12 Credits: 110	80+ points: platinum 60-79 points: gold 50-59 points: silver 29-40 points: certified
NABERS (AU)	- NABERS Accredited Assessors are accredited by NABERS through the NSW Department of Planning, Industry & Environment (DPIE), but operate independently - on-site verifications through the accredited assessors to verify the data and calculate the rating - submission of the data to the NABERS Technical Team to carry out an audit of the information before to certify the building with the final rating Assessor: Y No 563	No criteria: 4	6 stars: market leading 5 stars: excellent 4 stars: good 3 stars: average 2 stars: below average 1 star: making a start
NABERS (UK)	- NABERS UK Licensed Assessors are licensed after completing the NABERS UK Assessor Training - on-site verifications through the licensed assessors to verify the data - NABERS Technical Team will carry out an audit of the information before certifying the building with the final rating Assessor: Y	Minimum Requirements: yes	6 stars: market leading 5 stars: excellent 4 stars: Good 3 stars: market average 2 stars: below average 1 star: poor
WELL	- verification through documentation and site visits - an accredited WELL Assessor (AWA) completes the visual assessment - third-party verified by GBCI No of WELL APs: 11,426	No criteria: 108 (108 features within 10 concepts)	80 points: WELL platinum 60 points: WELL gold 50 points: WELL silver 40 points: WELL bronze
ZEB	- third party certification system for energy performance	n/a	10 points achievement list to be certified

Name	Building type Project phases for the assessment	Type of use (e.g., office, residential, logistics etc.)	Weight of ecological aspects	Consideration of prechains
BCA Green Mark (SG)	New buildings New non-residential buildings New private and public residential developments Existing buildings in operation pre-assessment (optional) assessment stage (design and completion) verification stage	Residential Commercial: office, retail, hotel Others (Industrial buildings, Institutional buildings, Schools, Hawker centres, Healthcare facilities, Laboratory buildings, new rail or light rail stations such as MRT Stations)	ca. > 80% (Climatic responsive design, Building energy performance, Resources stewardship, Smart and healthy building, Advance green efforts)	yes
BELS (J)	New building - Design Stage New building - Constructed Stage Existing building - Performance Evaluation pre-certificate possible in/after planning phase	All typologies	n/a	n/a
BOMA 360	Existing buildings	Commercial Office Others (corporate facilities, government buildings, medical office buildings, mixed-use buildings, industrial buildings)	ca. 22% (29 points)	yes
BOMA BEST	Existing buildings	Commercial Office Others (Shopping Centre, Universal buildings, Light Industrial, Open Air Retail buildings, Health Care)	n/a	n/a
BREEAM	New construction Refurbishment & fit out In-use for existing buildings in operation Communities pre-certificate possible in/after planning phase final evaluation after completion	Residential Offices Retail Industrial Others (Education, Transportation hub, Hospitality, Community, Sport and leisure facilities, Government services)	ca. 30%	yes

Name	Building type Project phases for the assessment	Type of use (e.g., office, residential, logistics etc.)	Weight of ecological aspects	Consideration of prechains
CASBEE	Pre-Design, New Construction, Existing Buildings, Renovation	all typologies Residential Office	high	n/a
DGNB	Building Design + Construction Operations + Maintenance Neighborhood Development Interior Design + Construction Homes pre-certificate possible after planning phase (interim certificate) final evaluation after completion (final certificate)	Office Residential Hotel buildings Logistic buildings Others (Shopping centers, Education buildings, Department stores, Healthcare building, Laboratory buildings, Mixed use, Multistorey car parks, Production buildings, Sport halls, Consumer market buildings, Buildings used for meetings / assemblies / gatherings, Districts, Interious)	22.50%	yes
EDGE	New buildings, existing buildings, renovations	Office Residential Retail Others (Hospitality, Hospitals, Warehouses, Light Industry, Education)	No (as the scheme is a pure assessment methodology for Governance)	No (as the scheme is a pure assessment methodology for Governance)
ENERGYSTAR	New Construction (Designed to Earn the ENERGY STAR) Existing Buildings (ENERGY STAR Certification) Existing Tenant Space (ENERGY STAR Tenant Space)	Bank Branch (U.S.), Convenience Stores (U.S.), Courthouse (U.S.), Data Center (U.S.), Distribution Center (U.S., Canada.), Financial Office (U.S., Canada), Hospital (General Medical & Surgical) (U.S., Canada), Hotel (U.S., Canada), Ice/Curling Rink (Canada), K-12 School (U.S., Canada), Medical Office Buildings (U.S., Canada), Multifamily Housing (U.S., Canada), Non-Refrigerated Warehouse (U.S., Canada), Office (U.S., Canada), Refrigerated Warehouse (U.S., Canada), Residential Care Facility (Canada), Retail Store (U.S., Canada), Self-Storage (Canada), Senior Living Community (U.S., Canada), Supermarket/Grocery Store (U.S., Canada), Wholesale Club/Supercenter (U.S., Canada), Worship Facility (U.S.)	100%	no

Name	Building type Project phases for the assessment	Type of use (e.g., office, residential, logistics etc.)	Weight of ecological aspects	Consideration of prechains
FITWEL	New Construction & Existing buildings Design Certification (prior to occupancy) Built Certification (post occupancy)	Retail Multifamily Residential Others (Workplace, Senior Housing, Community Site, Commercial Site, Industrial Site)	ca. 5%	no
GREEN STAR (AU)	Green Star Buildings Green Star - Design & As Built Green Star Communities Green Star Interior Green Star Performance Green Star homes	Retail Residential Offices Others (school, universities, industrial facilities, public buildings, hospitals)	high	n/a
HQE	Buildings under Construction Existing Buildings in operation or Refurbishments Urban planning and development	All typologies (residential, commercial, administrative, service buildings)	high	yes
LEED	New construction Interiors Renovations Existing commercial buildings Urban areas pre-certificate possible after planning phase final evaluation after completion	Office Retail Schools Others (Data Centers, Warehouses and Distribution Centers, Hospitality, Healthcare)	ca. 57%	yes
NABERS (AU)	New construction Renewing	Residential Office Hotels Others (Shopping center, Data center, Hospitals, Warehouses, Cold Stores)	100%	n/a
NABERS (UK)	New Construction (Design for Performance) Existing buildings (NABERS Energy)	Office buildings	100%	no

Name	Building type Project phases for the assessment	Type of use (e.g., office, residential, logistics etc.)	Weight of ecological aspects	Consideration of prechains
WELL	New/Existing Buildings New/Existing Interiors and Core + Shell	**Optimized for:** Commercial and institutional office buildings **Pilot programs for:** Retail Multifamily residential Education Restaurants Commercial Kitchen	medium-low (focus lies on social aspects, mostly on well-being)	yes
ZEB	New construction and existing buildings Interior projects Core green building certification Zero Energy Zero Carbon	n/a	high	n/a

Appendix C: Individual analysis reporting standards

1. Global Reporting Initiative (GRI)

Key data	Description
Full name of standard	GRI Sustainability Reporting Standards
Category of standard	Core corporate standard
Type of standard	Corporate
Application	Voluntary; all private or public enterprises
Stakeholder	Multi-stakeholder
Reporting mechanism	Issue own sustainability report and inform GRI
Geographical application	Global - more than 10,000 GRI reporters in over 100 countries
Structure	GRI Universal Standards, GRI Sector Standards, and GRI Topic Standards
Purpose	The GRI Standards help organisations understand their outward impacts on the economy, environment, and society, including those on human rights. This increases accountability and enhances transparency on their contribution to sustainable development.
Real estate specific	New sector standard planned; GRI G4 Construction and Real Estate Sector Disclosures (2014) have been transitioned to GRI Standards.
Source of data	Organisation, supply chain
Types of disclosure	operational, science-based, qualitative, financial
Version	Individual standards range from 2016-2022
Issuing body	Global Reporting Initiative (GRI) is an independent, international organisation based in Amsterdam, Netherlands.
Scope of mapping	General and topic standards (GRI 200-418)
Additional information	GRI is advising EFRAG on CSRD and IFRS S1/S2 on S-Standards
Link	https://www.globalreporting.org/

Overview of metric mapping

	Define	Describe	Manage	Measure	Grand total
E - Climate mitigation	37		1	39	**77**
E - Climate adaption	1			4	**5**
E - Pollution prevention	3		4	21	**28**
E - Circular economy			1	4	**5**
E - Water	3		8	24	**35**
E - Biodiversity	1	6	13	6	**26**
S - Health & Safety	17	7	24	25	**73**
S - Community impact	3		2	13	**18**
S - Employees	6	7	9	21	**43**
G - Governance			1		**1**
G - Compliance		8	19	25	**52**
G - Strategy					
G - Risk management			4	5	**9**
G - Economic information	2		3	18	**23**
G - Sustainability					
G - Environmental	2		1		**3**
G - Social					
Grand total	**75**	**28**	**90**	**205**	**398**

Standard description

The GRI Standards have a comprehensive set of sustainability topics and a management approach, requiring the enterprise to disclose its impacts and practices for managing those impacts in detail (GRI 103). With nearly 400 KPIs, they offer a broad coverage of the E, S and G categories defined by this study and use a balanced mix of governance (manage) and quantitative (measures) KPIs, enhanced by clarity of definitions and descriptive disclosures.

An enterprise must report fully on the General Standards and the Topic Standards it has identified as material. A core or comprehensive approach can be used (GRI 101). The GRI standards have a comply-or-explain rule and an enterprise can only publish a report with a claim to full compliance if all disclosures can be made, otherwise the report can only claim to be compiled with reference to the GRI standards. If any such claim is made, the GRI must be informed of the report.

The GRI standards require detailed transparency on any definitions, calculations, scopes, sources of data, methodologies, or standards used.

The management approach also requires transparency on any 'controversies', such as legal disputes on e.g., corruption (GRI 205), anti-competitive behaviour (GRI 206) or marketing of products (GRI 417). It considers tax governance as part of good governance (GRI 207), including the processes for collecting and considering the views and concerns of stakeholders, including the approach to public policy advocacy on tax, beyond core tax compliance and assurance measures or avoidance of aggressive tax.

The management approach also considers public engagement, e.g., 'an explanation of the process for setting any water-related goals and targets that are part of the organisation's approach to managing water and effluents, and how they relate to public policy and the local context of each area with water stress' (GRI 303-1).

Beyond statistics, it requires transparency on whistleblowing mechanisms or raising awareness for e.g., workers' health and safety. GRI 403-2 requires 'a description of the processes for workers to report work-related hazards and hazardous situations, and an explanation of how workers are protected against reprisals'.

In terms of understanding the business, disclosures regarding the direct economic value generated and distributed (EVG&D) on an accruals basis are required, including the basic components for the enterprise's global operations. Where significant, EVG&D has to be reported separately at country, regional, or market levels, and the criteria used for defining significance (GRI 201-1). Further financial information on revenues, taxes, employees, operations and third-party relationships (GRI 207) is required to provide a context for understanding the enterprise's value chain. The value chain or supply chain is covered in a separate standard (GRI 414), but also in topic standards such as waste (GRI 306-1, 306-2).

The environmental objective of biodiversity (GRI 304) has been an established focus for what are emerging disclosures under other reporting standardseg, and planned updates to the standard have been open for public comment in Q1 2023.

2. Sustainability Accounting Standards Board (SASB)

Key data	Description
Full name of standard	Sustainability Accounting Standards Board
Category of standard	Core corporate standard
Type of standard	Corporate
Application	Voluntary (globally); informed industry-based requirements within IFRS S2 and referenced as a resource prepares can consider in IFRS S1; all enterprises
Stakeholder	Investor
Reporting mechanism	Can be used in separate report or integrated into other reports, e.g., annual report
Geographical application	Global, over 1,400 reporting and referencing companies (2021)
Structure	Available for 77 industries, the Standards identify the subset of environmental, social, and governance issues most relevant to financial performance in each industry via the SASB materiality matrix.
Purpose	SASB standards disclose sustainability information that is financially material – e.g., reasonably likely to affect the financial performance of an enterprise.
Real estate specific	Yes (Real estate, real estate services, home builders)
Source of data	Organisation, assets, tenants
Types of disclosure	Mainly operational, limited qualitative, science-based and financial metrics
Version	2018
Issuing body	SASB is a not-for-profit, independent standards-setting organisation based in San Francisco, USA. Issued by the Value Reporting Foundation (in connection with the Integrated Reporting Framework).
Scope of mapping	Real Estate, Real Estate Services, Home Builders standards. Mapping of the high-level accounting metrics and activity metrics within these standards, and does not map the more detailed disclosure requirements within each of these metrics.
Additional information	Integrated into the IFRS S1/S2 (under IFRS Foundation) in 2022
Link	https://www.sasb.org/

Overview of metric mapping

	Define	Describe	Manage	Measure	Grand total
E - Climate mitigation			2	15	**17**
E - Climate adaption				4	**4**
E - Pollution prevention					
E - Circular economy					
E - Water			1	9	**10**
E - Biodiversity					
S - Health & Safety				4	**4**
S - Community impact			1	4	**5**
S - Employees					
G - Governance					
G - Compliance					
G - Strategy					
G - Risk management					
G - Economic information				5	**5**
G - Sustainability				2	**2**
G - Environmental			4		**4**
G - Social					
Grand total			**8**	**43**	**51**

Standard description

The SASB materiality matrix identifies 26 issue categories mapped to 77 industries. Three different real estate-specific industries have been defined by SASB: real estate (mainly investment and asset managers), real estate services (e.g., property management or brokerage) and home builders (residential development). Of the issue categories, only a limited range are considered material for the real estate industries, with a focus on climate- and water-related KPIs.

- Real estate issues: 1) energy management, 2) waste and wastewater management, 3) product design and lifecycle management, 4) physical impacts of climate change
- Real estate services issues: 1) product design and lifecycle management, 2) business ethics
- Home builders' issues: 1) ecological impacts, 2) employee health and safety, 3) product design and lifecycle management, 4) business model resilience

Generally, the KPIs relate to implementation metrics (IF-RE-450a.1.), such as area of properties located in 100-year flood zones or water withdrawal coverage (IF-RE-140a.1.), complemented by energy or water usage metrics (IF-RE-130a.2., IF-RE-140a.2.).

The implementation of certifications is one focus point of the SASB standards, e.g., the number of homes delivered certified to a third-party multi-attribute green building standard (IF-HB-410a.3) or the percentage of eligible portfolio that (1) has an energy rating and (2) is certified to ENERGY STAR (IF-RE-130a.4).

Social topics are considered for the residential construction industry only, limited to construction metrics for e.g., infill, redevelopment sites or compact developments (IF-HB-410b.3.) as well as health and safety metrics, e.g.,ident and fatality rates for employees (IF-HB-320a.1).

Governance topics cover mainly environmental considerations in the lifecycle as well as economic information relating to revenues and monetary losses

as a result of legal proceedings for lack of professional integrity (IF-RS-510a.3) or environmental regulations (IF-HB-160a.3). Also, the real estate standard addresses the approach to measuring, incentivizing, and improving sustainability impacts of tenants (IF-RE-410a.3).

The SASB standards have been integrated into the IFRS S1/S2 as industry-specific standards with minimal adjustment for internationalization of the metrics. By applying the pre-defined industry materiality assessment and sustainability definition of SASB, whose methodology is not publicly disclosed, the governance of a company cannot be reliably assessed as it does not disclose its own materiality assessment and corresponding risk management. Thus, the SASB metrics should be complemented by general ESG metrics in the context of an overall individual materiality assessment.

3. European Association for Investors in Non-Listed Real Estate Vehicles (INREV)

Key data	Description
Full name of standard	INREV Guidelines
Category of standard	Real estate industry specific reporting standard
Type of standard	Fund/Portfolio level
Application	Voluntary; non-listed real estate vehicles
Stakeholder	Investors
Reporting mechanism	Annual and interim reports of vehicle and assets
Geographical application	EU and Asia Pacific
Structure	The sustainability reporting guidelines are part of the INREV Reporting module which is one of five Compliance modules, next to five Best Practice modules.
Purpose	The INREV sustainability reporting guidelines form a disclosure framework that delivers visibility and insight into a vehicle's ESG efforts. They aim to provide a coherent framework for ESG reporting in line with annual financial reporting and present a clear picture from the vehicle's strategy through reporting guidelines and environmental and social KPIs.
Real estate specific	Yes
Source of data	Organisation, vehicle, portfolio of assets, supply chain
Types of disclosure	Governance-based, implementation targets, science-based and financial metrics
Version	2023
Issuing body	European Association for Investors in Non-Listed Real Estate Vehicles, a member-driven organisation based in Amsterdam, The Netherlands
Scope of mapping	INREV Reporting module – Sustainability reporting guidelines
Additional information	Aligned with elements of GRESB, EPRA, GRI, PRI, TCFD, CRREM, NCREIF PREA and SFDR
Link	https://www.inrev.org/

Overview of metric mapping

	Define	Describe	Manage	Measure	Grand total
E - Climate mitigation				39	**39**
E - Climate adaption				9	**9**
E - Pollution prevention				10	**10**
E - Circular economy					
E - Water				7	**7**
E - Biodiversity				1	**1**
S - Health & Safety				9	**9**
S - Community impact				10	**10**
S - Employees				4	**4**
G - Governance			2		**2**
G - Compliance			1		**1**
G - Strategy			10		**10**
G - Risk management			1		**1**
G - Economic information					
G - Sustainability			8		**8**
G - Environmental			1	7	**8**
G - Social				13	**13**
Grand total			**23**	**109**	**132**

Standard description

The INREV Guidelines framework is designed for non-listed real estate vehicles for institutional investors and investment managers. Giventhe variety of non-listed vehicles, the INREV Guidelines provide a modular approach with best practice and compliance modules. The best practice modules consist of governance, liquidity, property valuation, code of tax conduct and sustainability modules. The compliance modules relate to reporting (including sustainability reporting guidelines), performance measurement, INREV NAV, fee and expense metrics, and data delivery.

The Sustainability module, which is a standalone best practice module, provides guidance on how to consider sustainability in strategy and target definition as well as investment and risk management processes for a real estate investment manager. The ESG strategy development is supported by a list of ESG factors and parameters. The governance and oversight framework required to achieve ESG goals is outlined, as are ESG risks and opportunities on real estate investment vehicle level and ESG integration into asset management activities.

The Sustainability reporting guidelines, as part of report, links the long-term ESG strategy of the vehicle to annual objectives and annual portfolio information – e.g., requires a defined action plan including quantifiable annual targets, which are then reported against. The 2023 version introduces a more comprehensive scope of KPIs, 109 in total (73 environmental, 36 social KPIs), of which 28 environmental KPIs are required for compliance. The scope has been enriched with the prominent ESG topics, such as climate change and social aspects. The two categories of KPIs cover 1) Required KPIs; data and disclosures of essential KPIs covering key attributes such as energy consumption, GHG, and other environmental measures, 2) Recommended KPIs; offering investment managers the ability to disclose different levels of detail based on their own capabilities and investor needs.

The guidelines and KPIs are referenced to GRI, TCFD, CRREM GRESB, EPRA, NCREIF PREA and SFDR to reduce the reporting burden. The most suitable KPIs from the perspective of a real estate investor within an annual reporting context were chosen, with a much deeper

coverage of the environmental KPIs and the introduction of a range of social topics.

This approach is both governance-focused and target-focused. An additional perspective provided by the new Sustainability Reporting module is the financial impact of climate change on the portfolio, thus interpreting the TCFD in a real estate context. This approach offers both a financial materiality as well as an impact materiality perspective for the reader of the annual report. Another example of how existing data was translated to the investor perspective is a KPI relating to the scenario pathway targets (ENV47, 48, 49), requiring the disclosure of the results and strategy of using a methodology, such as CRREM.

The comprehensive long-term ESG strategy requirements also specifically address the identified environmental objectives and the supply chain management strategy.

Implementation targets relate to green building certificates and energy ratings, including the current state, the certification scheme(s) and ambitions (RG72). Another example of an implementation target relates to green lease clauses (SOC21).

Disclosures include compliance with ESG legislation and its exposure to possible future regulatory developments.

Social aspects were introduced in a much more comprehensive approach in the 2023 module. Although the social KPIs are not part of the required core set of KPIs, they do represent best practice and include general social topics such as diversity, equity and inclusion, training, stakeholder engagement, health, safety and wellbeing, but also real estate-specific social topics such as tenant satisfaction, affordable housing and amenities. The latter contains elements of impact investing perspectives in order to foster the definition of social impact for the real estate industry.

The module does not prescribe a specific methodology but does require transparency around the reporting entity's methodologies for certain disclosures.

In summary, the INREV sustainability reporting guidelines offer a framework for defining an ESG strategy and targets with topical requirements and recommendations on portfolio level. The 2023 version includes a comprehensive set of real estate specific KPIs for environmental and social factors.

4. European Public Real Estate Association (EPRA)

Key data	Description
Full name of standard	EPRA Sustainability Best Practices Recommendations (EPRA sBPR)
Category of standard	Real estate industry specific reporting standard
Type of standard	Corporate
Application	Voluntary; listed real estate companies
Stakeholder	Investors
Reporting mechanism	Integrated reporting recommended, but annual report, sustainability report or public location (e.g., company website if referenced in such reports) possible
Geographical application	Europe
Structure	EPRA sBPR published independently of EPRA BPR Guidelines for financial reporting
Purpose	To achieve greater consistency and clarity to companies' disclosure around their environmental performance, to enhance further stakeholders' access to quality environmental, social and corporate governance performance data that clearly states the positive direction of travel within the real estate sector.
Real estate specific	Yes
Source of data	Organisation, asset
Types of disclosure	Science-based metrics, governance-based
Version	September 2017
Issuing body	European Public Real Estate Association, is a non-profit association representing Europe's publicly listed property companies, based in Brussels, Belgium.
Scope of mapping	EPRA Best Practices Recommendations for Sustainability Reporting (EPRA sBPR)
Additional information	Aligned with selected GRI metrics and definitions and CRESD (Construction and Real Estate Sector Disclosures in accordance with the former G4 Guidelines) and TCFD, NFRD and CRREM
Link	https://www.epra.com/

Overview of metric mapping

	Define	Describe	Manage	Measure	Grand total
E - Climate mitigation				16	**16**
E - Climate adaption					
E - Pollution prevention				5	**5**
E - Circular economy					
E - Water				3	**3**
E - Biodiversity					
S - Health & Safety				4	**4**
S - Community impact				3	**3**
S - Employees				11	**11**
G - Governance			5	4	**9**
G - Compliance				3	**3**
G - Strategy					
G - Risk management					
G - Economic information					
G - Sustainability					
G - Environmental	1			1	**2**
G - Social					
Grand total	**1**		**5**	**50**	**56**

Standard description

The EPRA Sustainability Performance Measures contained in the EPRA BPR are divided into core measures and additional recommendations based on EPRA best practices. Most disclosures require measurable metrics to enable comparison with other enterprises.

Whilst having a strong environmental focus, the scope of measures was broadened in the face of the NFRD to include social and governance topics. In terms of lifecycle, the measures address the holding and operational usage of the buildings, not the development or construction.

Recommendations include detailed real-estate specific factors to consider when calculating measures, e.g., 'for industrial properties and retail parks where the landlord only buys electricity for the purposes of external/street lighting, companies should not use internal building area for the purposes of GHG emission intensity performance measures. Rather, they should normalize the consumption by either number of car park spaces or m2 area covering external areas (if available)' (GHG-Int).

Examples of social measures include health and safety (H&S Emp), diversity (Diversity-Emp) and pay gap, as well as community engagement (Comty-Eng). For example, 'companies must report the ratio of the basic salary and/or remuneration of female employees in the organisation's governance bodies and other significant employee categories' (Diversity-Pay).

In terms of governance, several disclosures surrounding board composition, selection, independence, conflicts of interest and ESG competence are required: 'the composition of the highest governance body by number of independent/non-executive board members with competencies relating to environmental and social topics' (Gov-Board).

Compliance measures relate to breaches of health and safety regulations, e.g., 'any incidents of non-compliance with voluntary codes concerning the health and safety impacts of assets assessed during the reporting period' (H&S Comp).

On building level, the ‘number of sustainability certification, rating or labelling schemes’ (Cert-Tot) is to be disclosed in line with the type of such schemes.

In summary, the EPRA BPR contribute real-estate specific interpretations in particular of environmental metrics and more transparency surrounding board composition, which is an important factor for understanding an enterprise’s capability of responding to sustainability risks.

Absolute and like-for-like performance measures include only landlord-obtained energy and water data, thus acknowledging the limited control of the landlord over tenant behaviour (see section 7.5 of the EPRA sBPR). However, for purposes of measuring the total impact of the building, whole building data is required by other reporting standards.

5. Sustainable Finance Disclosure Regulation (SFDR)

Key data	Description
Full name of standard	Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector (SFDR)
Category of standard	Sustainability reporting regulation
Type of standard	Corporate and fund level (ie, entity and product)
Application	Mandatory; fund managers*
Stakeholder	Investors
Reporting mechanism	Periodic report, pre-contractual disclosures, website
Geographical application	EU
Structure	Regulation (level I), regulatory technical standards (RTS, level II)† and annexes thereto (reporting templates)
Purpose	Disclosures in the financial services sector (both at entity and product level) to require transparency in the investment decision-making process and advisory processes of: the integration of sustainability risks, on the consideration of adverse sustainability impacts, on sustainable investment objectives, and on the promotion of environmental or social characteristics.
Real estate specific	Yes
Source of data	Organisation, assets
Types of disclosure	Governance-based, science-based metrics
Version	Regulation of 2019, draft regulatory technical standards of April 2022
Issuing body	European Parliament and European Council
Scope of mapping	SFDR and Annex 1 of the draft RTS (principal adverse indicators applicable to real estate assets); no inclusion of requirements for financial advisers, RTS or other adverse indicators
Additional information	Sustainability definition partially linked to EU Taxonomy
Link	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32019R2088

***** For purposes of this study, only the requirements for fund or portfolio managers (i.e. 'financial market participants') are included. Requirements for financial advisers are not considered.

† Commission Delegated Regulation (EU 2020/852) supplementing Regulation (EU) 2019/2088 of the European Parliament and of the Council with regard to regulatory technical standards specifying the details of the content and presentation of the information in relation to the principle of 'do no significant harm', specifying the content, methodologies and presentation of information in relation to sustainability indicators and adverse sustainability impacts, and the content and presentation of the information in relation to the promotion of environmental or social characteristics and sustainable investment objectives in pre-contractual documents, on websites and in periodic reports.

Overview of metric mapping

			E - Climate mitigation	E - Climate adaption	E - Pollution prevention	E - Circular economy	E - Water	E - Biodiversity	S - Health & Safety	S - Community impact	S - Employees	G - Governance	G - Compliance	G - Strategy	G - Risk management	G - Economic information	G - Sustainability	G - Environmental	G - Social	Grand total
Corporate		**Define**																		
		Describe													2					**2**
		Manage										5			3					**8**
		Measure													1					**1**
Portfolio / Fund	**Construction (transport, development, installation)**	**Define**																		
		Describe																		
		Manage																		
		Measure				1														**1**
	Operational/Usage (AM, PM, FM, leasing, repair and maintenance)	**Define**																		
		Describe																		
		Manage																		
		Measure	6			1		1												**8**
	Others	**Define**																		
		Describe											8		2					**10**
		Manage	1											1						**2**
		Measure	1										4		3					**8**
		Grand total	**8**			**2**		**1**				**5**	**12**	**1**	**11**					**40**

Standard description

The first disclosures of the SFDR were required on entity level as of March 2021 to give transparency as to whether fund managers consider sustainability risks in their investment processes. On fund level, the regulation is in effect within the EU for the financial year 2022, meaning that the first annual fund reports containing SFDR disclosures will be published by mid 2023.

The SFDR attaches the level of disclosures to the level of sustainability of the fund (e.g., a so-called Article 8 fund claiming to have environmental or social characteristics and to be investing into companies with good governance, or a so-called Article 9 fund having sustainable investments as its objective). Disclosure under Article 6 applies to all funds (on a comply-or-explain basis) and requires products to report how sustainability risks are integrated. It is important to note that the SFDR is not a labelling scheme, but a disclosure regime.

Central to the logic of the SFDR is the concept of double materiality. On the one hand side, every fund manager has to disclose the likely negative impacts of sustainability risks – environmental, social or governance events or conditions – on the returns of their funds (Art. 6 SFDR).

On the other hand side, disclosures on the defined (principal) adverse indicators, e.g., a fund manager's consolidated negative impacts on sustainability factors across assets under management, are required. Additionally, those funds with a sustainability claim have to provide substantial information on how the claims (characteristics or objectives) are met.

Thus, the fund manager can consider negative financial risks and sustainability risks as they affect the returns of their funds as well as principal adverse indicators as they impact the environment, people and the economy. Where there is a commitment tomake sustainable investments, investors will also have to provide information to demonstrate how positive sustainability characteristics or sustainable investment objectives are met by the investment strategy.

This holistic approach of the SFDR harmonizes the disclosures to give transparency as to how sustainability risks are managed by the fund manager to protect investors, works to tackle greenwashing by demanding evidence of positive alignment or impacts, and gathers standardized data per fund manager to enable comparability between fund managers.

Given the complexity of the type of disclosures, the draft regulatory technical standards ('RTS' or 'level II' detailing the SFDR requirements for pre-contractual, website, and periodic disclosures) cannot be clearly mapped to the categories defined as many include more than one aspect, e.g., governance, compliance and risk management, and general sustainability as a thematic factor. Of the over 200 RTS requirements for fund managers, a significant number are in place to provide investors with comprehensive and non-misleading information, standardized metrics, full transparency on calculation methodologies, data sources and underlying benchmarks. The Annexes II-V to the RTS provide disclosure templates for Art.8 and Art. 9 funds.

Annex I of the RTS lists the principal adverse indicators that have to be reported on consolidated fund manager level. 10 are directly applicable to real estate investments, thereof 2 are mandatory (relating to fossil fuels and energy efficiency), the rest are additional opt-in climate and environment-related indicators (GHG emissions, energy consumption, waste, resource consumption and biodiversity).

The principal adverse indicators in Annex I for social and employee, respect for human rights, anti-corruption and anti-bribery matters are not directly applicable to real estate investments, but additional indicators may always be identified by the reporting fund manager with reference to internal policies, engagement (and actions taken), international standards and historical comparisons. Further, for any investments qualifying as sustainable investments, the 'do not significantly harm' principle under the draft RTS also includes alignment with the minimum safeguards[33] of the EU taxonomy, thus requiring disclosure on 'whether the sustainable investment is aligned with the OECD Guidelines for Multinational Enterprises and the UN Guiding Principles on Business and Human Rights, including the principles and rights set out in the eight fundamental conventions identified in the Declaration of the International Labour Organisation on Fundamental Principles and Rights at Work and the International Bill of Human Rights'.

The indicators for investee companies are the most comprehensive and apply for indirect real estate investments, whether public or private. Data availability, as with other reporting standards, is a challenge especially for privately held companies and real estate assets and may lead to a fund manager's inability to consider certain factors in their investment decisions.

Thus, while the SFDR provides a framework for defining disclosures on the sustainability of the investments and

contains a legal definition for what a sustainable investment is, there is great unclarity regarding the interpretation of those definitions. Further, the principal adverse indicators determined to be applicable for real estate have a narrow focus. It can be assumed that these were based on a materiality assessment within the context of the European Green Deal and it must be remembered that the purpose is to measure the consolidated impact of fund managers on global sustainability risks, yet these would not necessarily cover all the ESG topics identified as material in an e.g., GRI or SASB based materiality matrix on corporate level.

It is important to note that the SFDR's standards for sustainability is defined by the EU Taxonomy. In summary, the SFDR presents a complex disclosure regulation that requires a thought-out ESG investment strategy and investment processes as a foundation. Involvement of legal and compliance expertise is necessary given the cross-references to investor protection regulations and other financial services regulations[34] as well as expected national supervisory authority rules and interpretations[35]. It's definition of sustainability and material indicators is driven by EU regulators and the purpose of which is to prevent greenwashing and channel capital into investments that contribute to global sustainability goals. From an industry perspective, the defined indicators present a minimum standard for investors and do not fulfil best practices (such as GRESB) in the real estate sector, thus further disclosures are required to satisfy transparency demands from experienced ESG real estate investors and stakeholders.

6. Task Force on Climate-related Financial Disclosures (TCFD)

Key data	Description
Full name of standard	Recommendations of the Task Force on Climate-related Financial Disclosures
Category of standard	Thematic reporting standard
Type of standard	Corporate and fund/portfolio level
Application	Voluntary*
Stakeholder	Investors
Reporting mechanism	Can be used in separate report or integrated into other reports, e.g., annual report
Geographical application	Global
Structure	Recommendations supported by guidance for all sectors: supplemental guidance for financial sector, supplemental guidance for non-financial groups, and appendices (in particular Appendix 1: Climate-Related Risks, Opportunities, and Financial Impacts and Appendix 2: Cross-Industry, Climate-Related Metric Categories); guidance for the scenario analysis, risk management integration and metrics and targets
Purpose	To develop climate-related disclosures that could promote more informed investment, credit (or lending), and insurance underwriting decisions and, in turn, would enable stakeholders to understand better the concentrations of carbon-related assets in the financial sector and the financial system's exposures to climate-related risks.
Real estate specific	Yes (Materials and Buildings Group)
Source of data	Organisation, tenants, building
Types of disclosure	Governance-based, science-based metrics
Version	October 2021
Issuing body	The Task Force on Climate-related Financial Disclosures, established by the Financial Stability Board (FSB) and industry-led
Scope of mapping	Annex Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures, Core recommendations only
Additional information	CRREM tool (see excursus on the tool below) can be used to perform scenario analysis for transition risk
Link	https://www.tcfdhub.org/

* TCFD may be mandatory in some jurisdictions for certain organisations.

Overview of metric mapping

	Define	Describe	Manage	Measure	Grand total
E - Climate mitigation					
E - Climate adaption					
E - Pollution prevention					
E - Circular economy					
E - Water					
E - Biodiversity					
S - Health & Safety					
S - Community impact					
S - Employees					
G - Governance			2		**2**
G - Compliance					
G - Strategy			3		**3**
G - Risk management			3	3	**6**
G - Economic information					
G - Sustainability					
G - Environmental					
G - Social					
Grand total			**8**	**3**	**11**

Standard description

The TCFD recommendations represent the key underlying framework for climate-related disclosures of many other reporting standards included in this study, which seek alignment on its principles and metrics. Their focus is on providing transparency on the financial implications of climate change and to provide 'information to support informed investment, lending, and insurance underwriting decisions and improve understanding and analysis of climate-related risks and opportunities'[36].

The TCFD recommendations are structured into four thematic areas ('pillars') that represent key 'manage' and 'measure' disclosure components described in chapter 4.3 — governance, strategy, risk management, and metrics and targets. The four areas are complemented by key climate-related financial disclosures.

Strategy disclosures for all sectors include: 'For the climate-related scenarios used, organisations should consider providing information on the following factors to allow investors and others to understand how conclusions were drawn from scenario analysis:

- Critical input parameters, assumptions, and analytical choices for the climate-related scenarios used, particularly as they relate to key areas such as policy assumptions, energy deployment pathways, technology pathways, and related timing assumptions.
- Potential qualitative or quantitative financial implications of the climate-related scenarios, if any.'

The supplemental guidance for asset managers provides examples for metrics & targets to be disclosed by the asset manager for each product or investment strategy. These include descriptions of metrics used to assess climate-related risks and opportunities, how these metrics may have changed, and how they are used in investment and risk management processes. Specifically, asset managers should disclose the measure of alignment of their strategies with a well below 2°C scenario.

Further metrics for asset managers include GHG emissions and the weighted average carbon intensity (WACI) for each product or investment strategy and other carbon footprinting and exposure metrics considered useful. Guidance for such metrics is provided.

Real estate specific guidance is included in the supplemental guidance for the Materials and Buildings Group – i.e. Construction Materials and Real Estate Management and Development industries.

These industries are determined to be typically capital intensive investments in fixed locations and dependent on sources of raw and refined materials. They have (financial) exposures to GHG emissions and high energy consumption, which is in line with the built world's emission contribution statistics. Further, water availability and resilience to physical risks may be relevant.

Therefore, additional industry-specific metrics such as building energy intensity by area, building water intensity (by occupants or square area), percent of fresh water withdrawn in regions with high or extremely high baseline water stress, and area of buildings, plants, or properties located in designated flood hazard areas are suggested.

In practice, other reporting frameworks and standards such as ISSB, CDP, SASB and GRESB have aligned with this guidance, hence it is recommended future research reviews these disclosure requirements to identify industry best practice when implementing the TCFD.

A proposal for real estate specific metrics and alignment across the European regulations and other key regulations has been submitted by various industry associations including INREV to the UK supervisory authority FCA[37].

7. Climate Bonds Initiative (CBI)

Key data	Description
Full name of standard	Climate Bonds Standard
Category of standard	Thematic reporting standard
Type of standard	Corporate (bond / debt instrument issuers)
Application	Voluntary
Stakeholder	Investors
Reporting mechanism	Certification (label); Update report
Geographical application	Global
Structure	Climate Bonds Standard, the Climate Bonds Taxonomy, Sector Eligibility Criteria, guidance material and certification documents
Purpose	The Climate Bonds Standard and Certification Scheme is a labelling scheme for bonds, loans & other debt instruments. Rigorous scientific criteria ensure that it is consistent with the goals of the Paris Climate Agreement to limit warming to 1.5 degrees. The Scheme is used globally by bond issuers, governments, investors and the financial markets to prioritise investments which genuinely contribute to addressing climate change.
Real estate specific	Yes (Buildings)
Source of data	Organisation, building
Types of disclosure	Science-based
Version	Version 3.0 (December 2019)
Issuing body	Climate Bond Initiative Board
Scope of mapping	The Buildings Criteria for the Climate Bonds Standard & Certification Scheme (July 2020)
Additional information	Aligned with the Green Bond Principles and the Green Loan Principles. Advised on EU Taxonomy.
Link	https://www.climatebonds.net/

Overview of metric mapping

	Define	Describe	Manage	Measure	Grand total
E - Climate mitigation		5	3	5	**13**
E - Climate adaption					
E - Pollution prevention					
E - Circular economy					
E - Water					
E - Biodiversity					
S - Health & Safety					
S - Community impact					
S - Employees					
G - Governance					
G - Compliance					
G - Strategy					
G - Risk management					
G - Economic information					
G - Sustainability					
G - Environmental					
G - Social					
Grand total		**5**	**3**	**5**	**13**

Standard description

The Climate Bonds Initiative works globally to mobilize capital for climate action – as green bonds, green loan or green debt instruments. Sector eligibility criteria are defined to determine which projects and assets qualify for certification. The criteria are science-based and designed to achieve the targets of the Paris Climate Agreement. Currently, only climate mitigation components are eligible. The CBI has issued Climate Resilience Principles to address climate adaptation and resilience as a framework. These principles will be further developed into sector-specific criteria.

For the Building sector, eligible assets include residential (single and multi-family, rentals), commercial (offices, schools and campuses, shopping centers and retail) and industrial (manufacturing, agriculture/livestock, energy generation facilities) assets. These assets are eligible on the condition of fulfilling the screening criteria, whereby the use of proceeds for infrastructure not eligible for certification.

The use of proceeds options include financing (origination or refinancing), capital costs for performance upgrades (e.g., smart metering, equipment or retrofits) and operating expenses for maintenance (to increase energy efficiency and decrease carbon emissions).

In order to achieve net zero by 2050, the initial baseline for the certification is the emissions intensity benchmarked against the top 15 percent of the buildings in the defined location, with performance targets[38] declining to zero over time. The two pathways (absolute performance and relative performance improvement) can be achieved via three conditions – the trajectory method (quantitative), proxy method (qualitative) and upgrade method (retrofits).

After certification, post-issuance reporting[39] is required on an annual basis to maintain the certification. The disclosures are linked to the conditions and seek to demonstrate how the scientific targets are achieved.

The allocation reporting mainly confirms that the bond proceeds have been allocated to eligible projects and

assets, i.e. that they are aligned with the Climate Bonds Standard. This may include statements of alignment with other applicable standards, such as the proposed EU Green Bond Standard, the ASEAN Green Bond Standard, Chinese domestic regulations, Japanese Green Bond Guidelines, etc. Further information on the allocation and climate-related board objectives are to be provided.

The eligibility reporting demonstrates that the characteristics and performance of the projects or assets fulfil the sector eligibility criteria.

The impact reporting, which is not mandatory, should provide the expected or actual outcomes with respect to the climate-related objectives of the bond, using qualitative and quantitative performance measures as well as disclosing the methodology.

Given that the Carbon Bonds Standard is aligned with the Paris Agreement, alignment with European regulations (EU Taxonomy, SFDR) is to be expected. Impact reporting should be treated as mandatory to enable data collection by investors subject to regulations or with own reporting requirements.

8. Principles for Responsible Investment (PRI)

Key data	Description
Full name of standard	Principles for Responsible Investment
Category of standard	Principle-based
Type of standard	Investment Management - Organisational and asset class level
Application	Voluntary (Commitment)
Stakeholder	Investors
Reporting mechanism	Public Transparency Report; private Transparency report; private Assessment Report
Geographical application	Global
Structure	Modular (Organisational Overview; Policy, Governance & Strategy (formerly Investment and Stewardship Policy); Manager Selection, Appointment and Monitoring; Sustainability Outcomes; Real Estate; other asset classes)
Purpose	The six Principles for Responsible Investment offer a set of actions for incorporating ESG issues into investment practice. The Principles were developed by investors, for investors. In implementing them, signatories contribute to developing a more sustainable global financial system. The main goal of the Reporting Framework is to be another tool for the PRI to drive positive change in the finance industry, in line with our mission of creating a more sustainable financial system that benefits society and the environment as a whole.
Real estate specific	Yes. A specific real estate module is one part of a broader disclosure framework.
Source of data	Organisation
Types of disclosure	Governance-based, other metrics optional for Sustainability Outcomes
Version	January 2021 (metric mapping); January 2023 (standard description)
Issuing body	PRI Association
Scope of mapping	Organisational Overview; Policy, Governance & Strategy (formerly Investment and Stewardship Policy); Selection, Appointment and Monitoring; Sustainability Outcomes; Real Estate (January 2021 version)
Additional information	The PRI is an investor initiative in partnership with UNEP Finance Initiative and UN Global Compact.
Link	https://www.unpri.org/

Overview of metric mapping

			E - Climate mitigation	E - Climate adaption	E - Pollution prevention	E - Circular economy	E - Water	E - Biodiversity	S - Health & Safety	S - Community impact	S - Employees	G - Governance	G - Compliance	G - Strategy	G - Risk management	G - Economic information	G - Sustainability	G - Environmental	G - Social	Grand total
ISP		Define																		
		Describe										34	4	3						**41**
		Manage									14	51			3			2		**70**
		Measure										6		18	68			41		**133**
OO	Construction (transport, development, installation)	Define																		
		Describe										139	1	3						**143**
		Manage																		
		Measure																		
RE	Acqusition	Define																		
		Describe										10								**10**
		Manage										11								**11**
		Measure										1								1
	Construction (transport, development, installation)	Define																		
		Describe																		
		Manage																		
		Measure															1	8		9
	Exit - Sale	Define																		
		Describe																		
		Manage										7								**7**
		Measure																		
	Operational/ Usage (AM, PM, FM, leasing, repair and maintenance)	Define																		
		Describe																		
		Manage										28	7							**35**
		Measure																6		6
	Others	Define																		
		Describe																		
		Manage										4	1	1	4					**10**
		Measure										1								1
SAM		Define																		
		Describe										1	43							**44**
		Manage										234	261							**495**
		Measure										55								55
SO		Define																		
		Describe												1						**1**
		Manage										17		8		1				**26**
		Measure												5						5
		Grand total									**14**	**599**	**317**	**39**	**75**	**1**	**1**	**57**		**1103**

Standard description

The purpose of the PRI is to contribute to developing a more sustainable global financial system by fostering the fiduciary responsibility of asset and fund managers as well as asset owners (e.g., pension funds, sovereign wealth funds, foundations, endowments, and insurers) to manage ESG impacts on the performance of investment portfolios. It aims to understand the investment implications of environmental, social and governance (ESG) factors and to support its international network of investor signatories in incorporating these factors into their investment and ownership decisions.

The Principles for Responsible Investment consist of 6 principles – phrased as commitments by the PRI signatories. They are accompanied by possible actions on incorporating ESG issues into investment and governance processes, stewardship and engagement, transparency, compliance with and advocacy of the Principles.

The PRI signatories have to report annually on their responsible investment activities to the PRI. The reporting is linked to the 6 Principles and feeds into the PRI Assessment. Signatory groups receive private Assessment Reports, which are designed to provide feedback on peer level across asset classes, to educate and to encourage development on investors' responsible investment practices. The Assessment Reports also allow asset owners to engage with investment managers and improve their practices. Further, public and private Transparency Reports are issued.

The modules underlying the reporting cover both organisational and asset-class specific responsible investment practices. Reference is made to further underlying alternative asset classes in the organisational statistics. The modules included in the mapping are Organisational Overview (OO), Manager Selection, Appointment and Monitoring (SAM), Investment and Stewardship Policy (ISP), Sustainability Outcomes (SO) and Real Estate (RE).

These modules underwent major changes for the 2023 Reporting Framework, in particular the former ISP (now Policy, Governance and Strategy) and SAM modules. The changes, however, were mainly structural rather than content-related, to improve consistency and reduce some of the reporting effort. Some references to the net zero initiatives were included. A mapping resource document 'Indicator changes guide' is available the PRI website.

The PRI disclosures generally do not require provision of the results of any metrics or targets, neither do they demonstrate a direct link to financial information. Rather, the disclosures require in-depth information into the 'what' and 'how' ESG is integrated into fund and asset management practices, thereby collecting extensive standardized data on ESG governance ('manage'). The Sustainability Outcomes module, however, which is voluntary, does focus on measuring targets and outcomes. These are not prescribed by the PRI but defined by the signatory's individual ESG strategy.

Given the extensive scope of metrics, some further guidance* on the mapping approach is included in a footnote. This scope is necessary as it sheds light on different ESG approaches for different asset classes – hence the metrics require, where suitable, a response per asset class to reflect the complexity of ESG incorporation.

Transparency on the level of ESG incorporation per asset class, per management and holding type for internally managed real estate and infrastructure is included in the OO module. In OO 24, strategies for direct physical real estate assets are divided into standing investments, new construction and major renovation. This information is followed by level of ownership (OO 25) to assess possible scope of influence and types of asset management (OO 26) to assess direct operational control.

The responsible investment policy, governance, stewardship, and other ESG issues such as climate change are the core focus of the PGS (formerly ISP) module.

***** The OO module responses are not assessed and contain comprehensive data requests on assets under management (in percent) per asset class, per strategy, per type of management (internally/externally), and further criteria. Data of this type is classed as 'statistics' in the mapping overview and is in place to inform about the exact business operations and to enable peer comparisons. The scope of the required data across so many combinations of criteria and multiple-choice responses results in the very high number of metrics counted in this mapping.

Further, 'measure' was used to class metrics that require information on what types of KPIs are used to measure – this is a slight deviation from the methodology in this study where 'measure' is used to demonstrate where actual results of measurement have to be disclosed. Further, questions requiring general information, having multiple choice options or requiring a 'yes' or 'no' are generally classed as 'describe' as their purpose it to inform. Depending on the context, questions with drop-downs/multiple choice may have been mapped to other purposes if the information value had a strong link to e.g., 'measure' or 'manage'.

The statistical and multiple-choice questions are largely classed as 'Governance' KPIs if they are not classed as 'Strategy' KPIs. Stewardship and engagement topics are also largely classed as Governance. The KPI 'Compliance' is used where metrics require information on how adherence with internal standards or contracts, rather than external requirements, is ensured. It also includes metrics relating to the marketing and labelling of products and/or funds as ESG and/or sustainable.

This includes disclosures of the elements covered in the responsible investment policy (e.g., PGS 1, PGS 2) and which internal roles have formal oversight over and are accountable for them (PGS 11.1) as well as indicating whether the responsible investment KPIs used to evaluate these roles are linked to compensation (PGS 14). Equally, investors can disclose the primary stewardship objectives per asset class (PGS 22), prioritisation of the investees or other entities on which to focus stewardship efforts(PGS 23) and ranking of methods to achieve the stewardship objectives (PGS 25). The PGS module further includes specialized sections on two priority issues: climate change (PGS 41 – PGS 46)), and human rights (PGS 49 – PGS 50). The former is aligned with TCFD recommendations and aims to understand strategies, scenarios and metrics on climate change, including an Inevitable Policy Response (PGS 43). In the latter signatories can disclose how investment-related negative outcomes for people are identified and managed (PGS 49), including access to remedy (PGS 50). General sustainability outcomes ('The positive and negative effects of investment activities on people and/or the planet. They are understood in the context of global sustainability goals and thresholds', as part of the collective impact of the financial system towards the UN Sustainable Development Goals†), are covered in PGS 47 – PGS 48.1.

Lastly, the CBM (Confidence-Building Measures) module includes transparency and confidence-building topics such as scope, content and regularity reporting and level of third party assurance therefore.

The SAM module contains comprehensive disclosures on manager selection, appointment and monitoring, thus creating transparency on the internal criteria for and level of external management. It is mandatory for signatories to report in SAM on every asset class that makes up 10%+ or over US$10bn of their total AUM, managed by external investment managers. For clarity, external management in the SAM module is in reference to investment managers and not property managers.

The RE module is structured along the lifecycle of real estate investment and includes the selection, appointment and monitoring process of third-party property managers. In the acquisition phase, the basis for the ESG materiality analysis is required to be disclosed – with GRI, SASB, TCFD as some of the key options. The influence of ESG factors on asset selection criteria are covered in RE 4.

Sustainability requirements and minimum construction requirements for developments and renovations are disclosed under RE 9 and 10, the latter listing building certifications as one option – with a follow-up disclosure on the proportion of assets covered by building certifications (RE 17). The process for the definition, implementation and monitoring of ESG actions plans can be described voluntarily as a narrative opportunity (RE 16), thus providing the governance framework surrounding the actual action plans to be disclosed under the INREV Guidelines. During the operational usage phase, ESG metrics for monitoring must be specified under RE 12. This is linked to methods for tenant engagement (RE 18).

The voluntary Sustainability Outcomes module builds upon up to 10 specific sustainability outcomes defined by each signatory. After examining how targets and metrics for measuring those outcomes are defined and tracked, the methods for taking action on sustainability outcomes, including the disclosure of the overall budget (SO 6 & SO 4) allocated to asset allocation, investee engagement and systemic stewardship, including policy engagement. This includes collaboration with various stakeholders, investees and investment managers.

In summary, the PRI disclosures provide a deeper understanding of how ESG is governed and managed at both organisational and asset-class level. The RE module reflects the key considerations through real estate specific governance metrics, which can be complemented by more detailed science-based and implementation-based metrics from other standards. The real estate lifecycle is also considered.

The mandatory reporting modules do not measure impact, but measure progress on how ESG is embedded into internal processes. These modules are complemented by the Sustainability Outcomes module, which is designed to provide transparency on strategy and targets and how those are achieved.

† PRI Association (2020) and PRI Association (2017).

9. Climate Disclosure Standards Board (CDSB)

Key data	Description
Full name of standard	CDSB Framework for reporting environmental and social information
Category of standard	Thematic reporting standard
Type of standard	Corporate
Application	Voluntary
Stakeholder	Investors
Reporting mechanism	Can be used in separate report or integrated into other reports, e.g., annual report
Geographical application	Global
Structure	The framework consists of 7 guiding principles and 12 reporting requirements including guidance.
Purpose	Advancing and aligning disclosure of environmental and social information in mainstream reports for reporting environmental & social information
Real estate specific	No
Source of data	Organisation
Types of disclosure	Governance-based
Version	January 2022
Issuing body	CDSB Secretariat
Scope of mapping	CDSB Framework for reporting environmental and social information
Additional information	On 31st January 2022, the CDSB was consolidated into the IFRS Foundation to support the work of the newly established International Sustainability Standards Board. CDSB technical guidance will form part of the evidence base as the IFRS S1/S2 develops its IFRS Sustainability Disclosure Standards. CDSB's Framework and technical guidance on Water, Biodiversity, and Social disclosures will remain useful as a resource for prepares to consider when they identify disclosures not covered by the ISSB standards (under IFRS S1 exposure draft).
Link	https://www.cdsb.net/

Overview of metric mapping[40]

	Define	Describe	Manage	Measure	Grand total
E - Climate mitigation					
E - Climate adaption					
E - Pollution prevention					
E - Circular economy					
E - Water					
E - Biodiversity					
S - Health & Safety					
S - Community impact					
S - Employees					
G - Governance			1		**1**
G - Compliance		4	2		**6**
G - Strategy			2		**2**
G - Risk management			2	1	**3**
G - Economic information					
G - Sustainability					
G - Environmental					
G - Social					
Grand total		**4**	**7**	**1**	**12**

Standard description

The Climate Disclosure Standards Board (CDSB) was hosted by the Carbon Disclosure Project (CDP) and consists of an international consortium of business and environmental NGOs. It has now been consolidated with the ISSB.

Despite its title, the CDSB framework also has a strong social and human rights focus and supply chain considerations. As a framework, the CDSB uses extensive references to other thematic standards and initiatives for identifying appropriate measures, indicators and further disclosures (REQ-4) and is designed to be complementary to annual financial reports containing supporting information on the business model, supply chain, key roles and functions, staffing, locations of operation, etc. Prerequisite is a materiality assessment performed by the reporting organisation (Principle 1), whereby GHG emissions shall be treated as material and reported in all cases.

The environmental and social information addresses (natural, human, and social) capital dependencies, results, risks and opportunities, policies, strategies and targets as well as performance against those targets.

Environmental impacts 'are changes in the condition of the environment. Impacts may include (but are not limited to) climate change, deforestation and ecosystem conversion, pollution, loss of biodiversity and ecosystem services, changes to water availability and land use'. Social impacts are 'limits on or changes to the ability of people to realize their human rights, as defined by international standards, where these limits or changes are connected to an organisation's operations, products, and/or services'. Social impacts can be relevant for the organisation's workforce or the workforce of upstream/downstream entities, community members and consumers. Examples include disclosing appropriate quantitative and qualitative information that demonstrates the organisation's contribution to social inequalities or the impacts of its products on different social groups.

The 12 reporting requirements are accompanied by a purpose statement and in-depth guidance on what disclosures are expected.

Of these, 6 reporting requirements are content-related and 6 establish formal requirements (REQ-07 organisational boundary, REQ-08 reporting policies, REQ-09 reporting period, REQ-10 restatements, REQ-11 conformance, and REQ-12 assurance).

The content-related reporting requirements focus on the governance set-up (REQ-01), strategies, policies and targets (REQ-02), the business risks and opportunities identified (REQ-03), accompanied by the sources of impact (REQ-04) and a comparative analysis of change drivers and year-on-year performance (REQ-05). As a final requirement, an outlook based on the previous disclosures is required from management.

One of the requirements of REQ-02 focusses on the resourcing of the set strategies, i.e. with what resources the targets will be managed delivered, including investment and capital expenditure. Further, transparency as to what degree these resources are integrated into the organisation and business processes is required. Beyond offering guidelines on indicators, timelines and targets, REQ-02 also examines dependencies on and between the natural, social and human capital, i.e. the individuals, relationships and networks the organisation depends on for the provision of goods and services to fulfil the business strategy, as well as positive and negative co-dependencies between environmental and social issues (e.g., improving health and safety of the workforce by using less polluting materials, or damaging the livelihood and culture of indigenous communities by destroying forests and biodiversity).

REQ-3 provides guidance on identifying direct or indirect environmental and social risks and opportunities. Table 1 breaks down potential risks and opportunities resulting from regulatory requirements, physical, operational, and business continuity considerations as well as reputational or social license considerations. The organisation must also explain how and to which extent the organisation can maximize opportunities and mitigate risks, directly or indirectly e.g., through customers, supply chain and markets.

Beyond the year-on-year performance comparison, REQ-05 requires an analysis to significant changes in performance, impacts or results based on either internal factors (governance-based, changes in operations and business activities) or external factors (e.g., from a social perspective, the vulnerability of individuals impacted by the organisation or economic and political developments).

In summary, the CDSB provides a very useful framework and source of references for global thematic standards and initiatives whilst prescribing some definite and important governance requirements. Especially social and human rights as well as supply chain considerations are more deeply reflected than in other reporting standards, as are the complexities of co-dependencies between environmental and social issues. The CDSB also goes into more detail regarding the resources and types of capital – beyond financial capital – utilised to achieve the ESG targets.

Whilst not prescribing the exact metrics to be measured – the CDSB leaves this to the discretion of the reporting organisation based on its materiality assessment and other standards – it does demand an analysis per business and geographical segment. For the real estate sector, the wide-ranging implications of some environmental and social implications may not be fully applicable, however, for global portfolios, the general approach is recommended. The framework is referenced as a resource for prepares under IFRS S1 exposure draft.

10. EU Taxonomy

Key data	Description
Full name of standard	REGULATION (EU) 2020/852 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088
Category of standard	Sustainability regulation
Type of standard	Corporate and fund/portfolio level
Application	Mandatory
Stakeholder	Investors
Reporting mechanism	Financial statements and filings
Geographical application	EU
Structure	EU Taxonomy regulation currently including: • Commission delegated regulation ('Level II') on the reporting requirements under Article 8 (see Scope of Mapping), • Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives • Commission Delegated Regulation (EU) 2022/1214 of 9 March 2022 amending Delegated Regulation (EU) 2021/2139 as regards economic activities in certain energy sectors and Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities ('Complementary Climate Delegated Act') • Draft Report on Minimum Safeguards JULY 2022 (Platform on Sustainable Finance)
Purpose	To channel capital flows towards sustainable investments by creating common definitions (classification system), increasing transparency and preventing greenwashing.
Real estate specific	Yes (technical screening criteria)
Source of data	Organisation
Types of disclosure	Financial
Version	June 2020
Issuing body	European Parliament and European Council
Scope of mapping	Annex I and II (KPIs of non-financial undertakings and asset managers) of COMMISSION DELEGATED REGULATION (EU) 2021/2178 of 6 July 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by specifying the content and presentation of information to be disclosed by undertakings subject to Articles 19a or 29a of Directive 2013/34/EU concerning environmentally sustainable economic activities, and specifying the methodology to comply with that disclosure obligation
Additional information	The SFDR references the EU Taxonomy for sustainability definitions.
Link	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32020R0852

Overview of metric mapping

		Define	Describe	Manage	Measure	Grand total
E - Climate mitigation						
E - Climate adaption						
E - Pollution prevention						
E - Circular economy						
E - Water						
E - Biodiversity						
S - Health & Safety						
S - Community impact						
S - Employees						
G - Governance						
G - Compliance						
G - Strategy						
G - Risk management						
G - Economic information						
	Asset managers				17	**17**
	Non-financial undertakings				12	**12**
G - Sustainability						
G - Environmental						
G - Social						
Grand total					**29**	**29**

Standard description

The EU Taxonomy regulation, as part of the implementation measures of the European Green Deal, represents a classification system within the EU that defines which economic activities substantially contibute to environmental objectives, using science-based criteria (i.e. in order to qualify as sustainable). As with the SFDR, the purpose is to channel capital flows towards sustainable investments by creating common definitions, increasing transparency and tackling greenwashing. First qualitative disclosures have to be made for 2022, with the remaining provisions mainly entering into force in 2023 and 2024.

The EU Taxonomy covers six environmental objectives: climate change mitigation, climate change adaptation, the sustainable use and protection of water and marine resources, the transition to a circular economy, pollution prevention and control, and the protection and restoration of biodiversity and ecosystems. Science-based technical screening criteria are defined (currently only for climate change mitigation and adaptation) per economic activity to determine what qualifies as a substantial contribution to an objective.

Only taxonomy-aligned economic activities, which substantially contribute to an environmental objective, do not significantly harm other objectives, fulfil minimum social safeguards and the technical screening criteria qualify as sustainable. Further transitional economic activities are recognised as making a substantial contribution to the climate mitigation objective, as are directly enabling activities for economic activities substantially contributing to any environmental objective. Taxonomy-eligible economic activities may contribute to the environmental objectives, but do not fulfil the technical screening criteria. Taxonomy-non-eligible economic activities are all other economic activities.

The definitions contained in the EU Taxonomy are included in the scope of the 'sustainable investment' definition of the SFDR).

The disclosure obligations in Article 8 of the EU Taxonomy are also aligned with the SFDR to provide, inter alia, supplementary information to the sustainability-related disclosures of the SFDR. The delegated regulation ('level II') for Article 8 includes definitions and reporting templates. For this study, annex 1 (for non-financial undertakings) and 3 (for asset managers) were included in the mapping.

Non-financial undertakings have to disclose how and to what extent their activities are associated with environmentally sustainable economic activities. For this, three key performance indicators are defined:

- the proportion of their turnover derived from products or services associated with economic activities that qualify as environmentally sustainable,
- the proportion of their capital expenditure ('capex'), and
- the proportion of their operating expenditure (opex') related to assets or processes associated with economic activities that qualify as environmentally sustainable

The three KPIs are accompanied by further disclosures on the accounting policies, qualitative information on compliance with the EU Taxonomy and screening criteria, methodology as well as contextual information to explain the financial figures disclosed. Further, the KPIs have to be allocated to the six environmental objectives, also differentiating between taxonomy-aligned, taxonomy-eligible and taxonomy-non-eligible.

For financial undertakings, these KPIs are not suitable for assessing the environmental sustainability of e.g., lending, investment and insurance activities. Therefore, the level II requirements define relevant KPIs for financial undertakings. For asset managers, the proportion of investments in environmentally sustainable economic activities – from both collective and individual portfolio management activities – is to be disclosed. The numerator has to be broken down into absolute and relative amounts, turnover-based or capex-based amounts, and per environmental objective, including a proportional breakdown into transitional and enabling activities. The assets under management included in the calculations also require a breakdown (e.g., financial and non-financial investee undertakings). As a side note, for credit institutions, the key performance indicator is the green asset ratio, which discloses the proportion of exposure to taxonomy-aligned activities in comparison to the total loan assets of the institution.

The technical screening criteria (for climate change mitigation and climate change adaptation[41]) are based on industry NACE[42] codes. The sectors included in the EU Taxonomy are the ones identified as critical for achieving the EU's 2030 and 2050 climate goals and thus represent the majority of emissions[43].

The technical screening criteria for the construction and real estate industry are allocated to the following economic activities:

- Construction of new buildings
- Renovation of existing buildings
- Installation, maintenance and repair of energy efficiency equipment
- Installation, maintenance and repair of charging stations for electric vehicles in buildings (and parking spaces attached to buildings)
- Installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings
- Installation, maintenance and repair of renewable energy technologies
- Acquisition and ownership of buildings

The technical screening criteria and requirements of delegated regulations are consolidated in the EU Taxonomy Compass[44]. Each activity has detailed substantial contribution criteria, e.g., the criteria that must be met in order to classify the activity as sustainable. These criteria are complex, comprehensive, reference numerous EU standards and are partially open to interpretation[45], so some legal unclarity and national differences still exist. As a minor excerpt of the EU Taxonomy Compass, criteria for the construction of new buildings include requirements on the Primary Energy Demand (PED):

- The calculated amount of energy needed to meet the energy demand associated with the typical uses of a building expressed by a numeric indicator of total primary energy use in kWh/m2 per year and based on the relevant national calculation methodology and as displayed on the Energy Performance Certificate (EPC). Defining the energy performance of the building resulting from the construction, is at least 10% lower than the threshold set for the nearly zero-energy building (NZEB) requirements in

national measures implementing Directive 2010/31/EU of the European Parliament and of the Council Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings. The energy performance is certified using an as built Energy Performance Certificate (EPC).

- For buildings larger than 5000 m2: For residential buildings, the testing is made for a representative set of dwelling/apartment types. Upon completion, the building resulting from the construction undergoes testing for air-tightness and thermal integrity. The testing is carried out in accordance with EN13187 (Thermal Performance of Buildings - Qualitative Detection of Thermal Irregularities in Building Envelopes - Infrared Method) and EN 13829 (Thermal performance of buildings. Determination of air permeability of buildings. Fan pressurisation method) or equivalent standards accepted by the respective building control body where the building is located. Any deviation in the levels of performance set at the design stage or defects in the building envelope are disclosed to investors and clients.

The EU Taxonomy Compass will be regularly updated to include future delegated acts specifying technical screening criteria for additional economic activities substantially contributing to the climate objectives and the other environmental objectives. The screening criteria are accompanied by the do not significantly harm ('DNSH') criteria for the other environmental objectives.

The EU Taxonomy is a 'regulation in progress', as the remaining four environmental objectives will be addressed after the most urgent climate change objectives and technical screening criteria may evolve to (even) higher standards over time to meet the EU goals. At a first glance, the financial disclosures or assets under management disclosures may appear simple but putting processes in place to implement and measure whether activities meet the technical screening criteria and then technically flagging financial information (turnover, capex, opex) associated with those aligned or eligible activities in accounting systems may have an operational impact similar to implementing a new IFRS standard, in particular for consolidation purposes. It may be expected that management practices will change to align with the new presentation of financial information in financial reporting, i.e. changing business, investing and financing strategies.

Whether or not the real estate screening criteria are an incentive or deterrent for adapting the built world to reduce emissions, e.g., as some refurbishments may not meet the screening criteria and may not be invested into or financed as they do not qualify as sustainable, will be seen over time. Potentially the disclosure of taxonomy-eligible activities, which demonstrate investment into decarbonization even if they do not meet the strict criteria, can be a sufficient basis for investors and lenders when supplemented by distinct decarbonization strategies supported by the CRREM tool.

11. IFRS Sustainability Disclosure Standards Exposure Draft (IFRS S1/S2 ED)

Key data	Description
Full name of standard	IFRS Sustainability Disclosure Standards
Category of standard	Core corporate standard
Type of standard	Corporate
Application	Mandatory (depending on jurisdiction)
Stakeholder	Investors
Reporting mechanism	To be included in company's management commentary
Geographical application	Global
Structure	IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information, IFRS S2 Climate-related Disclosures, which includesAppendix B on Industry-based disclosure requirements; Illustrative Guidance and Basis for Conclusions
Purpose	The objective is to disclose information about the significant sustainability-related risks and opportunities of an enterprise that is useful to the primary users of general purpose financial reporting when they assess enterprise value and decide whether to provide resources to the entity.
Real estate specific	Yes
Source of data	Organisation
Types of disclosure	Governance-based
Version	Exposure Drafts, March 2022
Issuing body	International Sustainability Standards Board (part of IFRS Foundation)
Scope of mapping	Exposure draft of IFRS S1 and S2, Appendix B Volume B35—Home Builders, Volume B36—Real Estate, Volume B37—Real Estate Services. Note the number of metrics mapped are largely driven by the industry-based metrics. This does not account for any changes that have been announced by the ISSB ahead of finalising the standard at the end of Q2 2023.
Additional information	Alignment with 2018 GRESB® Real Estate Assessment Reference Guide for some definitions. The exposure drafts refer to additional resources that companies can refer to identify disclosure not covered by the ISSB standards (including the SASB and CDSB standards);
Link	https://www.ifrs.org/projects/work-plan/general-sustainability-related-disclosures/

Overview of metric mapping

	Define	Describe	Manage	Measure	Grand total
E - Climate mitigation	16		4	34	**54**
E - Climate adaption	2		1	8	**11**
E - Pollution prevention					
E - Circular economy					
E - Water	18		3	23	**44**
E - Biodiversity					
S - Health & Safety					
S - Community impact					
S - Employees					
G - Governance			20		**20**
G - Compliance					
G - Strategy			16	10	**26**
G - Risk management			22	27	**49**
G - Economic information	4			15	**19**
G - Sustainability				3	**3**
G - Environmental	25		2		**27**
G - Social					
Grand total	**65**		**68**	**120**	**253**

Note: It is important to highlight that there are 'E - Water' metrics even though there is no ISSB standards on water. This is based on water metrics number under Appendix B of IFRS S2 ED, based on the SASB industry-based requirements.

Standard description

Both the IFRS S1 and S2 Exposure Drafts ('ED') follow the structure of the TCFD framework – using governance, strategy, risk management and metrics/targets requirements. The exposure drafts include industry-specific metrics, provided by the SASB standards, which have only been amended to reflect more international standards where necessary and have not fully been amended to reflec the specific sustainability issue (i.e. climate).

The role of the expected disclosures are to connect sustainability-related financial information and financial information, to assess the connection between sustainability risks and opportunities, and to provide comprehensive analysis for the user of the reporting to understand the link between these risks and opportunities and financial impacts (see Connected information, IFRS S1 ED 42 et seqq.). While the TCFD framework is also designed to provide (climate-related) information to investors for financial decision-making purposes, the IFRS Sustainability Standards builds on these disclosure requirements with a broader frame of sustainability issues and additional requirements for climate.

In the following some examples from the IFRS S1 ED are provided to demonstrate the connectivity of the sustainability disclosures, beginning with a required 'description of significant sustainability-related risks and opportunities and the time horizon over which each could reasonably be expected to affect its business model, strategy and cash flows, its access to finance and its cost of capital, over the short, medium or long term' (S1 ED 16).

With a nod to double materiality, an entity has to consider adverse impacts, e.g., 'when an entity's activities result in adverse, external impacts—on, for example, local communities—it could be subjected to stricter government regulation and consequences of reputational effects—

for example, negative effects on the entity's brand and higher recruitment costs. Furthermore, when an entity's business partners face significant sustainability-related risks and opportunities, the entity could be exposed to related consequences of its own. When such impacts, dependencies and relationships create risks or opportunities for an entity, they can affect the entity's performance or prospects, create or erode the value of the enterprise and the financial returns to providers of financial capital, and the assessment of enterprise value by the primary user' (IFRS S1 ED 17).

In line with these requirements to disclose about dependencies and relationships, value chain considerations are included in IFRS S1 ED 20a and 40. One topic requiring more explicit exposure than other standards is that of trade-offs in decision-making, e.g., 'what trade-offs between sustainability-related risks and opportunities were considered by the entity (for example, in a decision on the location of new operations, a trade-off between the environmental impacts of those operations and the employment opportunities they would create in a community, and the related effects on enterprise value' (IFRS S1 ED 21c). Although the exposure draft does not go as far as to explain how companies can (or should) undertake this type of assessment.

Significant from a real estate perspective, the valuation of assets and risk of stranded assets is noted as an area that requires reporting in IFRS S1 ED 22b.

The S1 ED makes broad use of references to other standards (IFRS S1 ED 53) for identifying appropriate complementary industry-specific and thematic metrics. The IFRS S2 ED is closely aligned with the structure and content of S1 ED, but with a climate-related focus and examples. Examples from S2 ED 21 include information on greenhouse gas emissions, e.g., 'absolute gross greenhouse gas emissions generated during the reporting period, measured in accordance with the Greenhouse Gas Protocol Corporate Standard, expressed as metric tonnes of CO2 equivalent, classified as Scope 1, 2, and 3, and including greenhouse gas emissions intensity for each scope. The IFRS S2 ED introduces the disclosure of internal carbon prices, i.e. 'the price for each metric tonne of greenhouse gas emissions that the entity uses to assess the costs of its emissions; and an explanation of how the entity is applying the carbon price in decision-making (for example, investment decisions, transfer pricing and scenario analysis)' (IFRS S2 ED 21f).

Industry-specific metrics are based on the SASB standards, though they currently are only selected for the climate-related disclosures under IFRS S2 ED. They are accompanied by 'activity metrics', which are designed to 'quantify the scale of specific activities or operations by an entity and are intended for use in conjunction with metrics to normalise data and facilitate comparison' (IFRS S2 ED B4e), although they are currently only referenced in the metric overviews and not provided with guidance.

In terms of outlook, the ISSB met in October 2022[46] as part of their due process to decide on various topics for redeliberation, including the definition of 'enterprise value' and how it should be incorporated into the objective of the sustainability disclosures, how it may restrict the scope of information provided and how it stands in conflict with the objective of 'providing resources to the entity' stipulated by the financial reporting standards. The application of materiality, the use of the word 'significant' in relation to sustainability risks and the meaning of 'global baseline' to be disclosed are also to be redeliberated. The ISSB board continues to meet and working to finalise the standard, with the intention to publish the final IFRS S1 and S2 by the end of Q2 2023. Once the final standards are published, they must then be adopted by each jurisdiction before they become mandatory for corporate reporting.

In summary, although the IFRS Sustainability Standards closely follow the TCFD framework, their integration into the famously complex and demanding IFRS financial reporting framework will require appliers and primary users to broaden their understanding of the connectivity between financial and sustainability-related information and to deepen the level of financial analysis to be disclosed (in sustainability reporting).

12. Corporate Sustainability Reporting Directive (CSRD)

Key data	Description
Full name of standard	Corporate Sustainability Reporting Directive
Category of standard	Sustainability regulation
Type of standard	Corporate
Application	Mandatory
Stakeholder	Investors, civil society and other stakeholders
Reporting mechanism	Can be used in separate report or integrated into other reports (e.g., annual reports)
Geographical application	EU
Structure	Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups Text with EEA relevance Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 2013/34/EU, Directive 2004/109/EC, Directive 2006/43/EC and Regulation (EU) No 537/2014, as regards corporate sustainability reporting
Purpose	Introduces more detailed reporting requirements and ensures that large companies are required to report on sustainability issues such as environmental rights, social rights, human rights and governance factors. The CSRD also introduces a certification requirement for sustainability reporting as well as improved accessibility of information, by requiring its publication in a dedicated section of company management reports
Real estate specific	No
Source of data	Organisation
Types of disclosure	Financial metrics, Governance indicators, Science-based ESG metrics
Version	(Draft) April 2021
Issuing body	European Parliament and European Council
Scope of mapping	Mapping is only of the draft regulations. Article 1 Amendments to Directive 2013/34/EU& Article 2 Amendments to Directive 2004/109/EC AND Article 3 Amendments to Directive 2006/43/EC The mapping does not include the draft ESRS disclosure requirements.
Additional information	The CSRD has now been finalised and published within the official EU Journal, as below: 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 In addition, the European Sustainable Reporting Standards (ESRS) will further specify reporting requirements under the CSRD; the most recent draft Set 1 standards were published in November 2022 and the European Commission will adopt these as delegated acts in June 2023
Link	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0189

Overview of metric mapping

	Define	Describe	Manage	Measure	Grand total
E - Climate mitigation					
E - Climate adaption					
E - Pollution prevention					
E - Circular economy					
E - Water					
E - Biodiversity					
S - Health & Safety					
S - Community impact					
S - Employees					
G - Governance	1		12		**13**
G - Compliance			8	2	**10**
G - Strategy			8		**8**
G - Risk management			2		**2**
G - Economic information					
G - Sustainability			2		**2**
G - Environmental			4		**4**
G - Social			1		**1**
Grand total	**1**		**37**	**2**	**40**

Standard description

The Corporate Sustainability Reporting Directive (CSRD) will impact many more companies than current EU non-financial reporting requirements (Non-Financial Reporting Directive, NFRD) and require more extensive disclosures on a broader range of environmental, social and governance issues. It is intrinsically linked to investor reporting regulations such as the SFDR, since the CSRD is meant to provide investors with the information needed for compliance. By requiring more companies to make mandatory sustainability disclosures, the CSRD is expected to bring sustainability reporting on par with financial reporting over time.

The CSRD significantly expands on the requirements of the NFRD and aims to close the gaps in the current information on the disclosure of non-financial information.

The scope of application is extended to all large companies and all companies listed on regulated markets, excluding listed micro-entities as defined by the Accounting Directive.

Sustainability reporting requirements will be further elaborated within European Sustainability Reporting Standards – developed by the European Financial Reporting Advisory Group (EFRAG) and provided to the European Commission for adoption through Delegated Acts.

ESRS will be developed in several sets. Set 1 will define reporting requirements for companies in all sectors under the CSRD. Future sets will consist of standards for specific sectors, SMEs and non-EU companies covered by the CSRD. The CSRD adopts a double materiality approach, considering both the impact a company has on the environment and society (impact materiality) and the extent to which sustainability factors affect the development, performance and position of the company (financial materiality). Under the CSRD companies must consider each materiality perspective when identifying information to be disclosed.

Key information required by the CSRD can be divided into the following topics:

- Companies must disclose their sustainability targets and the associated implementation strategy, including the associated financial and investment plans. This must show the extent to which the company's strategy contributes to the overarching European goals of transforming the EU into a modern, resource-efficient and competitive economy by 2050, with zero net greenhouse gas emissions and limiting global warming to 1.5 °C. The company must also disclose the overall resilience of its business model to sustainability issues and opportunities related to sustainability. In addition, the overall resilience of the business model to sustainability issues, as well as opportunities that arise in connection with sustainability issues, must be outlined.

- In addition, a description must be prepared regarding the implemented due diligence process against the background of sustainability aspects.

- Significant actual or potential impacts, risks and opportunities in connection with the company's value chain must be reported. All products, services, business relationships and the complete supply chain must be considered.

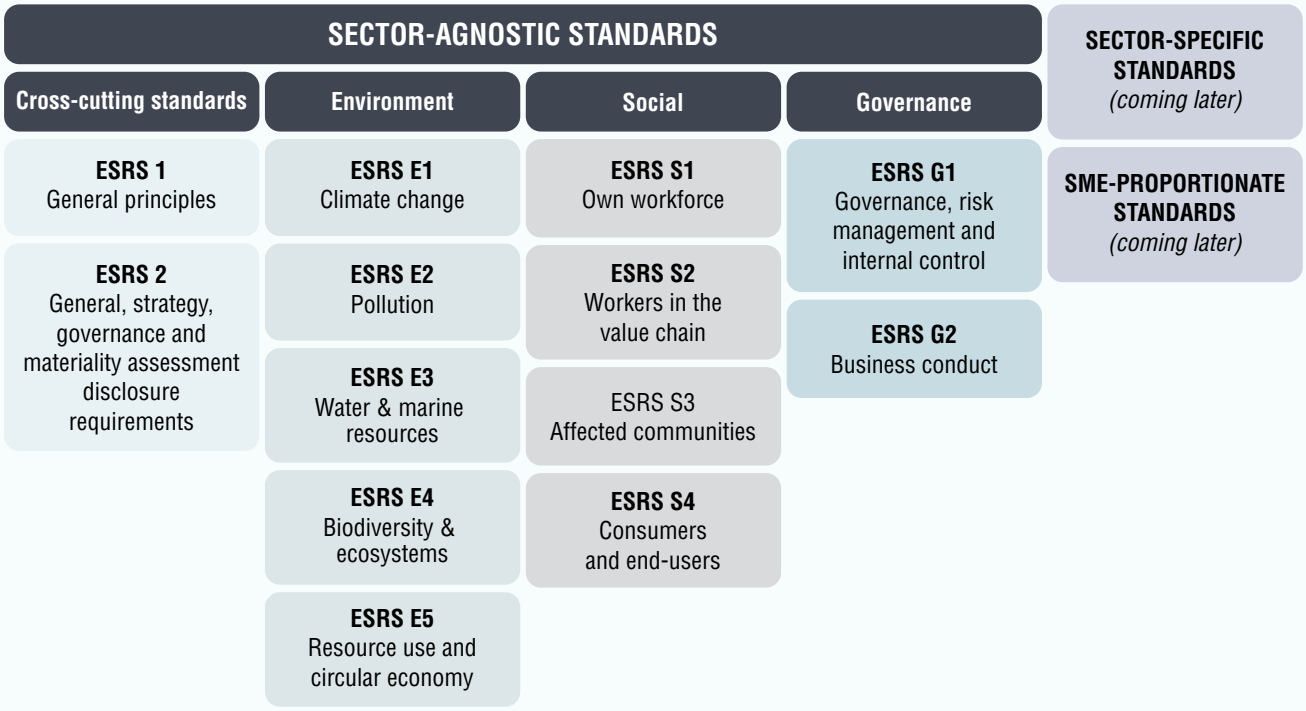
- Companies must report on their key intangible resources. These include all intangible resources on which the fundamental functioning of the company's business model depends, such as intellectual capital, human capital and relational capital. In addition, it must be explained why the respective aspect is of value to the company.

According to the CSRD, sustainability reporting must also be externally audited by third parties on the basis of forthcoming assurance standards.

As shown in the chart below, 13 cross-sector ESRS are currently being developed. The standards are divided thematically into the general category of cross-cutting standards – applicable to reporting on all sustainability issues – and t reporting on environment, social and governance issues. Sector-specific standards and SME-proportionate standards are being planned.

The 2 cross-cutting standards will contain fundamental concepts and principles for the preparation and presentation of sustainability statements. These include, for example, the concept of double materiality and requirements for including the entire value chain in reporting. In addition, ESRS 1 and ESRS 2 contain overarching disclosure requirements for embedding sustainability aspects in the strategy, business model, and corporate governance, and for identifying and managing material sustainability-related impacts, risks, and opportunities.

Figure 29: Overview of draft ESRS, as at April 2022



The other 11 reporting standards shown in the graphic above define the disclosure requirements in relation to specific sustainability issues. Note the environmental issues covered mirror those within the EU Taxonomy.

The following metrics provide an example of each environmental standard:

- ESRS E1 paragraph 37: The undertaking shall provide information on the energy intensity (total energy consumption per net revenue) associated with activities in high climate impact sectors.

- ESRS E2 paragraph 13: The objective of this Disclosure Requirement is to provide an understanding of the extent to which the undertaking has policies that address the identification, assessment, management and/or remediation of material pollution-related impacts, risks and opportunities.

- ESRS E3 paragraph 29: The disclosure required by paragraph 27 relates to own operations and shall include total water consumption in m3 in areas at material water risk, including areas of high-water stress.

- ESRS E4 paragraph 33: The undertaking shall describe the biodiversity and ecosystem-related targets it has adopted.

- ESRS E5 paragraph 36: The undertaking shall provide a description of the key products and materials that come out of the undertaking's production process and that are designed along circular principles, including durability, reusability, repairability, disassembly, remanufacturing, refurbishment, recycling or other optimization of the use of the resource.

Social standards focus on risks, opportunities and impacts related to various stakeholder groups, including the company's own employees, workers in the value chain, affected communities and consumers and end-users.

The following metrics provide an example of each social standard – note that only ESRS S1 contains metrics:

- ESRS S1 paragraph 51: The disclosure shall include a report by head count or full time equivalent (FTE) of permanent employees, and breakdowns by gender and by region.

- ESRS S2 paragraph 5: The disclosure shall include to what extent the disclosure covers the undertaking's upstream and downstream value chain.

- ESRS S3 paragraph 21: The undertaking shall disclose whether and how the perspectives of affected communities inform its decisions or activities aimed at managing actual and potential material impacts on communities.

- ESRS S4 paragraph 25: The undertaking shall describe its general approach to and processes for providing or contributing to remedy where it has identified that it has caused or contributed to a material adverse impact on consumers and/or end-users, including whether and how the undertaking assesses that remediation is effective.

The governance standard addresses the company's strategy and approach, processes and procedures as well as its performance relating to business conduct.

The following metrics provide an example of each governance standard:

- ESRS G1 paragraph 15: The disclosure shall include an overview of the procedures in place to prevent, detect, and address allegations or incidents of corruption/bribery.

- ESRS G2 paragraph 20: The disclosure shall cover a description of the mechanism for reporting concerns about unethical or unlawful behavior.

The ESRS tend to be more comprehensive and granular than other standards considered in this study.

13. Carbon Disclosure Project (CDP)

Key data	Description
Full name of standard	Carbon Disclosure Project
Category of standard	Thematic reporting standard
Type of standard	Corporate
Application	Voluntary
Stakeholder	CDP 'requesting authorities' (investor signatories, supply chain members, bank members, initiatives such as RE100 or NZAMi)
Reporting mechanism	Online Response System
Geographical application	Global
Structure	DP has three corporate questionnaires; climate change, forests and water security. The questionnaires provide a framework for companies to provide environmental information to their stakeholders covering governance and policy, risks and opportunity management, environmental targets and strategy, and scenario analysis. Companies in high-impact sectors (sectors that are deemed by CDP to have a significant environmental impact), in addition to the general questions, will be presented with questions specific to that sector.
Purpose	CDP is a not-for-profit charity that runs the global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts.
Real estate specific	Yes
Source of data	Organisation, supply chain, assets
Types of disclosure	Governance, implementation, science-based, financial
Version	2022
Issuing body	CDP
Scope of mapping	FS+RE+Construction sector scope: CDP Climate Change 2022 Questionnaire (FS) V1.4 CDP Climate Change 2022 Questionnaire (RE+Construction) V1.4 CDP Water Security 2022 Questionnaire (FS) V1.1 CDP Water Security 2022 Questionnaire (RE+Construction) V1.1 CDP Forests 2022 Questionnaire (FS) V1.3 CDP Forests 2022 Questionnaire (RE+Construction) V1.3 Full versions*
Additional information	Aligned with TCFD
Link	https://www.cdp.net/en

* The questionnaires can be generated for the three different topics, different sectors and also different stakeholders. The 'full version' used for the mapping in this study is for all three topics (climate change, water security and deforestation), for the real estate and construction industry as well as for the supply chain, bank, RE100 initiative and NZAMi stakeholders.

Overview of metric mapping

		E - Climate mitigation	E - Climate adaption	E - Pollution prevention	E - Circular economy	E - Water	E - Biodiversity	S - Health & Safety	S - Community impact	S - Employees	G - Governance	G - Compliance	G - Strategy	G - Risk management	G - Economic information	G - Sustainability	G - Environmental	G - Social	Grand total
Asset/ Investment	Define	3											1						4
	Describe	13				16	22												51
	Manage	20				48	59				10	15	4	12	3		11		182
	Measure	59				12	8								2				81
Portfolio/ Fund	Define	4				1													5
	Describe	15				13	22					4							54
	Manage	23				47	59				36	13	5	16	2		26		227
	Measure	64				11	8					1			11				95
Corporate	Define																		
	Describe																		
	Manage					3													3
	Measure																		
	Grand total	**201**				**151**	**178**				**46**	**33**	**10**	**28**	**18**		**37**		**702**

Standard description

CDP provides a comprehensive questionnaire for environmental reporting with a scoring option for eligible companies. The approach of the questionnaire is sector-focused and covers the three key areas of climate change, water security and deforestation. It can be used by companies, but also cities and governments as well as supply chain members.

CDP uses the scoring methodologies to incentivize companies to measure and manage environmental impacts through participation in CDP's climate change, forests, and water security questionnaires. Each of CDP's questionnaires has an individual scoring methodology. The responding companies are assessed on four consecutive levels which represent the steps a company moves through as it progresses towards environmental stewardship. The levels from lowest to highest level are: 1) Disclosure; 2) Awareness; 3) Management; 4) Leadership. If a company has earned Leadership status, it implements best practice as formulated by organisations working with CDP to advance environmental stewardship (e.g., CEO water mandate, CERES, WWF)[47].

As CDP caters to different stakeholders for different purposes, e.g., has strong underlying governance and risk management themes, but also a financial dimension and outcome-related metrics, its materiality can be seen as both financial and impact-related. In this light, some of the metrics resemble sustainable finance metrics (e.g.,venue/ capex/opex disclosures as required by the EU Taxonomy) and some are closer to science-based metrics (e.g., caeg, emissions per customer, emissions of biogenic carbon).

The construction and real estate-specific metrics are generally focused on climate-related metrics based on the underlying materiality allocation of CDP. In the following, an introduction to the questionnaires is provided to demonstrate some of the depth and thinking behind the scoring model.

Climate

The CDP's general climate changes questionnaire includes the following topics: governance, risks and opportunities, business strategy, targets and performance, emissions methodology, emissions data, energy, additional metrics, verification, carbon pricing, engagement and biodiversity.

The following metrics provide some examples of these:

- C3.5a Quantify the percentage share of your spending/revenue that is aligned with your organisation's transition to a 1.5°C world.
- C12.3c Provide details of the funding you provided to other organisations in the reporting year whose activities could influence policy, law, or regulation that may impact the climate.
- C12.4 Have you published information about your organisation's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).
- SC1.1 Allocate your emissions to your customers listed below according to the goods or services you have sold them in this reporting period.
- C10 Indicate the verification/assurance status that applies to your reported emissions.
- C4.3a Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO_2e savings.
- C4.5a Provide details of your products and/or services that you classify as low-carbon products.
- C6.7a Provide the emissions from biogenic carbon relevant to your organisation in metric tons CO2.
- C8.2m Provide details of the country-specific challenges to sourcing renewable electricity faced by your organisation in the reporting year.
- C8.1 What percentage of your total operational spend in the reporting year was on energy?
- C11.1 Are any of your operations or activities regulated by a carbon pricing system (e.g., ETS, Cap & Trade or Carbon Tax)?
- C11.1d What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?
- C11.3 Does your organisation use an internal price on carbon?

Water
The CDP's general water security questionnaire includes the following topics: corporate water accounting metrics, value chain engagement activities, business impacts, risk assessment procedures, risks, opportunities and responses to them, facility water accounting metrics, water governance and business strategy, targets and verification.

The following metrics provide some examples of these:

- W2.2 In the reporting year, was your organisation subject to any fines, enforcement orders, and/or other penalties for water-related regulatory violations?
- W4.1c By river basin, what is the number and proportion of facilities exposed to water risks that could have a substantive financial or strategic impact on your business, and what is the potential business impact associated with those facilities?
- W7.2 What is the trend in your organisation's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) for the reporting year, and the anticipated trend for the next reporting year?
- W7.4 Does your company use an internal price on water?

Deforestation (mapped to biodiversity[48])
CDP has a focus on deforestation as both deforestation and forest degradation account for approximately 15% of the world's greenhouse gas emissions. This is primarily driven by the global demand for agricultural commodities and therefore land for agricultural production. The risks represented by this is spread across worldwide supply chains as millions of products depend on agricultural commodities. The questionnaire focuses on four key forest risk commodities: timber, cattle products, soy, and palm oil. The questionnaire additionally allows disclosure by companies producing, sourcing or using cocoa, coffee, and rubber.

Examples of metrics include:

- F3 For your disclosed forest risk commodity(ies), provide details of risks identified with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.
- F4.3a What incentives are provided to C-Suite employees or board members for the management of forests-related issues (do not include the names of individuals)?
- F4.6 Has your organisation made a public commitment to reduce or remove deforestation and/or forest degradation from its direct operations and/or supply chain?
- F5.1 Are forests-related issues integrated into any aspects of your long-term strategic business plan, and if so how?
- F6.9 Are you working beyond your first-tier supplier(s) to manage and mitigate deforestation risks?
- F6.10a Indicate the criteria you consider when prioritizing landscapes and jurisdictions for engagement in collaborative approaches to sustainable land use and provide an explanation.

Construction and real estate
The CDP's construction and real estate sector questions focus on the following topics: assessment of buildings' life cycle emissions and embodied carbon emissions data, net zero carbon buildings; and investments in low-carbon R&D.

The following metrics provide some examples of these:

- C-CN6.6/C-RE6.6 Does your organisation assess the life cycle emissions of new construction or major renovation projects?
- C-CN6.6a/C-RE6.6a Provide details of how your organisation assesses the life cycle emissions of new construction or major renovation projects.
- C-CN6.6b/C-RE6.6b Can you provide embodied carbon emissions data for any of your organisation's new construction or major renovation projects completed in the last three years?
- C-CN6.6c/C-RE6.6c Provide details of the embodied carbon emissions of new construction or major renovation projects completed in the last three years.
- C-CN9.6a/C-RE9.6a Provide details of your organisation's investments in low-carbon R&D for real estate and construction activities over the last three years.

- C-RE9.9a Provide details of the net zero carbon buildings under your organisation's management in the reporting year.

- C-CN9.10/C-RE9.10 Did your organisation complete new construction or major renovations projects designed as net zero carbon in the last three years?

Financial Services
The CDP's reflection of Financial Services is most prominent in the climate change questionnaire.

Examples of metrics include:

- C-FS1.4 Does your organisation offer its employees an employment-based retirement scheme that incorporates ESG criteria, including climate change?

- C-FS2. 2e Indicate the climate-related information your organisation considers about clients/investees as part of your due diligence and/or risk assessment process, and how this influences decision-making.

- C-FS14.1b Provide details of the other carbon foot printing and/or exposure metrics used to track the impact of your portfolio on the climate.

- C-FS14.2a Break down your organisation's portfolio impact by asset class.

- C-FS14.0 For each portfolio activity, state the value of your financing and insurance of carbon-related assets in the reporting year.

- C-FS3.8a Provide details of the covenants included in your organisation's financing agreements to reflect and enforce your climate-related policies.

- FW-FS3.3 Do any of your existing products and services enable clients to mitigate deforestation and/or water insecurity?

14. Global Real Estate Sustainability Benchmark (GRESB)

Key data	Description
Full name of standard	Global Real Estate Sustainability Benchmark (GRESB)
Category of standard	Industry specific sustainability benchmark
Type of standard	Investment management
Application	Voluntary
Stakeholder	Investors
Reporting mechanism	Benchmarking Assessment
Geographical application	Global
Structure	The Real Estate Assessment generates two benchmarks: The GRESB Real Estate Benchmark and the GRESB Development Benchmark. The Real Estate Benchmark consists of participants completing both the Management and Performance Components and the Development Benchmark consists of participants completing both the Management and Development Components.
Purpose	The GRESB Real Estate Assessment is a global standard for ESG benchmarking and reporting for listed property companies, private property funds, developers and investors that invest directly in real estate. The GRESB Real Estate Assessment aims to provide investors with actionable information and tools to monitor and manage the ESG risks and opportunities of their investments, and to prepare for increasingly rigorous ESG obligations. Assessment participants receive comparative business intelligence on where they stand against their peers, a roadmap with the actions they can take to improve their ESG performance and a communication platform to engage with investors.
Real estate specific	Yes
Source of data	Organisation, tenants, building
Types of disclosure	Governance-based, science-based metrics
Version	2022 GRESB Real Estate Assessment
Issuing body	GRESB BV
Scope of mapping	2022 GRESB Real Estate Assessment mapped at a high level and not included in the detailed mapping exercise (please see 'Overview of metric mapping' below for further detail)
Additional information	The GRESB Standards Committees under the governance of the GRESB Foundation oversees the development and maintenance of GRESB Standards. The methodology aims to align with international reporting frameworks, such as TCFD, GRI and PRI.
Link	https://documents.gresb.com/generated_files/real_estate/2022/real_estate/reference_guide/complete.html

Overview of metric mapping

	Define	Describe	Manage	Measure	Grand total
E - Climate mitigation			16	14	**30**
E - Climate adaption					**0**
E - Water				6	**6**
E - Circular economy			5		**5**
E - Pollution prevention					**0**
E - Biodiversity					**0**
S - Health & safety			8		**8**
S - Community impact			8		**8**
S - Employees			8		**8**
G - Environmental					**0**
G - Social					**0**
G - Sustainability		8	12		**20**
G - Compliance					**0**
G - Governance					**0**
G - Risk Management		5	5		**10**
G - Strategy		7			**7**
Grand total		**20***	**60***	**20***	**100***

** 2022 GRESB Real Estate Assessment considered at a high level and not included within the scope of the detailed mapping exercise the assessment was considered to be a benchmarking assessment and therefore potentially not as comparable to some of the sustainability related reporting and financial reporting standards considered in the detailed mapping exercise. The high level mapping was therefore based on a high level mapping of the scoring methodology (with the high level mapping of the 'points' set out in the scoring methodology including rounding to the nearest integer): https://documents.gresb.com/generated_files/real_estate/2023/real_estate/reference_guide/complete.html#scoring_methodology*

Standard description

Real Estate Assessment Components

The Management Component - measures the entity's strategy and leadership management, policies and processes, risk management, and stakeholder engagement approach, composing of information collected at the entity level.

The Performance Component - measures the entity's asset portfolio performance, composing of information collected at the asset portfolio level. It is suitable for any real estate company or fund with operational assets.

The Development Component - measures the entity's efforts to address ESG-issues during the design, construction, and renovation of buildings. This component is suitable for entities involved in new construction (building design, site selection and/or construction) and/or major renovation projects, with on-going projects or completed projects during the reporting year.

GRESB does not require participation in any of the Assessment Components. However, if the entity does have both standing investments and development projects and considers itself both an operator of buildings and involved in development activities, it is highly recommended to participate in both benchmarks. As a result, participants will receive two GRESB Scores, two Benchmark Reports, two peer groups, etc. capturing how the entities approach their respective activities in both benchmarks.

The role of the GRESB benchmark

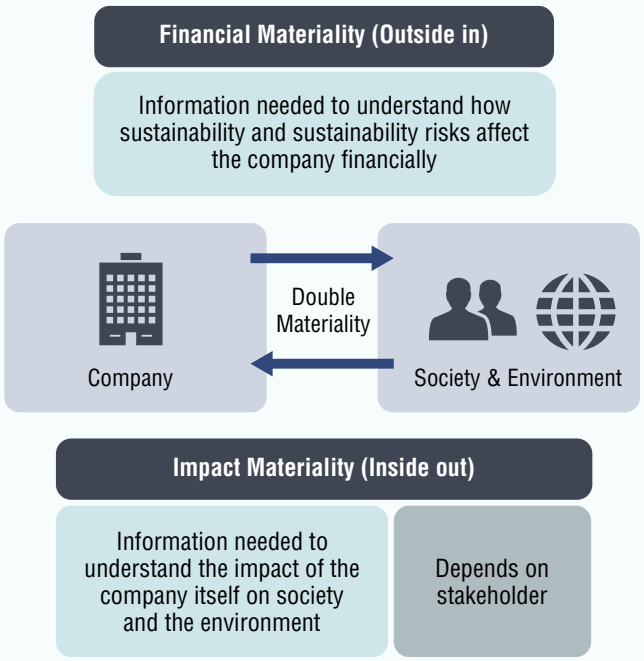
GRESB's global benchmark uses a consistent methodology to compare performance across different regions, investment vehicles, and property types. This consistency, combined with broad market coverage, aims to allow members and participants to apply a single, globally

recognised ESG framework to all their real estate investments.

GRESB results provide a practical way to understand ESG performance and communicate it to investors and other stakeholders. GRESB provides overall scores of ESG performance - such as the GRESB Score and GRESB Ratings - as well as detailed aspect-level and individual indicator-level assessments of performance. GRESB data should be analysed in peer group comparisons that take into account country, regional, sectoral and investment type variations. This analysis enables fund managers and companies to understand their results in the context of their investment strategies and communicate this to their investors.

GRESB facilitates the use of its ESG metrics in investment decision-making processes and encourages an active dialogue between investors, fund managers and companies on ESG issues. GRESB updates its Investor Member Guidance on an annual basis to assist GRESB Investor Members in their engagement with managers.

Figure 30: ESG in an international context



Appendix D: Further information on double materiality

Information is considered 'material' if it could influence the decision-making of stakeholders. The term 'double materiality' reflects the understanding of how certain risks and opportunities can affect not only the value of an enterprise, but also the people, the environment and the economy. This means that on the one hand, sustainability risks, such as climate change, can have a negative impact on business models, operations and financial results, but also may represent a development opportunity. On the other hand the business model and operations can have positive or negative impacts on the environment and society, such as improving community infrastructure.

Sustainability reporting, which considers double materiality and has a broader multi-stakeholder (e.g., businesses, investors, policymakers, and civil society) focus, is represented in the GRI reporting standards as well as jurisdictional initiatives such as European sustainable finance regulations (e.g., disclosure of certain information to assess a financial product's footprint regarding the SFDR principal adverse impact indicators against achieving the EU's goals within the context of the UN's 2030 agenda and the Paris Agreement).

Most financial disclosure standards have an investor focus and thus aim to give transparency to sustainability risks that impact the enterprise value. This includes the IFRS S1/S2, which complements the IASB financial reporting standards (IFRS). In contrast, the EU's CSRD does take double materiality into account, thus increasing pressure on the IFRS S1/S2[49,50] to also address the impact of sustainability risks on society and environment.

Generally, consensus is growing that a separation between inside and outside impacts is no longer possible. Especially EU regulations are strongly focused on outside impacts in order to achieve overarching sustainability goals, but also recognize – and even drive - the financial impacts by combining impact disclosures with financial disclosures.

Besides recognizing the inseparability of inside and outside impacts, another reason favouring of a comprehensive international baseline for corporate or investment reporting – beyond standardization – is to protect investors from the risk of greenwashing. Claims of positive societal and environmental impacts have to be aligned with actual data on the impact of the enterprise.

ENDNOTES

1 UN environment programme (2020).
2 Catella Group (2020).
3 PRI Association (2022c).
4 Financial Times (2022).
5 The Australian Financial Review (2022).
6 The Guardian (2022).
7 European Central Bank (2021).
8 Network for Greening the Financial System (2022).
9 U.S. Securities and Exchange Commission (2022).
10 For further information on the challenges induced to the real estate industry by the regulatory changes see 'Falling through the cracks: SFDR's impact on real estate investment', INREV (2023).
11 As an example for the efforts to standardisation of data, see INREV Sustainability Reporting Guidelines - https://www.inrev.org/guidelines/module/reporting#inrev-guidelines
12 European Union (2014b).
13 https://knowledge.uli.org/-/media/files/research-reports/2021/uli-zooming-in-on-the-s-in-esg-report.pdf?rev=4ff2b4625ca64a7093c87be771b369c3&hash=9C10332C4CFFE4D6E8C0FFB0FC580CF4.
14 See the 2022 consultation for the FCA's Sustainable Disclosure Requirements: https://www.fca.org.uk/publications/consultation-papers/cp22-20-sustainability-disclosure-requirements-sdr-investment-labels .
15 European Commission (2022b).
16 CRREM (2020).
17 UNEP FI et al. (2022).
18 European Commission (2021c).
19 National Stock Market Commission in Spain
20 GRESB (2022).
21 UK Green Building Council (2017).
22 A. Amiri et al. (2021).
23 U.S. Green Building Council (2022).
24 European Commission (2021b).
25 European Commission (2022a).
26 European Commission (2022c).
27 ESMA (2021).
28 International Organization of Securities Commissions (2021).
29 U.S. Securities and Exchange Commission (2022).
30 Larcker, D. et al. (2022).
31 Sustainalytics (2022) and MSCI (2022).
32 Financial Times (2020).
33 Platform on Sustainable Finance (2022).
34 European Union (2014a) and European Union (2011).
35 As an example, the German supervisory authority BaFin's consultation (13/2021) on sustainable investment funds, currently on hold until further legal clarity is achieved, available at BaFin (2021) , or SFDR Q&A, available at BaFin (2022).
36 Task Force on Climate-related Financial Disclosures (2022)
37 Submission to the FCA: ESG Metrics for Real Estate (2023)
38 CBI has developed and made available on its website an CO2 Target Calculator that enables issuers to ascertain the performance targets that must be satisfied in order to gain certification in their cities, available at Climate Bonds Initiative (2022a) and Climate Bonds Initiative (2022b).
39 Climate Bonds Initiative (2019).
40 Given the depth of the guidance, the scope for individual interpretation and number of references to other standards and initiatives, the disclosures contained in the guidance could not be captured reliably in the mapping overview.
41 European Commission (2021a).
42 European Commission (2010).
43 EU Technical Expert Group on Sustainable Finance (2020).
44 European Commission (2022a).
45 E.g., one criteria for acquisition and ownership of buildings requires that 'For buildings built before 31 December 2020, the building has at least an Energy Performance Certificate (EPC) class A. As an alternative, the building is within the top 15% of the national or regional building stock expressed as operational Primary Energy Demand (PED) and demonstrated by adequate evidence, which at least compares the performance of the relevant asset to the performance of the national or regional stock built before 31 December 2020 and at least distinguishes between residential and non-residential buildings.'
46 IFRS (2022).
47 CDP Scoring Introduction 2022, available at CDP (2022).
48 Deforestation is mapped to biodiversity, but the KPI biodiversity also includes overall questions on biodiversity from other questionnaires.
49 Global Reporting Initiative (2022).
50 ESMA (2022).

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