



ACTIVATING ALIGNMENT

Applying the G-20 Principles for Sustainable Finance Alignment with a Focus on Climate Change Mitigation

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Abbreviations

ACT (methodology) = Assessing low-Carbon Transition

AFOLU = agriculture, forestry, and other land use

ASEAN = Association of Southeast Asian Nations

BIS = Bank for International Settlements

capex = capital expenditures

CBI = Climate Bonds Initiative

CCS = carbon capture and storage

CCUS = carbon capture, utilization, and storage

CO₂ = carbon dioxide

COP26 = 2021 United Nations Climate Change Conference

COP27 = 2022 United Nations Climate Change Conference

CPI = Climate Policy Initiative

DNSH = do no significant harm

EC = European Commission

EHS = World Bank Environmental, Health, and Safety guidelines

EMDEs = emerging markets and developing economies

ESG = environmental, social, and governance

EU = European Union

G-20 SFWG = Group of 20 Sustainable Finance Working Group

GDP = gross domestic product

GFANZ = Glasgow Financial Alliance for Net Zero

GHG = greenhouse gas

GIIP = good international industry practice

Gt = gigaton

GtCO₂ = gigatons of CO₂

GtCO₂e = metric gigatons of CO₂ equivalent [queried]

GVA = gross value added

ICMA = International Capital Market Association

IEA = International Energy Agency

IFC = International Finance Corporation

IIGCC = Institutional Investors Group on Climate Change

ILO = International Labour Organization

IPCC = Intergovernmental Panel on Climate Change

ISIC = International Standard of Industrial Classification; ISIC codes

ISO = International Organization for Standardization

ISSB = International Sustainability Standards Board

KPI = key performance indicator
LIC = low-income countries
LT-LEDS = long-term low emissions development strategies
LULUCF = land use, land-use change, and forestry
MNE = multinational enterprise
MSMEs = micro-, small, and medium enterprises
MSS = minimum social safeguards
NACE code = standard European nomenclature of productive economic activities
ND-GAIN = Notre Dame-Global Adaptation Initiative
NDCs = nationally determined contributions
NGFS = Network for Greening the Financial System
OECD = Organisation for Economic Co-operation and Development
opex = operating expenses
OPIM = Operating Principles for Impact Management
PAT = Portfolio Alignment Team
R&D = research and development
R&D&I = research, development, and innovation
RBC = responsible business conduct
RCPs = representative concentration pathways
RCP2.6 = representative concentration pathway 2.6
SBTi = Science Based Targets Initiative
SDA = Sectoral Decarbonization Approach
SDGs = Sustainable Development Goals
SFC = Financial Superintendence of Colombia
SFDR = Sustainable Finance Disclosure Regulation
SFWG = Sustainable Finance Working Group
SMEs = small and medium enterprises
SSB = Sustainability Standards Board
TCFD = Task Force on Climate-Related Financial Disclosures
tCO₂-eq-1 = tons of carbon dioxide equivalent in a year
UNFCCC = United Nations Framework Convention on Climate Change
WRI = World Resources Institute



A GLOBAL PRESSING OBJECTIVE:

Strengthen the “climate information architecture” to support the transition to a low-carbon and climate-resilient economy



G-20 Principles for the development and coordination of alignment approaches

Asset-level, entity-level, and portfolio-level alignment approaches

They include, but are not limited to, taxonomies, transition planning frameworks, portfolio warming methodologies.

BUT

These approaches have spread globally, and at an increasing pace, leading to a vast array of methodologies, objectives, and governance frameworks underpinning them...this leads to: market fragmentation, increased transaction costs, data inconsistencies, greater greenwashing risks...ultimately missing the Paris Alignment goals.

SO

FOUNDATIONS OF OUR WORK

1. A robust, credible, and science-based grounding.
2. A right balance is struck between interoperability and local context and purpose.
3. Alignment approaches are unified by the overarching goal of achieving similar real-world decarbonization outcomes. Alignment should not merely lead to a redistribution of greenhouse gas emissions among financial market participants.
4. Specificities and status of emerging markets and developing economies (EMDEs) are accounted for.
5. Issues of supply chains (credibility of net-zero commitments, scaling up of investments in funding for climate mitigation in climate-vulnerable countries and in hard-to-abate sectors, special status of SMEs and inclusiveness) are addressed.
6. Contributions are made to the progress of efforts on global and regional standards for sustainability disclosures and financial instruments.

A practical approach to technical issues and options for the design and implementation of alignment approaches:

1. Greater level of detail strengthens the link between climate-alignment assessment methodologies and the financing needs and specificities of distinct regions and countries, especially in EMDEs.
2. This approach facilitates a higher degree of interoperability and a minimum degree of comparability across approaches around the globe.

Operationalizing the Principles

What are the main options for comparability, convergence, and credibility across alignment approaches? How can they form part of an ambitious transition finance framework ?



PRINCIPLE 1

Ensure material positive contribution to sustainability goals and focus on outcomes.

- Identifying and setting climate and environmental objectives
- Prioritizing sectors
- Referencing the translation of carbon budgets into benchmarks as part of portfolio-alignment methodologies
- Assessing GHG emissions and considerations for life cycle analysis
- Addressing just transition considerations
- Seeking consistency across statistical industry classifications for the design of asset- and entity-level alignment approaches



PRINCIPLE 2

Avoid negative contribution to sustainability goals.

- Adjusting DNSH (do no significant harm)/minimum safeguards for a variety of asset classes
- Applying a two-tiered approach: minimum ground (global and local regulations for minimum safeguards) and options (risk management approach such as IFC Performance Standards, set of E+S performance topics)
- Implementing a broader responsible business conduct due diligence and identification of due diligence priorities



PRINCIPLE 3

Be dynamic in adjustments reflecting changes in policies, technologies, and state of the transition.

- Updating and refreshing periodically alignment approaches considering evolving expectations and related governance recommendations
- Dealing with the legacy of green and sustainability-aligned bond instruments



PRINCIPLE 4

Reflect good governance and transparency.

- Ensuring quality and reliability in the application of alignment approaches through disclosures, data, and verification (mandatory disclosure requirements, disclosure of forward-looking information, and so on.)



PRINCIPLE 5

Be science-based for environmental goals and science- or evidence-based for other sustainability issues.

- Identifying the types, pros, and cons of a series of science-based foundations for alignment approaches (nationally determined contributions, sectoral decarbonization pathways, national and regional policies, and so on)



PRINCIPLE 6

Address transition considerations.

- Deciding how to embed supply chain criteria and targets in entity-level transition plans
- Ensuring that the content of transition plans is based on 7 pillars: setting net-zero and/or Paris temperature targets; grounding in a transition taxonomy or sectoral pathways; setting an implementation strategy; grounding in reliable and quantifiable metrics and targets; ensuring governance, transparency, and accountability; addressing adverse impacts; and addressing just transition challenges

Asset-level approaches

Entity-level approaches

Portfolio-level approaches



EXECUTIVE SUMMARY

The first action in the G-20 Sustainable Finance Roadmap proposes six high-level principles for the development and global coordination of approaches to align investments with sustainability goals. “Alignment approaches” are national and international frameworks for the financial sector that aim to monitor global sustainable finance flows and ensure that they are contributing to the temperature goals of the Paris Agreement, the Sustainable Development Goals (SDGs), and other international sustainable finance objectives. These approaches increasingly leverage “alignment tools,” which include but are not limited to (a) taxonomies (or classifications) of private sector activities that can be labeled as achieving environmental and social objectives; (b) certifications and labels that confirm that products or services have met environmental, social, and governance (ESG) standards; (c) disclosure frameworks that guide private sector entities to manage and report on their ESG performance; and (d) transition frameworks that help the private sector design a credible shift to low-carbon technologies and practices. The tools can then be *applied in different ways*—ranging from national-level regulations to voluntary private sector-led initiatives, to corporate-level practices. The tools can be applied by investors and finance providers for *different purposes at different levels*: at the “asset level” (as in determining whether a project or activity is compatible with a relevant sustainable finance taxonomy or due diligence framework); the “entity level” (as in whether a corporate or financial institution has a robust low-carbon transition plan and adheres to the International Labour Organization (ILO) Declaration on Fundamental Principles and Rights at Work); or “portfolio level” (as in whether an index is aligned with a credible temperature objective or supports poverty reduction). The G-20 Voluntary Principles for Developing Alignment Approaches provide a common foundation for ensuring these alignment approaches are robust and consistent.

The Voluntary Principles for Developing Alignment Approaches



1. Ensure material positive contributions to sustainability goals and focus on outcomes.



2. Avoid negative contributions to other sustainability goals (such as by doing no significant harm to any sustainability goal requirements).



3. Be dynamic in adjustments reflecting changes in policies, technologies, and the state of the transition.



4. Reflect good governance and transparency.



5. Be science based for environmental goals and science or evidence based for other sustainability issues.

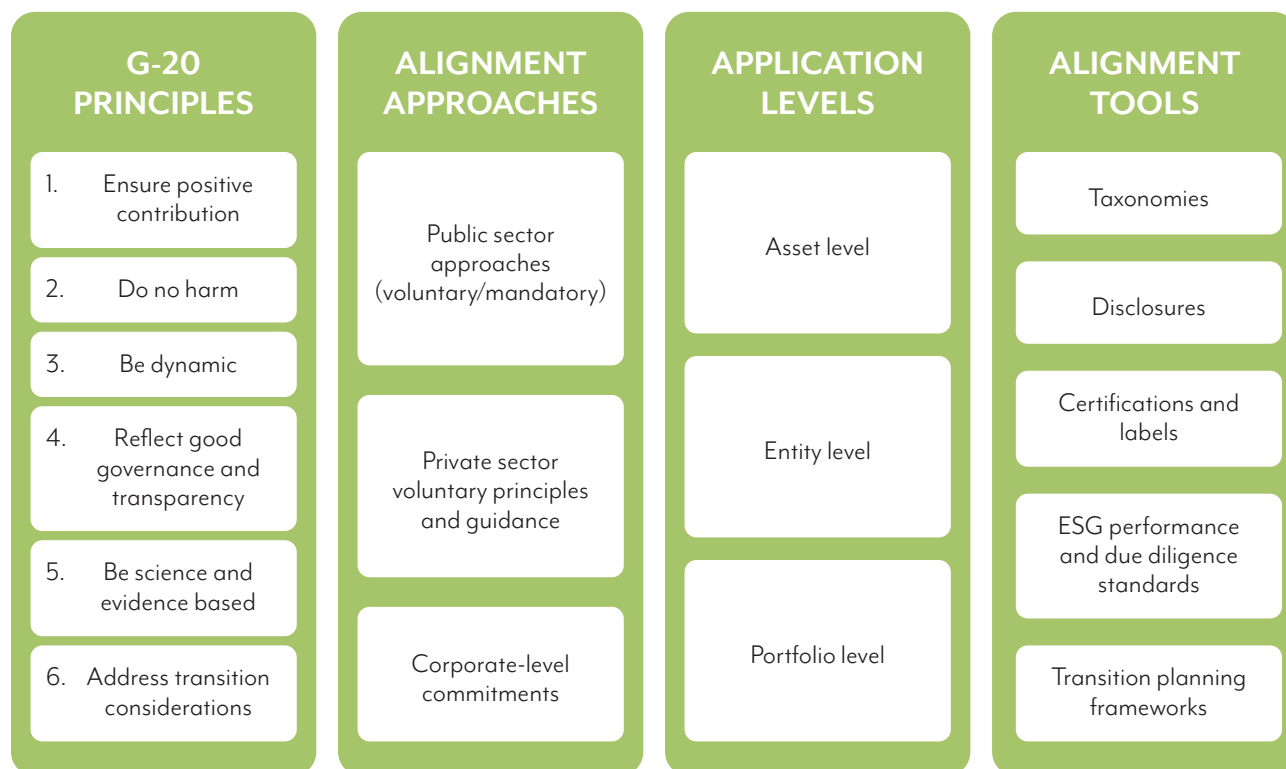


6. Address transition considerations.

Given the increasing diversity of alignment approaches, international organizations participating in the G-20 Sustainable Finance Working Group (SFWG)¹ agreed to analyze the Principles on the basis of experiences from developed countries, emerging markets, and developing economies. The goal of this analysis is to increase understanding of alignment approaches (how and when they can be used, how they link together), lessons learned, and highlight emerging good practices. This report presents the findings from that analysis. It offers a practical approach to certain technical issues and options for the effective design and implementation of alignment approaches. Although the approaches can apply to broader sustainability topics, the focus of the SFWG, and therefore this analysis, is primarily on achieving alignment with the temperature goals of the Paris Agreement. Key intersecting sustainability themes are acknowledged but are not covered in depth. The report aims to help relevant public authorities and private organizations to develop and improve sustainable finance alignment approaches. Ultimately, the effort aims to improve their effectiveness and interoperability, identifying core elements that could provide a minimum baseline of comparability across approaches, which may help reduce the risk of fragmentation in capital markets. The analysis in this report leverages the combined knowledge of the authors' participating organizations—notably, in relation to emerging practices across advanced economies as well as emerging markets and developing economies (EMDEs)—and captures the currently emerging complexities at the front lines of developing alignment approaches. The report does not seek to promote one type of approach over another, but identifies common principles and fundamental connections between them.

¹ Comprising the International Monetary Fund (IMF), World Bank, Organisation for Economic Co-operation and Development (OECD), and Bank for International Settlements (BIS).

Figure E.1: Levels of analysis for alignment approaches and tools



Source: Original figure for this publication.

Note: ESG = environmental, social, and governance.

Each of the alignment approaches has varying governance arrangements. Asset-level approaches can be top down and government led, such as national sustainable finance taxonomies, or bottom up and industry led. Several have mechanisms for future flexibility, which is an essential element. Entity-level approaches, such as transition frameworks and disclosure good practice, can be privately led and can leverage sector-level collaboration, or they can be regulator led, such as through stock exchange listing instructions, with increasing public initiatives to standardize their content and provide credibility to technically complex methodologies. Portfolio-level methodologies are highly variable: some are emerging as innovative and differentiating strategies by banks and investors; others are required by new regulations or guided by public-private initiatives. Portfolio-level methodologies are difficult to assess for quality even by sophisticated market participants, and the underlying reference data and aggregation methods vary because of market data gaps and evolving practices. There is growing recognition of the importance of market-level leadership and governance for sustainable finance, preferably through effective coordination between all relevant government agencies and private sector stakeholders.

Some lessons are emerging from global experience to date, including the following:

Asset-level approaches, such as taxonomies, may benefit from sector prioritization, particularly for those assets with high carbon intensity or exposure to transition risks and where funding gaps exist. Sectoral decarbonization pathways, such as the Sectoral Decarbonization Approach of the Science-Based Targets Initiative (SBTi), are a valuable tool that may be used at the asset, entity, and portfolio levels. However, the links across alignment approaches are complex (for example, a focus on taxonomy-aligned activities does not necessarily mean a sufficiently ambitious alignment with a 1.5°C or 2.0°C temperature trajectory, at least in the short to medium term). Aggregating asset- and entity-level climate alignment assessments when considering financial portfolios is also a complex exercise. Conducting assessments from a sectoral perspective can identify connections between assets related to globally shared decarbonization objectives, pathways, and scenarios.

A robust foundation of ESG risk management can help avoid negative contributions to other sustainability goals. Established and widely used approaches to ESG due diligence and risk management, supported by international conventions, (a) contribute to financial stability by reducing investment risk, (b) prevent greenwashing, and (c) prevent unintended or secondary negative impacts on society and the environment that can undermine progress on alignment. For example, in an asset-based alignment approach, a project that increases water availability should avoid significant harm to climate change goals (such as from additional greenhouse gas emissions) and ensure compliance with certain social safeguards (such as by avoiding human rights abuses). Emerging lessons indicate that existing standards and frameworks can underpin risk management requirements in alignment approaches and can support convergence in disclosure and data availability, thereby reducing the cost burden for adopting entities.

Alignment approaches should be inclusive of all parts of the global economy—particularly small and medium enterprises (SMEs), women, and vulnerable groups—and appropriate for EMDEs. Inclusivity can be considered during the design and maintenance of alignment approaches (such as consulting with SMEs, women, and marginalized groups), embedded in the criteria and metrics for assessing their success (such as the degree to which green finance reaches SMEs), and considered in the risk management and safeguard criteria (such as to “do no significant harm” to factors such as financial inclusion). Interoperability approaches should also account for the status of EMDEs, given they play a key role in global supply chain considerations and may have different low-carbon transition dynamics (such as sector performance standards, high carbon sectors, and social priorities). Strategic use of national taxonomies is crucial. Current alignment approaches often overlook the need to accelerate the decarbonization of hard-to-abate sectors and to support and improve the emission profiles of the SMEs that are key to supply chains in EMDEs.

Alignment approaches with robust, credible, and science-based grounding tend to be more comparable and interoperable. As a result, they will promote the development of sustainable finance markets, alleviate concerns about greenwashing risks across the world, and accelerate the funding of decarbonization in currently carbon-intensive economies.

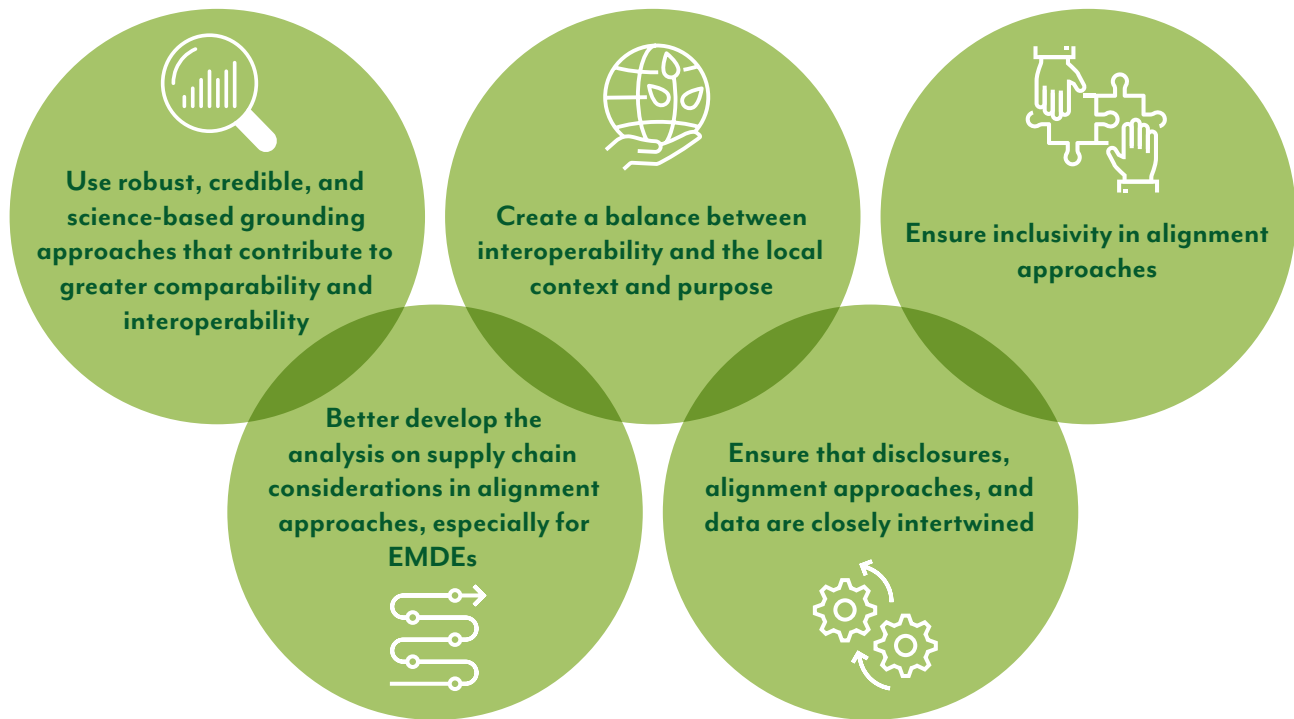
A balance between interoperability and the local context and purpose must be achieved. Alignment approaches may be developed for individual jurisdictions or at a regional level by considering factors such as (a) the characteristics and maturity of the market, (b) the existing regulatory context and regulator mandates, (c) the mix of green versus high-emitting sectors, (d) the national policy priorities, (e) the existing sector standards and regulations, (f) the priorities of local stakeholders, and (g) immediate versus future-use cases. However, interoperability of alignment approaches is critical to the progress of international efforts on global and regional standards for sustainability disclosures and financial instruments. Agreement on core elements of good practice as well as common agreed activities and performance expectations can facilitate cross-border investment by investors with significant impact capital.

Data remain a key challenge behind all alignment approaches. This report therefore highlights the close relationship between all alignment approaches and disclosure, which is the mechanism of choice for most markets to support the implementation, transparency, and credibility of sustainable finance. International convergence around disclosure requirements and decision-useful metrics can fast-track better-quality data that are comparable and available across industries, markets, and countries, helping pave the way for interoperable approaches.

Good design of alignment approaches needs to consider and balance:

- **Bottom-up and top-down approaches.** The benefit of voluntary approaches, which can stimulate private sector adoption and innovation, should be balanced against regulator interventions that can ensure alignment of the minimum standards with international targets and regional and sectoral low-carbon ambition.
- **Use cases.** The tailoring of use cases across jurisdictions depends on (a) the private or public sector institutional ability and technical expertise required; (b) the degree to which credible, forward-looking mid- and long-term transition plans can be captured on the basis of available data and public sector practices; (c) the particular institutional processes and mandates; (d) the related implementation costs (such as for SMEs); and (e) the desired flexibility to adjust and adapt to transition pathways as technology and supporting policy evolve.
- **Level of granularity.** Operationalizing the Principles requires a “middle lane” approach that finds the right balance between overly granular and overly flexible classifications. At a minimum, a common language is needed to determine the equivalence of specific features and to facilitate their use and recognition across different jurisdictions.
- **Level of application.** While science-based alignment measures (such as in taxonomies) and key financial instruments (such as green bonds) are mostly sector, activity, or project based, investors may find it more useful to receive clear signals about the sustainability performance and commitment of the entity as a whole (such as through ESG disclosure and transition plans) and to incorporate both asset- and entity-level disclosure into portfolio-level strategies. This approach indicates value in ongoing operationalization of the Principles across asset, entity, and portfolio levels.
- **Backward-looking and forward-looking approaches.** Further operationalizing the Principles may require both backward- and forward-looking elements to consider transition plans and verify the progress made. Combining backward- and forward-looking approaches could also be conducive to covering the whole-of-economy climate transition, including carbon-intensive sectors and EMDE-based issuers, where much of the potential for financing of decarbonization processes remains untapped.

Figure E.2: Foundations in implementing common principles for alignment approaches



Source: Original figure for this publication.

Note: EMDEs = emerging markets and developing economies.

The report recognizes that one size does not fit all and that a supporting policy environment is needed for alignment approaches to achieve their goal. While the findings of the report support the setting of targets, the report also allows for different pathways and sufficient flexibility with tiered options. The report also acknowledges that alignment approaches and the tools to apply them—even where they are compatible with the Principles—are not sufficient on their own to shift financial flows so that they are Paris aligned. A comprehensive, supportive policy environment is needed, including through fiscal and other public policy tools and incentives, emissions trading systems, improved data provision and digital developments, risk assessment tools, efforts to address “just transition” concerns, and other levers, as appropriate and according to country conditions.



The background of the entire page is a photograph of a vast, rolling landscape of green hills. The hills are covered in dense, vibrant green grass or low-lying vegetation. The terrain is undulating, with gentle slopes and a clear horizon line. The sky above is a pale, clear blue, suggesting a bright, sunny day. The overall atmosphere is one of natural beauty and tranquility.

EMERGING LESSONS AND CONSIDERATIONS

Applying Common Principles across Alignment Approaches— Rationale, Objectives, and Methodology

Synthesis Paper



A

Rationale

The Voluntary Principles for Developing Alignment Approaches



1. Ensure material positive contributions to sustainability goals and focus on outcomes.



2. Avoid negative contributions to other sustainability goals (such as by doing no significant harm to any sustainability goal requirements).



3. Be dynamic in adjustments reflecting changes in policies, technologies, and the state of the transition.



4. Reflect good governance and transparency.



5. Be science based for environmental goals and science or evidence based for other sustainability issues.



6. Address transition considerations.

In 2021, the G-20 Sustainable Finance Working Group (SFWG) was mandated by finance ministers and central bank governors to develop a Sustainable Finance Roadmap to focus the G-20 countries, international organizations, and other stakeholders on key priorities of the sustainable finance agenda. As a first action to promote market development, the G-20 Roadmap encouraged jurisdictions that intend to develop their own approaches to align investments with sustainability goals using a set of voluntary principles (G-20 SFWG 2021a). The Roadmap proposes six high-level principles for the development and global coordination of the approaches (the “Principles”).

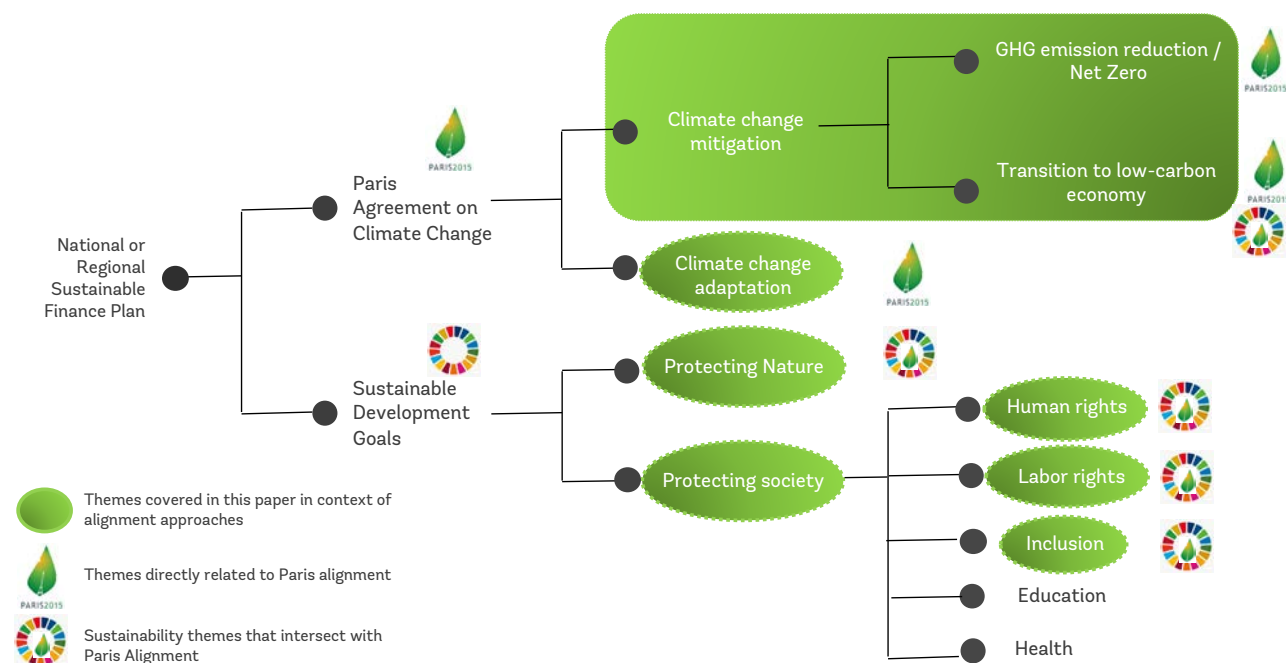
“Alignment approaches” aim to monitor and ensure that global sustainable finance flows are contributing to the temperature goal of the Paris Agreement, sustainable development goals (SDGs), and other international sustainable finance objectives. These approaches consist of various *alignment tools*—including taxonomies; environmental, social, and governance (ESG) scores; disclosure frameworks; and transition planning frameworks (when aligned with temperature objectives and other sustainability goals). These tools can be applied in different ways—ranging from national-level regulations to voluntary private sector-led initiatives to corporate-level practices. They are applied for different purposes at different levels: at the asset level (determining, for example, whether a particular investment is compatible with a relevant taxonomy); the entity level (for example, whether a corporate or financial institution has a robust low-carbon transition plan [CDP 2022]); or a portfolio level (for example, whether an index is aligned with a credible temperature objective). The Principles provide a common foundation for ensuring all approaches are robust and consistent however these tools are designed and implemented.

In developing the Principles, the SFWG recognized the diversity of alignment approaches and the challenges of linking those approaches together. As a result, the international organizations agreed to develop an analysis of the Principles to increase understanding of alignment approaches; to identify how and when they can be used and the linkages between them; and to share lessons learned, highlight emerging good practices, and improve interoperability and effectiveness. (See Action 3 of the Roadmap and Recommendation 3 of the Group of 20 [G-20] SFWG Synthesis Report [G-20 SFWG 2021a, 2021b].) Alignment approaches alone, even those conforming with the Principles, will not be sufficient to ensure that sustainable finance flows materially contribute to the Paris Agreement temperature goal and other sustainable finance goals. As the G-20 Roadmap also notes, broader policy support (including carbon pricing and non-pricing policies) and a comprehensive approach covering all types of finance are needed. Climate policies and finance are indeed complementary—and climate policies are a prerequisite for enabling private finance by sending a strong signal to market participants, which in turn contributes to the achievement of climate policy goals.

Although the approaches can apply to broader sustainability topics, the focus of the SFWG, and therefore this analysis, is primarily on achieving alignment with the temperature goals of the Paris Agreement—that is, the climate change mitigation goals—in line with article 2.1 of the Agreement (UNFCCC 2015).¹ However, intersections with other sustainability topics such as biodiversity and nature, climate change adaptation, and just transition also are important. Figure 1 outlines how the findings from this report fit within the broader ecosystem of international, regional, and national environmental and social objectives—namely, how countries and regions design their approaches to align with the Paris Agreement and sustainability goals.

¹ Please see the short glossary for definitions of how key climate terminology is used in this report.

Figure 1: Achieving alignment with the Paris Agreement



Source: Original figure for this publication.
 Note: GHG = greenhouse gas.

A variety of these alignment approaches have spread globally, and at an increasing pace. The number of asset-level alignment approaches, including taxonomies, has increased substantially, and while such approaches can apply to a range of purposes, they have primarily been designed with credit, listed equity, and corporate bond asset classes in mind. For example, green taxonomies define (among other environmental objectives such as biodiversity preservation and restoration, pollution prevention, and pollution control) the low-carbon or decarbonization nature of assets, activities, and sectors according to specific standards and technical criteria. Entity-level approaches are also developing rapidly and include transition planning frameworks and emission reduction assessment methodologies. Approaches at the instrument level, such as scores, labels, and certifications, as well as portfolio-level approaches (indexes and benchmarks, alignment metrics, and portfolio tools) have also seen rapid development (OECD 2022a).

That growth has led to a wide array of methodologies, objectives, and governance frameworks underpinning the alignment approaches (see table 1). The different approaches generally reflect differing national sustainable development plans and low-carbon pathways, sector focus, regulatory context, maturity of the financial sector, and immediate versus long-term use. The approaches can be voluntary or mandatory and can be led by government, industry, or international agencies or a combination of these entities.

For example, the Association of Southeast Asian Nations (ASEAN) taxonomy guidelines suggest a “traffic light” approach to defining low-carbon and transitional activities that can be adapted by members to fit their country context and can be applied at a principle-level or by using detailed technical criteria. Meanwhile, Indian authorities have taken a “two-tier” approach to their sustainability disclosure tool (outlining mandatory “essential” disclosures and “voluntary” disclosures), with application initially for large listed companies, and progressively widening in scope over time.

Although expansion may promote tailored approaches that are fit for purpose, development that occurs in silos may lead to market fragmentation, increased transaction costs, data inconsistencies, and greater greenwashing risks.² The latter refers to risks of misleading sustainability claims occurring and deceiving investors in their decisions. Yet, as underlined by ESMA (2023, 6), “pledges about future ESG performance, in particular net-zero commitments and so-called ‘transition plans’ are exposed to greenwashing risk.” In this context, there is a close connection between the need to ensure the quality of climate-related and sustainability disclosures and the development of a robust transition finance framework. If fragmented, ultimately such approaches would miss the overriding aim of article 2.1c of the Paris Agreement—that is, making financial flows consistent with a pathway toward low greenhouse gas emissions and climate-resilient development (Parente 2023).

This report does not promote one type of approach over another but rather identifies common principles and fundamental connections between them. Approaches would be unified by the overarching goal of achieving similar real-world decarbonization outcomes and ensuring that alignment does not merely lead to a redistribution of emissions among financial market participants. As emphasized by the IPCC (2022, 1553),

assessing climate consistency or alignment implies looking at all investment and financing activities, whether they target, contribute to, undermine or have no particular impact on climate objectives. This all-encompassing scope notably includes remaining investments and financing for high-greenhouse gas (GHG) emission activities that may be incompatible with remaining carbon budgets, but also activities that may play a transition role in climate mitigation pathways and scenarios.

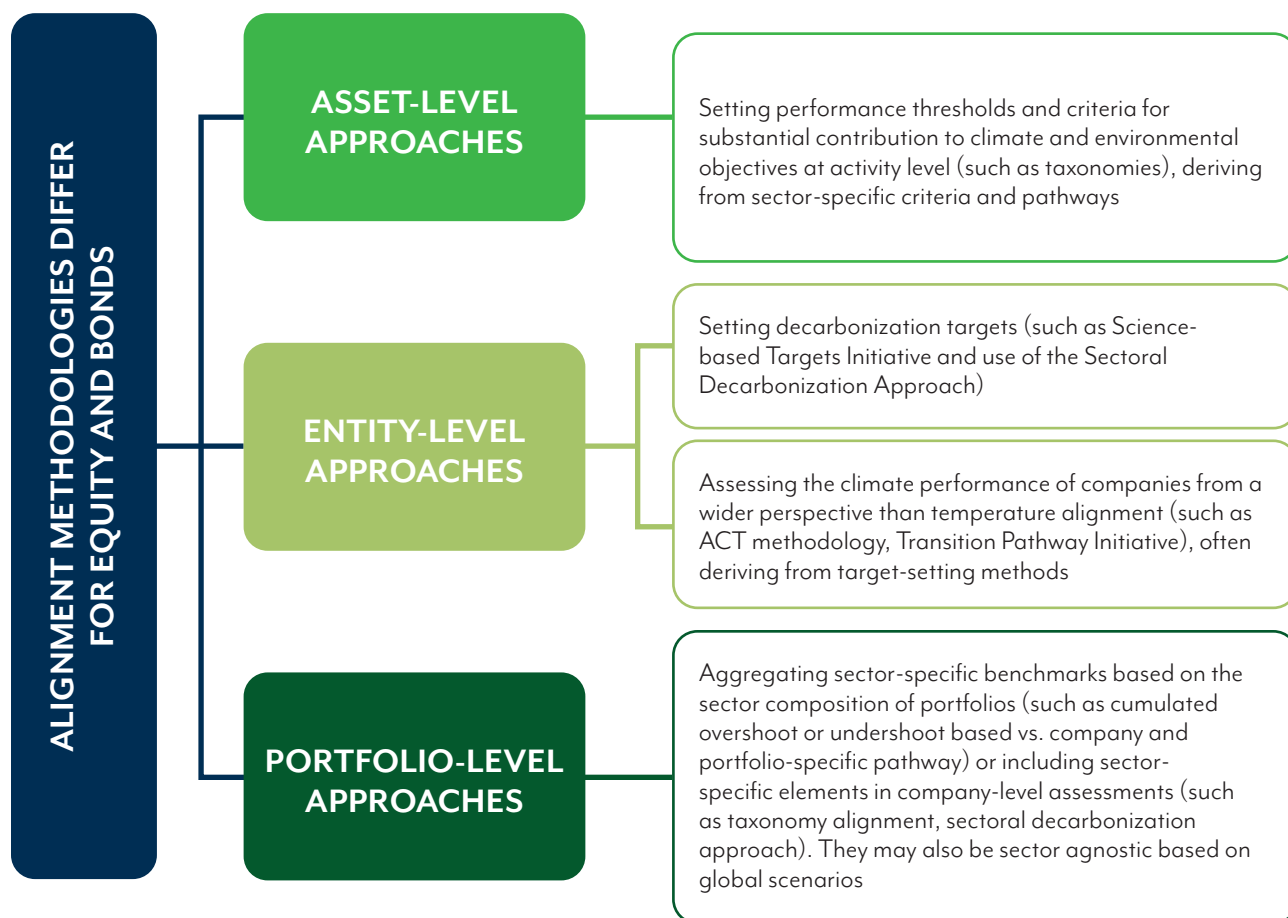
In addition, this report aims to capture emerging practices across developed, emerging, and developing economies and thereby reflect common principles, intersections, opportunities for interoperability, and practical areas of divergence to address differences in market maturity and local context.

Even where a common decarbonization goal exists, different jurisdictions will inevitably vary on the criteria they adopt under alignment approaches, leading to interoperability considerations. For example, jurisdictions have often set diverging criteria to assess the sustainability of energy sector-related activities (such as coal, natural gas, nuclear), either referring to specific emission thresholds or other sustainability criteria, or allowing for phasing out of fossil fuel-based electricity generation under specific circumstances. The challenge is to settle on a mechanism that promotes interoperability of approaches sufficient to enable a common language of comparison between alignment approaches and principles, to discern approaches that can be considered equivalent in terms of design, governance, and aspiration across regional and global contexts.³ This consideration applies in the context of one country’s alignment approaches (a transition taxonomy and plan framework, for instance) having a reach into a third country, as well as the context of disclosure requirements in one jurisdiction interacting with those of another (figure 2).

2 Creed and Horsfield (2021). Greenwashing risks would indeed be related to the credibility of the corporate entity’s decarbonization pathway, which should be science based and testable (credibly demonstrated). The Climate Bonds Initiative (CBI) underscores that incomplete disclosure that is not aligned with the climate science and credibly demonstrated raises “concerns for investors as [it] makes it difficult to determine whether the company is making a comprehensive transition or just ‘cherry-picking’ low-hanging fruit, which would raise questions over greenwashing” (Creed and Horsfield 2021, 13). Climate alignment approaches aim at tackling situations in which “oftentimes environmental claims made by companies are expressed very vaguely and may include inaccurate information as an effort to attract a ‘green’ audience” (Dimitrieska, Stankovska, and Efremova 2017).

3 As an example, the United Kingdom has recently proposed a three-level interoperability mechanism, relating to the future UK Taxonomy’s technical screening criteria and related disclosure, and advocating for harmonization across taxonomies to foster international cooperation. The report states, “It is crucial not to neglect the value of harmonization, while also noting that harmonizing taxonomies without taking local context into consideration could result in misaligned incentives for national decarbonization goals. Finding a balance between harmonization and a tailored approach ... is vital in ensuring that taxonomies are both effective and relevant.” See Green Technical Advisory Group (2023).

Figure 2: Three main categories of alignment approaches for climate change mitigation



Source: Original figure for this publication.
 Note: ACT = Assessing low-Carbon Transition.

It is a global imperative to strengthen the “climate information architecture” to support the transition to a low-carbon and climate-resilient economy (Barnett, Brock, and Hansen 2020; Carbone et al. 2021; Ferreira et al. 2021). Financial markets associated with climate change face major information challenges (Eren, Merten, and Verhoeven 2022). These challenges include a lack of relevant, decision-useful information, with limits to data quality, comparability, and consistency. Ensuring links between alignment approaches and disclosures, to enhance the efficiency and relevance of science-based information, is a key policy objective for the sound and robust development of sustainable finance. Developing the right policy response and obtaining financing require not only relevant and high-quality information, but also increased adoption and use of such information. Adoption and use of that information also require efforts to improve the level of understanding and capacity of the main stakeholders best placed to use the information. Improved data on climate-related risks can also provide robust, valuable information that can improve the comparability and consistency of use (NGFS 2022b). However, alignment approaches may require information that is not covered by disclosure regimes. For many alignment approaches, a first priority is to enable more and better information in the market—including, but broader than, that which can be obtained from disclosure regimes—to support alignment efforts by investors and other financial market participants (OECD 2021). For this reason, alignment approaches may be premised on obtaining or verifying sustainability data, such as ESG scoring, indexes, and verification

approaches (Avramov et al. 2022), or may be developed with the goal of generating a certain type and quality of data (such as disclosure regulations, including transition plan frameworks and taxonomies of aligned activities and technologies). This report therefore highlights the close relationship between alignment approaches and disclosure.

The various alignment approaches each serve important purposes and share common features (OECD 2020).

These include science-based transparency, benchmarking for capital allocation purposes,⁴ transition planning and investment decision-making in view of climate and environmental objectives, and anti-greenwashing functions (Cardona and Berenguer 2020). The commonality of these approaches lies in their ultimate purpose, which is to allow investors and other financial market participants to identify high- and low-carbon real and financial assets, and to assess the impact of low-carbon investment strategies to reduce greenhouse gas emissions discharged in the real economy, including the private sector (D’Arcangelo et al. 2022). Well-coordinated alignment approaches may also promote better comparability of portfolio-level GHG exposures (Noels and Jachnik 2022) and provide a useful starting point for other capital allocation or risk management tools, such as standardized classifications of high-emitting assets.⁵

An emerging concern is to ensure that alignment approaches are designed in a way that includes all parts of the economy (IFC 2013).

Those parts include small and medium enterprises (SMEs), women, youth, households, and vulnerable groups and communities. Inclusivity is a priority for many emerging markets and developing economies (EMDEs) because of the significant role played by SMEs in these markets and the heightened risks posed to vulnerable segments of society by climate change. This focus is evidenced by efforts on the part of regulators to (a) measure the impacts of climate change on vulnerable groups and households, (b) ensure that alignment approaches include sectors and activities that are accessible to these groups as both participants and beneficiaries, and (c) support climate-focused investment strategies that contribute to inclusion and climate change mitigation at the same time (Volz et al. 2020; Inclusive Green Finance Working Group and University of Luxembourg 2022). Inclusion can be considered during the design of alignment approaches by considering both risks and opportunities related to SMEs and vulnerable groups. It can also be embedded in the criteria and metrics for assessing the success of alignment approaches. Measures may involve tracking positive contributions to inclusion as well as ensuring that unintended negative impacts on inclusion are quickly identified and addressed. For instance, onerous technical criteria and reporting requirements are more likely to exclude SMEs and vulnerable groups. Similarly, alignment approaches that favor sectors, activities, and technologies that typically feature large infrastructure projects are less likely to offer opportunities for participation by all parts of the economy. Financial intermediaries and larger companies in SMEs’ supply chains can also play a supportive role for SMEs. Finally, the risk management and safeguard criteria, such as “do no significant harm” and minimum social safeguards in alignment approaches can consider inclusion. One of the ways to foster inclusion in alignment approaches is to make sure that potentially marginalized groups are included as stakeholders in the design process and during implementation.

4 The persistent misallocation of capital (Robins 2022) needs to be addressed to fulfill the goal of the Paris Agreement’s Article 2.1c (“making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development”). As pointed out by (Songwe, Stern, and Bhattacharya 2022, 70), “applying to all forms of finance and all instruments, the clause has not been operationalized to the same degree as others in the treaty: the UNFCCC process does not provide a space to fully articulate definitions or develop requirements for reporting on the consistency of financial flows (as with Article 9 on climate finance from developed to developing countries). Despite strong momentum, finance flows remain heavily misaligned.” In this context, it is relevant for “improving methodologies and standards to bring clarity and transparency around delivering Article 2.1c, and to improve interoperability across different approaches and with other tools (such as transition finance and taxonomies)” (Songwe, Stern, and Bhattacharya 2022, 70).

5 On risk management, BCBS (2021) provides useful commentary on the usefulness and limitations of current classification schemes. “Climate-risk-specific heterogeneity adds complexity which is not well reflected in most established risk classifications. For example, current activity- or industry-based classifications do not incorporate the locations of constituent components as a differentiating feature, which can limit their relevance for purposes of physical risk differentiation. Therefore, a climate risk classification would need to account for context-specific features salient for assessing the sensitivity of exposures to climate-related factors. Moreover, compared to most traditional risk classification systems which are less frequently updated, a climate risk classification may need to incorporate dynamic features that respond to future changes in the distribution of climate impacts and evolutions in technological frontiers, or the classification could incorporate provisions for a periodic refresh of selection criteria. It is important to emphasize that classifications are not sufficient on their own to map and monitor risk exposure or to estimate the financial impact stemming from climate risks. Notably, these classification schemes can help rank order exposures according to relative risk vulnerability criteria, but do not determine how to grade those exposures along judgmental criteria for risk.”

Properly functioning alignment approaches that deliver clear information to investors on risk and impact can actually drive down the cost of capital, which is key to driving the transition in the real economy (Wissenburg et al. 2021). Sustainability performance may influence capital allocation (Inderst, Kaminker, and Stewart 2012), with preferences being expressed not only in traditional bond, loan, and equity markets but also in dedicated markets for sustainable products. Where firms undertake sustainability disclosures, markets tend to react positively to such disclosures. There is also a future benefit to the market from improved disclosure that allows regulators and financial market participants to analyze the relationships between sustainability performance, financial performance, and business risk. Several studies to date show that sustainability-focused finance may be linked to lower credit risk for financial institutions and may lead to outperformance for investors.⁶ Robust, comparable, and verified data are required to understand the causal links, which can then reinforce investment strategies that aim for both financial returns and alignment ambitions. Finally, data are also critical for understanding whether alignment approaches are (a) achieving their intended outcomes, such as capital flows to prioritized activities and positive impacts on people and the environment, or (b) resulting in unintended negative outcomes, such as discouraging alignment because of complex requirements or excluding certain segments of the market, such as SMEs, women, youth, and vulnerable groups. This information can be used by regulators to adjust their approaches accordingly over time.

Aggregating asset- and entity-level climate alignment assessments when considering financial portfolios is a complex exercise (Portfolio Alignment Team 2020). However, conducting climate or sustainability assessments from a sectoral perspective can identify connections between assets related to globally shared decarbonization objectives, pathways, and scenarios (Teske et al. 2020). Given the variety of transmission mechanisms through which sustainable finance can influence the decarbonization of the real economy—such as cost of capital, access to liquidity, and changing corporate practices (Caldecott et al. 2022)—alignment approaches can offer predictability and transparency for a variety of asset classes (public and private equity, debt, and real assets). They may also provide valuable tools for conducting forward- and backward-looking assessments of climate alignment, for target setting and steering action, and for monitoring and reporting on progress along a trajectory. A complementary approach can also reduce compliance cost burdens and promote innovation in the use of the data produced by the different alignment approaches. In the absence of an overarching governing framework for interoperability, these Principles and this report can offer a common language and promote the convergence of good practices.

Asset-level approaches, such as taxonomies, may benefit from focusing on sectors, particularly those with high carbon intensity or exposure to transition risks. Sectoral decarbonization pathways, such as the Sectoral Decarbonization Approach of the Science-Based Targets Initiative (SBT 2015), are also a valuable tool that may be used at the asset, entity, and portfolio levels. However, a focus on taxonomy-aligned activities does not necessarily mean alignment with a 1.5°C or 2.0°C temperature trajectory, at least in the short to medium term (Institut Louis Bachelier 2020). A portfolio initially may have exposure to carbon-intensive assets that are not taxonomy aligned, but with the application of a trajectory alignment method (see box 1), the portfolio may progressively decrease its carbon intensity in line with the Paris Agreement temperature goals. In addition, other alignment approaches may also have a particular sectoral and geographical focus, such as temperature alignment methodologies with sector-specific benchmarks. These examples show the complexity and the links across alignment approaches that are the targets of this analysis.

6 For examples, see Biffis and Rocciolo (2020); Dunz, Naqvi, and Monasterolo (2021); Kleimeier and Viehs (2018); Kölbel et al. (2022); Santi (2023); and Yu, Van Luu, and Chen. (2020). Note also the findings of Takahashi and Shino (2023) on Japanese banks significantly decreasing lending to higher GHG-emitting firms.

Box 1: Different ways to assess alignment with the Paris Agreement

These methods are not mutually exclusive and may apply to the same alignment approach.

Alignment by temperature trajectory. This method consists of aligning with a chosen temperature, such as 2°C, and assessing how compatible a company, asset, or portfolio is with meeting that trajectory. Multiple trajectories could be chosen to maintain the target temperature, and multiple variables can affect the trajectory, including the rate of decarbonization, the rate of economic activity and growth, the timing and nature of the peak of greenhouse gas emissions, the role of emission removal, and the overall time horizon and scope of decarbonization (Institut Louis Bachelier 2020).

Alignment with the temperature goals of the Paris Agreement. Criteria for this category are slightly more prescriptive as they apply to the 1.5°C limit. Global peaking takes place as soon as possible, there is limited reliance on emissions removal, and natural carbon sinks must play a role (Institut Louis Bachelier 2020).

Alignment with the broader goals of the Paris Agreement. This method encompasses the broader objectives of Article 2 of the Paris Agreement, which look at more than just the temperature target. These include (a) fostering climate change adaptation and resilience without threatening food production and (b) making finance flows consistent with a pathway toward low greenhouse gas emissions and climate-resilient development.

Each of the alignment approaches has varying governance arrangements. Asset-level approaches have widely varying governance mechanisms, ranging from top-down government-led to bottom-up industry-led approaches. Several have mechanisms for future flexibility, which is an essential element, including sector-based decarbonization pathways and clauses for evolution of alignment criteria to account for scientific and technological developments. Entity-level approaches, such as transition plans, are typically privately led despite increasing public initiatives to standardize their content. Given the technical complexity of these, credibility of the methodologies is essential. Consequently, they may come under more formal regulation over time. Portfolio-level methodologies are highly variable and stem primarily from public or public-private initiatives. They are difficult to verify, even by sophisticated market participants, and the underlying reference data and aggregation methods remain fluid. Other key features of alignment approaches are summarized in table 1.

Table 1: Key features of alignment approach categories

Alignment approach category	Examples	Relevance to financial market participants	Data-related challenges	Factors influencing the effectiveness of achieving GHG emission reduction goals
Asset-level approaches	ICMA Green Bond Principles, Social Bond Principles, Sustainability Bond Principles, taxonomies, and similar types of classifications at sector and activity levels.	A wide range of potential uses that includes promoting transparency and disclosure and labeling products such as bonds. Such approaches can indicate entity- and portfolio-level activities contributing to decarbonization and feed into entity- and portfolio-level approaches.	Data consistency and availability depend on a series of factors in the design and the application of these approaches: level of detail; link to disclosure requirements; consistency across statistical classifications; and coverage across supply chains, assets, and companies.	Effectiveness depends on the ambition and stringency of the criteria for substantial contribution. It also should be based on measurable outcomes through disclosed and technology-neutral key performance indicators.
Entity-level approaches	Transition plans as well as entity-level GHG emission reduction assessments based on company-level emission intensities compared with time series of sector-level benchmarks under selected scenarios (for example, IEA scenarios).	The main objective is to demonstrate if it is credible that the entity will achieve a climate-related target and to support accountability to internal and external stakeholders. These approaches may allow investment strategies to be based on an entity-specific assessment and may feed into a transition risk assessment, in combination with other methods.	Data-related issues are numerous, from assessing backward-looking GHG emissions to incorporating scenario-based forward-looking analyses.	Effectiveness depends on the level of transition performance, coherence with sectoral decarbonization pathways, and potentially other trends such as global temperature targets, nationally determined contributions, and trends over time.

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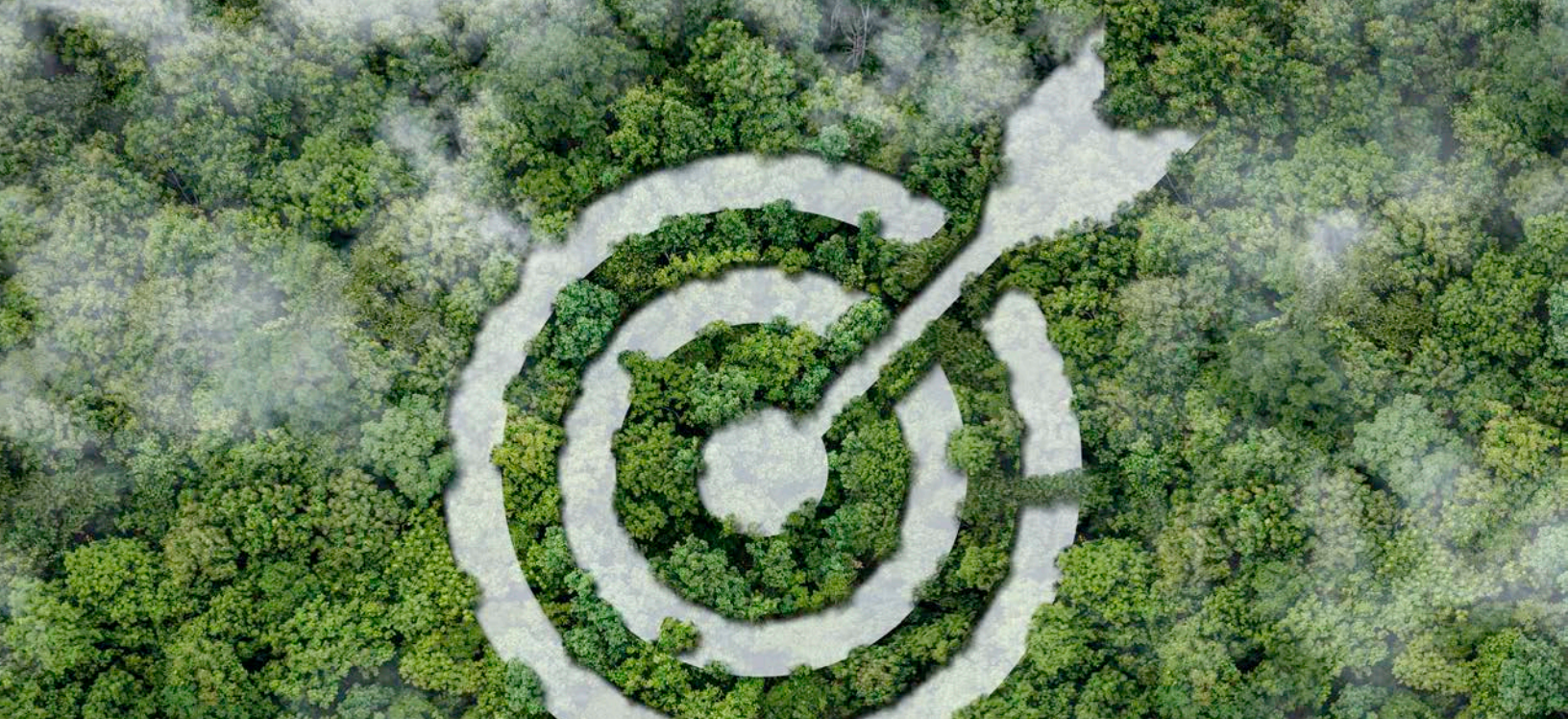
Alignment approach category	Examples	Relevance to financial market participants	Data-related challenges	Factors influencing the effectiveness of achieving GHG emission reduction goals
Portfolio-level approaches	Portfolio alignment methodologies (GHG emission reductions, temperature pathways, warming metrics).	These methodologies allow for climate-related alignment assessment of investment portfolios and products, allowing investors and lenders to assess the position of companies and portfolios on the path to net zero, ^a to compare them with peers, and to track progress over time.	Entity-level alignment assessment is the key input to these approaches (for example, some portfolios' warming methods would aggregate company-level absolute cumulative over- or undershoot based on ownership share before converting to a portfolio warming metric), in addition to challenges in determining and disclosing Scope 3 GHG emissions. In addition, alignment assessments of financial portfolios require the assessment of each individual asset in order not to obscure poor-performing portfolio segments, leading to challenges related to coverage gaps, methodological inconsistencies, and double-counting risks. Updating of underlying reference scenarios, especially at the country and sector level, remains an open issue.	Overall GHG emissions may indeed be lower for an aligned portfolio cumulated over a given time horizon, but it requires more granular assessment on concrete outcomes at the sector level. Issues arise related to the chain of causality and additionality of investors' actions, depending on the initial exposure, the investment approach adopted (engagement with carbon-intensive companies vs. investment in less-emitting companies), the critical size in assets under management, and the compatibility with temperature pathways.

Sources: Original table for this publication.

Note: GHG = greenhouse gas; ICMA = International Capital Market Association; IEA = International Energy Agency.

a. Climate policy ambition is increasingly expressed as a specific target date for reaching net-zero emissions, typically linked to the peak temperature goals of the Paris Agreement. However, the net-zero objective is not included in the Paris Agreement itself, although it is intrinsically a scientific concept (Fankhauser et al. 2021). Following analysis by the IPCC (2018), under the Paris Agreement countries have agreed to limit global warming to well below 2.0 °C and make efforts to limit it to 1.5 °C. Meeting the 1.5 °C goal with 50 percent probability translates into a remaining carbon budget of 400–800 gigatons of carbon dioxide (CO₂). Staying within this carbon budget requires CO₂ emissions to peak before 2030 and fall to net zero by around 2050.

One important point is that alignment approaches alone, even those conforming with the Principles, will not be sufficient to ensure that sustainable finance flows materially contribute to the Paris Agreement temperature goal and other sustainable finance goals. As the G-20 Roadmap also notes, broader policy support (including carbon pricing and non-pricing policies) and a comprehensive approach covering all types of finance are needed (including actions to improve data provision, risk assessment tools, policy incentives, and related support, including for digital developments and for addressing “just transition” concerns). Climate policies and finance are indeed complementary—and climate policies are a prerequisite for enabling private finance by sending a strong signal to market participants, which in turn contributes to the achievement of climate policy goals (Chateau, Jaumotte, and Schwerhoff 2022).



B Objectives

As a first step, this report provides a greater level of detail on asset- and entity-level approaches to enable as strong a linkage as possible between climate-alignment assessment methodologies and the financing needs and specificities (such as industrial composition, mitigation, and adaptation challenges) of distinct regions and countries, especially in EMDEs (IEA 2021; WEF 2022). It aims to facilitate a higher degree of interoperability and a minimum degree of comparability across approaches around the globe. It also provides some, albeit less extensive, references to portfolio-level methodologies, which remain the focus of ongoing work at a global level because of their technical complexity.

The following sections describe foundational elements that were based on joint research and analysis and close collaboration with stakeholders, including country authorities in EMDEs.

First, alignment approaches with robust, credible, and science-based grounding tend to be more comparable and interoperable. As a result, they will promote the development of sustainable finance markets, alleviate concerns about greenwashing risks across the world, and accelerate funding of decarbonization of currently carbon-intensive economies (NGFS 2022a).

Second, the right balance between interoperability and the local context and purpose must be achieved. Alignment approaches may be developed for individual jurisdictions or at a regional level by considering factors such as (a) the characteristics and maturity of the market, (b) regulatory mandates, (c) existing regulatory context, (d) national policy priorities, and (e) immediate and future-use cases. It is therefore important to find the right balance between common principles and detailed requirements for such approaches.

Several interoperability approaches have been proposed that aim to achieve this balance for taxonomies, ranging from no interoperability to a middle ground of some interoperability, where activities or investments are assessed against each jurisdiction's own taxonomy, and to "hard equivalence" with one taxonomy, such as the European Union (EU) Taxonomy, which may have the effect of penalizing EMDEs (Green Technical Advisory Group 2023).

Third, interoperability approaches should account for the status of EMDEs. EMDEs play a key role in supply chain considerations, including consideration of the specific economic and financial structures of EMDEs, which are often dependent on international trade. The link between taxonomies in this regard is crucial, especially links between advanced economies and EMDEs. The current asset-level alignment approaches generally focus on already low-carbon activities, making it more difficult to effectively support the transition financing needs that are particularly relevant for EMDEs. These approaches also depart from different starting points, with a variety of both economic development and transition pathways (some of them recognized ab initio by science-based scenarios). They are also characterized by specific economic, industrial, and financial structures that make their financing needs for decarbonization somewhat unique, considering their insertion in global supply chains. Current alignment approaches, though they may adopt a whole-economy approach, often overlook the need to accelerate the decarbonization of hard-to-abate sectors (that is, steel, cement, chemicals, heavy transportation) in these economies and to support and improve the emission profiles of SMEs that are key to supply chains in these countries. The Multilateral Development Bank (MDB) approach to Paris Agreement alignment may have some emerging lessons for EMDEs and SMEs.⁷ One foundational element of the approach is on striking a balance between interoperability and the local context (including the characteristics and maturity of the market, regulatory context, national policy priorities, and so on). Continuous support to ensure suitable levels of ambition is also a foundational element.

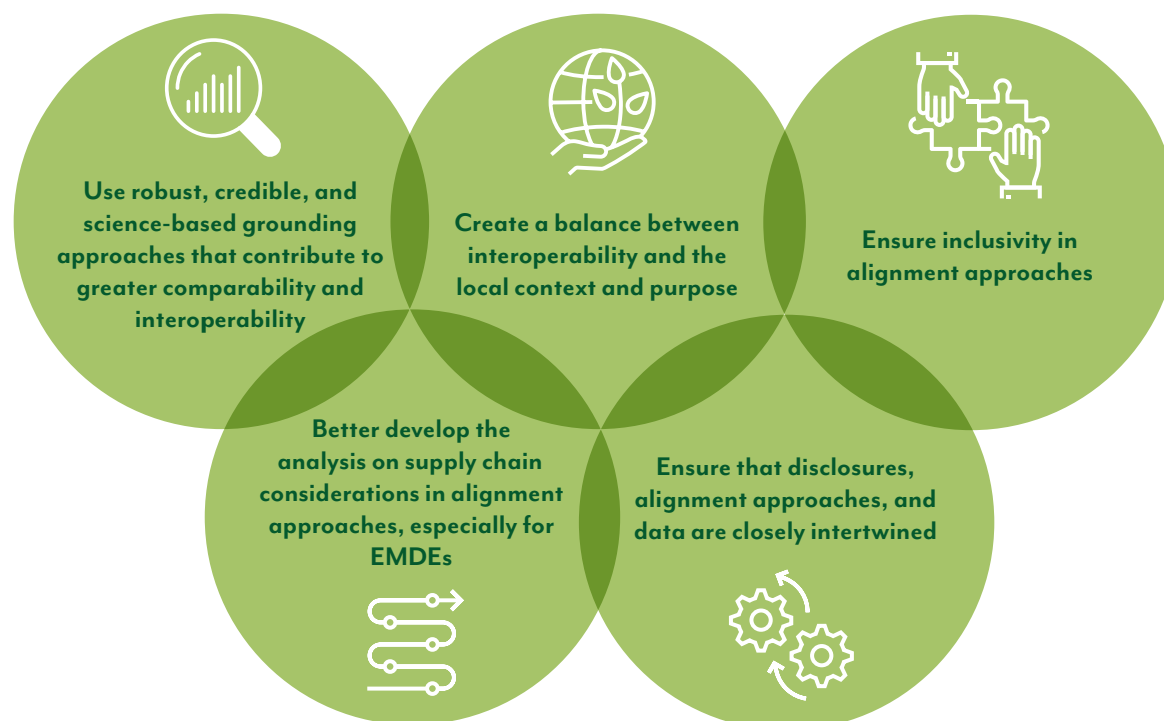
Fourth, by closely considering alignment issues related to supply chains, this report aims to (a) contribute to the credibility of net-zero corporate commitments (as GHG emissions in supply chains often cause climate and environmental impacts) (Coalition of Finance Ministers for Climate Action 2022), (b) participate in the scaling up of investments in funding for climate mitigation (and potentially adaptation) in climate-vulnerable countries and in hard-to-abate sectors, (c) improve SMEs' greenhouse gas profiles in EMDEs, and (d) accelerate the efficiency of advanced economies' alignment approaches. Specificities of supply and investment chains in EMDEs, including for energy-intensive and sophisticated EMDE-based entities, are critical to advanced economies' supply chains and ultimately mitigate supply chain price shocks.

Fifth, interoperability of alignment approaches is critical to the progress of international efforts on global and regional standards for sustainability disclosures and financial instruments. Global baselines can encourage better-quality data that are comparable and available across industries, markets, and countries, helping to pave the way for interoperable approaches. Meanwhile, disclosures following global baseline standards may contribute to global consistency of the underlying metrics used in alignment approaches. Where possible, standards should consider relevant information to be disclosed beyond a global baseline (OECD 2022c). See figure 3 for all the foundational elements.

⁷ At the 2019 UN Secretary-General's Climate Summit, MDBs reconfirmed in a joint statement their commitment to helping clients deliver on the goals of the Paris Agreement. To this aim, the MDBs developed an approach for aligning activities with the Paris Agreement goals consisting of six "building blocks": alignment with mitigation goals (BB1), adaptation and climate-resilient operations (BB2), accelerated contribution to the transition through climate finance (BB3), engagement and policy development support (BB4), reporting (BB5), and alignment of internal activities (BB6). Further details can be found at <https://thedocs.worldbank.org/en/doc/784141543806348331-0020022018/original/JointDeclarationMDBsAlignmentApproachtoParisAgreementCOP24Final.pdf>.

Comparable metrics offer the following advantages: They (a) give more credibility to claims of financial and nonfinancial market participants actually achieving climate, environmental, or other sustainability objectives; (b) are decision-useful when comparing financial and nonfinancial market participants with their peers, which then provides incentives for tracking progress and financing the transition; and (c) are actionable, by being based on the best available data (including decarbonization pathways and scenarios), drawing as much as possible on open source methodologies.

Figure 3: Foundations in implementing common principles for alignment approaches



Source: Original figure for this publication.

Note: EMDEs = emerging markets and developing economies.

Beyond the foundations, this report will also consider how development of a transition finance framework fits within the six Principles of the G-20 Roadmap because alignment approaches alone (even if in line with the Principles) will not be sufficient to deliver on sustainable finance promises and goals. A robust and widely applicable transition framework should be built on practical joint considerations and lessons for ensuring consistency with the G-20 SFWG Principles. These include the identification of transition-aligned investments, corporate and project-level reporting guidelines, impacts on the design of transition-finance-related financial instruments, and mitigation of other environmental and social impacts (including the aim of a just transition).

Operationalizing the Principles raises several challenges. To make considerable progress in operationalizing the Principles in the global context of a Paris Agreement–aligned investment environment, this report aims to provide clarity and practical options, noting the following challenges of designing a robust, low-carbon transition:

- **Bottom-up and top-down approaches.** As underlined in the G-20 SFWG 2022 report (G-20 SFWG 2022, 29), alignment approaches may vary widely, given that jurisdictions may have “specific policy priorities, capacities, market sophistication, regulatory framework, and use cases.” Operationalization of the Principles needs to consider and be inclusive of bottom-up approaches, such as GFANZ (2022), and top-down approaches, such as jurisdiction-led taxonomies that use alignment of minimum standards with international targets and regional and sectoral breakdowns (PRI 2020). These approaches include a variety of national or regional frameworks and laws, private sector–led tools and approaches, and tools and approaches developed by international organizations and market standard setters. Some government-led approaches focus on specific policy goals, such as internationally referenced climate-energy scenarios and nationally determined contributions (NDCs), to be incorporated into instrument or asset-level uses (Biorl 2021), while other bottom-up approaches are tailored more to the needs of market participants with a potentially positive effect on market development.
- **Use cases.** Tools and approaches can have a range of different use cases. Taxonomies, for example, provide a boundary and criteria- or threshold-based classification of qualified assets and/or sectors and activities, such as Colombia’s Green Taxonomy (Escobedo 2022). Labels and certifications, such as the EU’s “Ecolabel for Retail Financial Products,” can identify specific investments as sustainable. Indexes, alignment metrics, and portfolio tools may provide information on impact and performance measurement at an aggregate level (such as MSCI and Refinitiv). The options in this report cater to these different use cases. For example, taxonomies, specifically, may in some instances be used as climate risk management tools (in addition to their more conventional use for asset and portfolio alignment), though this requires a more holistic multi-asset/portfolio perspective and a transition-based approach. A handful of projects across the globe recognize the utility of taxonomies for both purposes, and this can lead to design challenges.

As emphasized in the G-20 SFWG 2022 report, use cases may also differ across jurisdictions, depending on the amount of technical expertise required; the degree to which credible, forward-looking mid- and long-term transition plans can be captured; institutional processes; related implementation costs (such as for SMEs); the desired flexibility to adjust and adapt to transition pathways as technology and supporting policy evolve; and the institutional ability to provide “a shared reference encouraging and supporting engagement between policy makers, investors and companies” (G-20 SFWG 2022, 29).

- **Level of granularity.** Approaches vary in terms of their level of detail and prescriptiveness. More detail arguably can provide a higher degree of clarity and consistency to prevent greenwashing and allows tailoring toward national (or regional) sustainability goals. Other approaches are more principles based, with an eye to allowing greater discretion and flexibility and potentially lowering the costs of auditing and certification, in particular for EMDE-based corporate entities. Operationalizing the Principles therefore requires a “middle lane” approach that finds the right balance between overly granular classifications and overly flexible ones, and at a minimum that offers a common language to determine the equivalence of specific features of alignment approaches and to facilitate their use and recognition across different jurisdictions (such as the ASEAN Taxonomy).

- **Level of application.** Approaches vary in terms of level of application; for example, taxonomies generally apply at an activity or underlying asset level. Labels can apply at the financial instrument level. Indexes or benchmarks can apply at the portfolio level. While science-based alignment measures (such as in taxonomies) and key financial instruments (such as green bonds) are mostly sector, activity, or project based, investors may find it more useful to receive clear signals about the sustainability performance of the entity as a whole (such as through transition plans), sometimes against the criteria or pathways of such classifications. The analysis considers this approach. Voluntary disclosure standards and disclosure regulations are entity based (that is, at the issuer or institution level). Both standards and regulations are arguably complementary in developing sustainability-related disclosures. For example, asset-level approaches (such as transition taxonomies built on sectoral decarbonization pathways) can inform disclosure requirements at the entity level, such as transition plans (OECD 2022b). Those approaches may then have an influence on portfolio-level methodologies, given that they are built on company-level aggregates. This would argue for an operationalization of principles that encompasses a broad range of levels of application, at asset, entity, and portfolio levels.
- **Backward-looking and forward-looking approaches.** A backward-looking approach can be based on disclosed data and a form of auditing, while a forward-looking view can provide valuable information about future trajectories and transition plans (based on extrapolated data, energy-climate scenarios, or decarbonization pathways). Further operationalizing the high-level Principles may require both backward- and forward-looking elements to consider transition plans and verify the progress made. This process could improve the credibility, accountability, and uptake of transition planning, because alignment approaches can inform the design (and reporting for accountability) of credible and comparable transition plans by investors or other firms upstream. Combining backward- and forward-looking approaches, such as with the Task Force on Climate-Related Financial Disclosures (TCFD) framework, could also be conducive to covering the whole-of-economy climate transition, including carbon-intensive sectors and EMDE-based issuers, where much of the potential for financing of decarbonization processes remains untapped.

This report therefore offers a practical approach to technical issues and options for the design and implementation of alignment approaches. It aims to help relevant public authorities as well as private organizations to develop sustainable finance alignment approaches or to enhance existing frameworks. It also helps to guide the private sector and to reduce the risk of fragmentation in capital markets. The approach adopted by this report leverages the joint knowledge of the authors' participating organizations, notably in terms of emerging application practices across advanced economies and EMDEs, and captures the currently emerging complexities at the front lines of developing alignment approaches.



C

Methodology

These high-level discussion points focus on climate-related issues—that is, supporting the temperature goals of the Paris Agreement and the outcomes of the Glasgow Climate Pact—which is a narrower approach than the abovementioned G-20 Roadmap’s focus on climate and sustainability. This narrower scope is needed to manage the analysis and application across financial markets while acknowledging that climate change mitigation goals remain the most urgent topic (noting that the rate of progress on climate mitigation is increasing the need to focus on adaptation, particularly for EMDEs). The negative impacts of climate change are indeed mounting, and rising GHG emissions “could soon outstrip the ability of many communities to adapt” (Tollefson 2022). Some fundamental aspects are applicable to other sustainability categories as well, such as adaptation to climate change, biodiversity and ecosystems, human rights, inclusion, and just transition issues. The report duly integrates them where they are material to designing approaches to align investments with the Paris Agreement goals. The following background work was undertaken:

- A **comparative analysis across all known existing and anticipated approaches** at the asset level. This analysis included a comparison of existing and forthcoming asset-level approaches, transition plan frameworks, and other entity- and portfolio-level approaches.
- A **literature review**, including documentation of key alignment approaches at the national, regional, and global levels.
- **Interviews** conducted with various public and private sector stakeholders.
- **Identification of technical issues encountered in applying the Principles.**
- **Development of answers for a set of more concrete questions for each Principle.**

With this information, the next steps were to (a) identify technical issues and apply them against each of the Principles, (b) develop suggestions to improve integration and compatibility of the Principles, and (c) provide suggestions to support the development of operational considerations and emerging lessons for each Principle. These elements are summarized in the synthesis and are detailed as part of a separate technical report for each Principle.

The structure of the review of each principle is as follows:

- **Operational issues.** This section identifies the issues regarding the relevant principles from the perspective of their design, disclosures, data, and interoperability. The objective is to lay out a series of key technical questions stemming from the analysis of the high-level principles and based on the author institutions' experience in supporting the design and implementation of alignment approaches as well as discussions among their participating organizations.
- **Key takeaways from the comparative and technical analysis.** This section showcases country-specific (or other types of) examples, as well as lessons from the literature based on the analyses undertaken.
- **Suggestions.** This part lays out options for comparability, convergence, and credibility across alignment approaches. It builds, to the extent possible, on existing analyses and recommendations from participating organizations and external stakeholders, as well as on novel work performed around alignment approaches.

Notably, several of the high-level principles are highly interdependent, especially as discussed in the following:

- **Principle 1: material positive contributions to sustainability goals, and Principle 5: science basis for environmental goals.** The interdependence is due to credibility, implementation, and usefulness considerations of sustainable finance classifications. A science basis for a climate objective under Principle 5 is a prerequisite for making any contribution to a climate-focused sustainability goal.
- **Principle 3: be dynamic to reflect policy, technology, and state of the transition changes, and Principle 6: address transition considerations.** The dynamism can be contemplated from a transition timing perspective—that is, scientific, technical, and technological changes; regulatory considerations; demand evolutions; market changes; and adjustments to ensure inclusion of all parts of the economy—and a criteria-setting perspective, such as decarbonization pathways.

The report recognizes that one size does not fit all, and reconciling the goal of having sufficient ambition and aligning with the Paris Agreement requires inclusivity and flexibility for financial market participants, including SMEs in EMDEs. While the findings of the report support the setting of targets, the report also allows for different pathways and sufficient flexibility with tiered options.

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A landscape of rolling green hills under a bright sky. The foreground is a lush green field with visible rows of crops. The hills in the background are covered in green grass and extend towards a horizon line. The sky is a pale, clear blue with some light clouds.

SYNTHESIS BY PRINCIPLE

**Critical Considerations
and Emerging Lessons
in Applying Principles for
Alignment Approaches**



PRINCIPLE

1

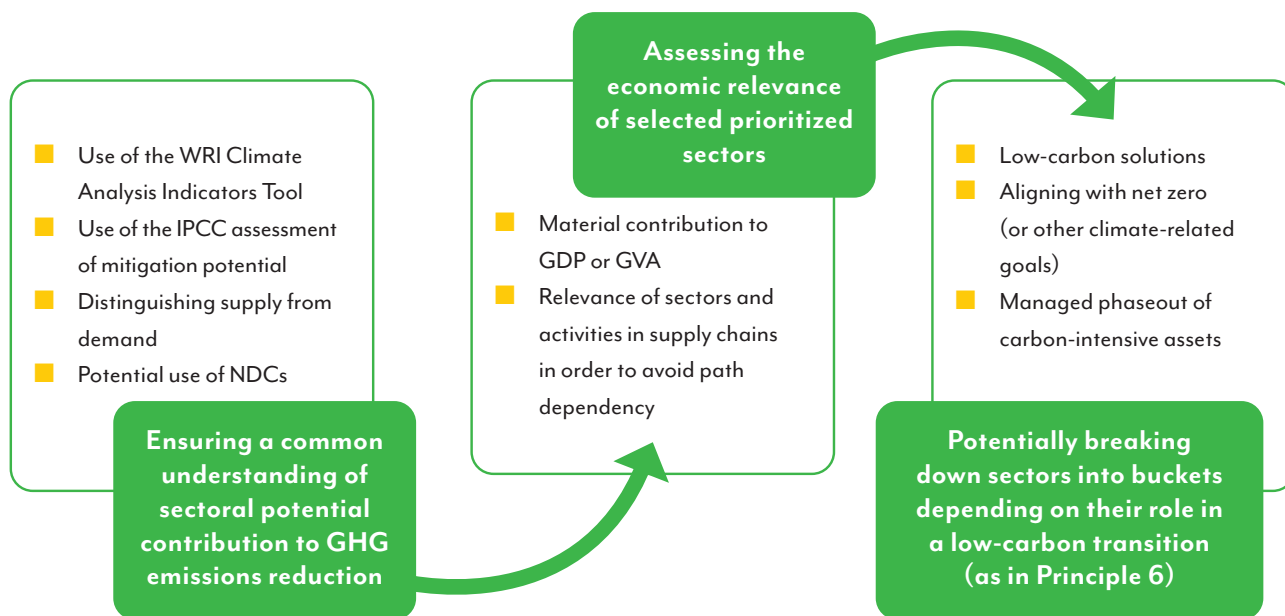
Aims to ensure that alignment approaches bring material positive contributions to sustainability goals and focus on outcomes.

This report focuses on how this principle applies to climate change mitigation as a primary objective, to ensure material real-world decarbonization outcomes. Designing an alignment approach according to this principle raises a variety of methodological challenges, including (a) formalizing the scope of the objectives, (b) defining climate change mitigation and how it affects criteria setting, and (c) developing the methodology to define screening criteria (principles based or outcome based) and assess alignment. Existing approaches have mostly focused on climate change mitigation as a primary objective, with diverse methodologies in sectoral coverage choices and assessment of what constitutes a substantial contribution. In this context, the report highlights that the application of Principle 1 may be based on the following foundations:

- **A common and science-based definition of a climate change mitigation objective.**
- **A common process to set climate or environmental objectives**, in line with a climate-related ambition defined beforehand and tailored to financing needs at the regional, national, or sectoral level—especially for emerging markets and developing economies (EMDEs) and low-income countries. On this basis, consideration can be given to (a) financing gaps for the objectives and (b) vulnerabilities and current barriers to achieving those objectives. This process ensures that the alignment approaches can support transparency, assessment, and financing. Alignment approaches may also consider multiple objectives, which can be developed in phases, considering the interactions—and potential trade-offs—between climate and environmental goals (or other sustainability goals), as well as the feasibility of the application of a “do no significant harm” (DNSH) approach to these objectives (see Principle 2).

- Sectoral prioritization, which is a crucial step in the design of an alignment approach, primarily at the asset and entity levels and most particularly for climate change mitigation goals.** Three key principles may be applied: (a) a broad coverage of sectors looking at a system level; (b) clear-cut terminology use, distinguishing between economic sectors, activities, industrial processes, and technologies; and (c) a distinction in setting criteria or decarbonization pathways (or both) between sectors with high decarbonization pathways and those with a potential to enable decarbonization (for example, information technology for efficient grid operations). Given the carbon-intensive nature of economies, alignment approaches need to promote a substantial contribution to climate-related goals by scaling up zero-carbon alternatives to high-emitting activities, especially those in hard-to-abate sectors, as a prerequisite to phasing out high-emitting assets. A three-step methodology (figure 4) can be considered for sectoral identification and prioritization based on (a) decarbonization potential, (b) economic relevance of the activity to a country or region, and (c) a “three-bucket” approach in the assessment of the sectors’ contribution to decarbonization goals—namely, low-carbon solutions, alignment with the Paris Agreement temperature goals, and managed phaseout. The report also includes emerging lessons in translating carbon budgets into benchmarks as part of portfolio-level alignment approaches.
- A common approach to assess greenhouse gas (GHG) emissions and perform life cycle analysis,** particularly given the data-related challenges such as Scope 3 and value chain GHG emissions data, lack of avoided emissions data, inconsistency of data across providers, and limited data for micro, small, and medium enterprises (MSMEs). Climate performance metrics should also factor in different temporal perspectives, with policy milestones preferred to allow for consistency, comparability, and tracking.

Figure 4: A three-step approach to assess substantial contribution

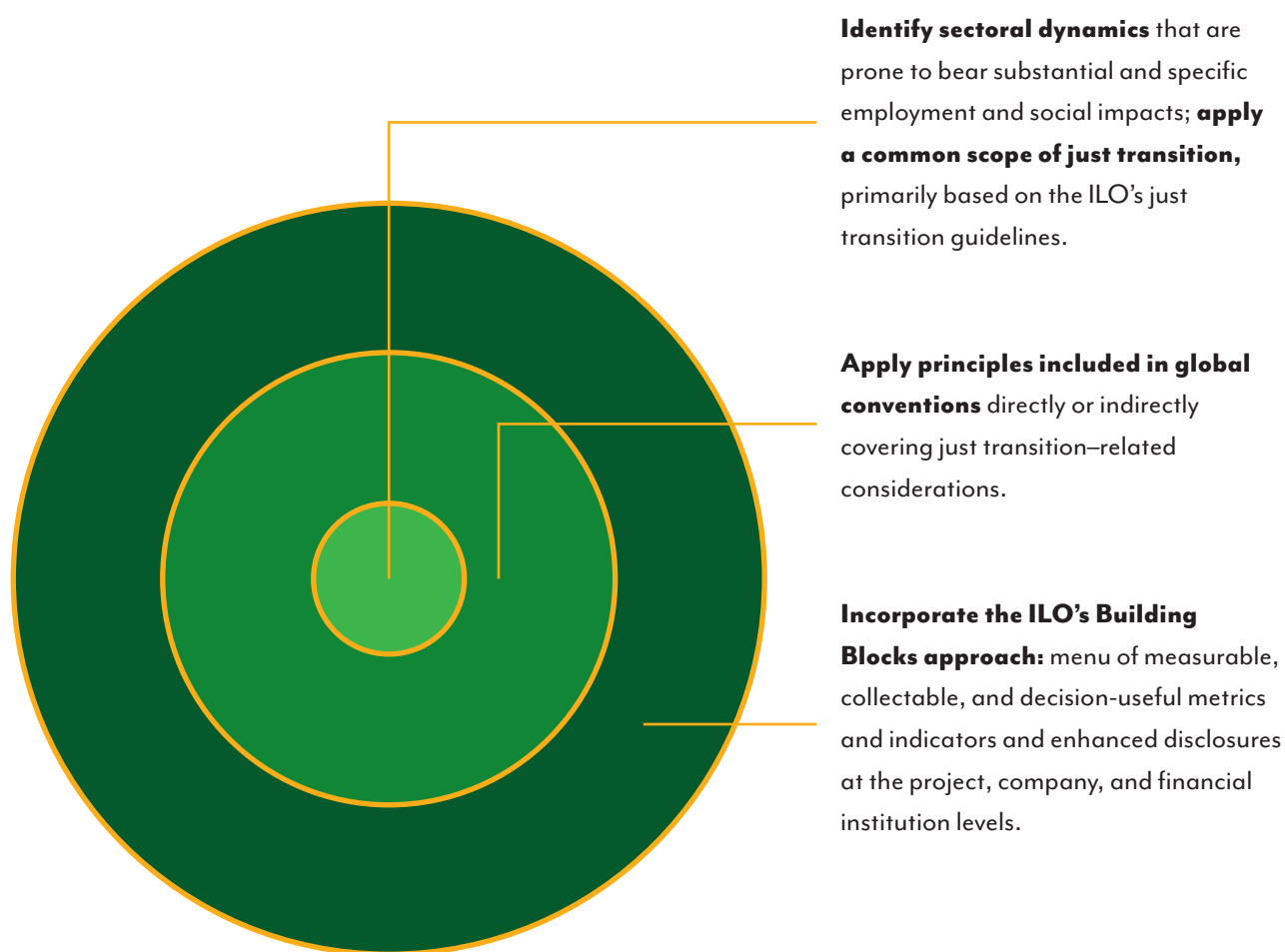


Source: Original figure for this publication.

Note: GDP = gross domestic product; GHG = greenhouse gas; GVA = gross value added; IPCC = Intergovernmental Panel on Climate Change; NDCs = nationally determined contributions; WRI = World Resources Institute.

- **Principles-based observations to address just transition considerations**, as part of the assessment of a substantial contribution to climate-related objectives and the integration of transition considerations (Shipper et al. 2022). The report lays out a series of options, summarized in figure 5.⁸ The International Labour Organization (ILO) defines a “just transition” as one that maximizes the social and economic opportunities of climate action, while minimizing and carefully managing any challenges (such as employment impacts of the low-carbon transition in hard-to-abate sectors, socioeconomic impacts of the phasing out of coal at the subnational level because of structural dependencies on the coal-producing industry, and so on)—including through effective social dialogue among all affected groups and respect for fundamental labor principles and rights.

Figure 5: Ways to address just transition considerations in alignment approaches



Source: Original figure for this publication.
 Note: ILO = International Labour Organization.

8 Originally defined by the International Labour Organization, the most recent statement of the 2022 United Nations Climate Change Conference (COP27), November 2022, noted that a “just and equitable transition encompasses pathways that include energy, socioeconomic, workforce and other dimensions, all of which must be based on nationally defined development priorities and include social protection so as to mitigate potential impacts associated with the transition” (UNFCCC 2022, 6).

- **A dual and complementary solution to seeking consistency across asset-level alignment approaches from a statistical point of view.** This solution consists of (a) the use of the same industrial classification system across all approaches—or, at a minimum, the connection to the same industrial classification system for those asset-level alignment approaches that have already been adopted—and (b) mapping between International Standard of Industrial Classification (ISIC) codes and other regional or national statistical classification codes to ease international assessment.



PRINCIPLE

2

Aims to avoid negative contribution to other sustainability goals (for example, through requirements to do no significant harm to any sustainability goal).

This Principle emphasizes that alignment approaches need to be underpinned by a foundation of environmental, social, and governance (ESG) risk management to avoid negative contributions to other sustainability goals. A robust ESG due diligence and risk management approach contributes to financial stability by reducing investment risk, prevents greenwashing, and prevents unintended or secondary negative impacts on society and the environment. For example, in an asset-based alignment approach, a project that increases water availability should avoid significant harm to climate change goals (for example, from additional GHG emissions) or ensure compliance with certain social safeguards (for example, avoiding human rights abuses).

Operational design issues include defining “significant harm.” Considerations include the following:

- How is material and significant risk defined?
- What are the thresholds that trigger further assessment and mitigation?
- Is harm identified at the activity level or at a company level?
- How far into subsidiaries and supply chains should harm be assessed?
- What level of mitigation will bring the activity into alignment?

From a data and disclosure perspective, questions arise regarding when an assessment should be undertaken and how often, because harm may emerge over time; what external assurance could be given to ensure the assessment is credible; and how to ensure that broader ESG risk management is embedded in an entity from a good governance perspective.

Several taxonomies have adopted both a “do no significant harm” (DNSH) criterion and a minimum social safeguard (MSS) screening criterion. Other taxonomies rely on adherence to national environmental and social regulations and laws. Green bond disclosure frameworks may also require disclosure of social and environmental risks and the processes in place for mitigation. ICMA’s Green Bond Principles call on issuers to clearly communicate to investors about how they identify and manage perceived social and environmental risks associated with the relevant project(s); and encourage issuers to have a process in place to identify mitigants, including clear and relevant trade-off analysis.

Emerging lessons suggest that rather than inventing new methodologies to demonstrate avoidance of significant harm, to the extent possible existing standards and frameworks can underpin DNSH and MSS criteria. Doing so can allow existing systems and data sources to be employed.

Thus, a **two-tiered approach for implementing Principle 2** could be based on shared minimum ground and options for improvement.

At a minimum, the framework could ensure compliance with the following:

- **National environmental and social regulations and laws** applicable to the sector, location, and activity.
- **Relevant international conventions to which the jurisdiction is a signatory**, such as conventions on labor and human rights (such as the ILO Declaration on Fundamental Principles and Rights at Work and the International Bill of Human Rights) and those that are directly related to the preservation of the environment (for example, the Convention on Biological Diversity, the Montreal Protocol on Substances That Deplete the Ozone Layer, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, the Stockholm Convention on Persistent Organic Pollutants, and other international conventions). Explicit reference to conventions in alignment approaches may facilitate interoperability and international investor due diligence.

The approach can also propose the following:

- **A well-defined risk management approach** (such as an environmental and social risk management standard or a due diligence and monitoring approach)—for example, the International Finance Corporation (IFC) Performance Standards⁹ or those adapted from those standards, such as the OECD Common Approaches or the Equator Principles, as well as the impending disclosure standard being prepared by the International Sustainability Standards Board for managing material sustainability risks and opportunities.¹⁰
- **An indicative set of environmental and social performance topics**, such as those reflecting global consensus demonstrated by ESG risk management standards, sustainability disclosure good practice, and the Sustainable Development Goals (SDGs)

9 IFC’s ESG Standards comprise the Performance Standards, which define clients’ responsibilities for managing their environmental and social risks, and the Corporate Governance Methodology, which sets out an approach to evaluate and improve the corporate governance of clients (IFC 2012). See also the IFC Corporate Governance Methodology, 2023, <https://www.ifc.org/content/dam/ifc/doc/2023/ifc-corporate-governance-methodology.pdf>.

10 Joint research by the IFC and the Equator Principles Association (June 2023) has explored the linkages between the IFC Performance Standards (PSs) and World Bank Environmental, Health, and Safety (EHS) Guidelines, and the DNSH and minimum safeguards criteria set by the European Union’s Taxonomy for Sustainable Activities. The research concluded that the PSs and EHS Guidelines approach to environmental and social risk management is entirely compatible with the EU Taxonomy’s DNSH and Minimum Safeguards (MS) requirements.

The implementation of a broader Responsible Business Conduct (RBC) due diligence framework should provide an anchor framework to cover supply chains beyond companies' own operations. An RBC due diligence framework sets an expectation that businesses (including investors) will avoid and address adverse impacts of their operations (or economic activities), including when they occur in their supply chains and business relationships. The Organisation for Economic Co-operation and Development (OECD) “Guidelines for Multinational Enterprises on Responsible Business Conduct” (MNE Guidelines; 2023) are recommendations addressed by governments and aimed at multinational enterprises operating in or from adhering countries. These guidelines are the only multilaterally agreed on and comprehensive code of responsible business conduct that governments have committed to promoting. They adopt a risk-based approach to identify, prevent, mitigate, and account for how they address these actual and potential adverse impacts in their own operations, their supply chains, and other business relationships. The approach can be particularly relevant in the context of assessing the contribution of business and the financial sector to GHG emissions and reductions of those emissions, both from corporate operations and across the supply chain. The MNE Guidelines were updated to reflect and clarify expectations. They are now the first government-backed recommendations for businesses (including financial service providers) on how to align with global temperature goals. The Environment chapter sets out the expectations that enterprises conduct due diligence to assess and address adverse environmental impacts associated with their operations, products, and services, and their business relationships, including in relation to climate change, biodiversity, and human rights.

Figure 6: Method to assess the “do no significant harm” principle in alignment approaches



Source: Original figure for this publication.

Notes: IFC = International Finance Corporation; OECD = Organisation for Economic Co-operation and Development.



PRINCIPLE

3

Aims to ensure that alignment approaches are dynamic, reflecting changes in policies, technologies, and the state of the transition.

Approaches for alignment would be most effective if they reflected (a) scientific, technological, and market changes and (b) the evolution of both domestic and international policy agendas and priorities, yet examples of these are disparate and relatively scarce.

In addition, a few asset-level alignment approaches have evolved their criteria for those activities that are highly carbon intensive. Dynamism also involves adapting over time with improvements in the availability and quality of data and metrics, and it encompasses the changing nature of the transition and achievement of targets. Such dynamic adjustments may take the form of changing coverage (for example, sectoral coverage) and technical standards. The application of Principle 3 may be based on the following foundations:

- **Alignment approaches should be reviewed and updated** periodically to capture changing expectations, as countries and industries move forward in decarbonization over time and while transition pathways across emerging markets and developing economies progressively converge. This is particularly important for high-priority sectors for decarbonization that would be more prone to such evolutions and as alignment approaches ultimately aim to mobilize capital for research, development, and innovation of alternative low-carbon technologies and solutions (for example, technological and economic breakthroughs in green steel or cement production).

- **An alignment approach may detail the specific conditions under which approaches would evolve and the governance arrangements that are in place to implement new developments.** Such details may include implementing permanent governance committees to address the challenges of implementation and updating the sectors, activities, and criteria, all of which will require resources and time for public entities. Governance committees need clear mandates and delegated responsibilities; a process to conduct stakeholder engagement every n years; a process to ensure continuous capacity building of stakeholders; and the design and implementation of measurement, reporting, and verification systems and mechanisms. For example, entities using transition plans as part of Principle 6 may need to consider the transition of carbon-intensive assets, activities, and sectors in line with scientific and technological developments and, therefore, regularly review and update their plans.
- **Disclosures in transition plans must regularly evolve and make direct references to the time span in which they operate.** This information is crucial given that transition requirements will progressively become more stringent as low-carbon targets approach and something is needed to motivate the adoption of scientific and technological developments.
- **An inclusive approach may be developed for the treatment of green and sustainability-aligned bond instruments**—without undermining the ambition of alignment approaches—by integrating the concept of equivalent information into the framework where there is an absence of reported information. The use of equivalent information may integrate the concept of grandfathering to committed (or allocated) proceeds of green and other types of sustainability financial instruments—for example, financing fixed assets, capex (capital expenditures), opex (operating expenses), sovereign expenditures, equity, and debt.



PRINCIPLE

4

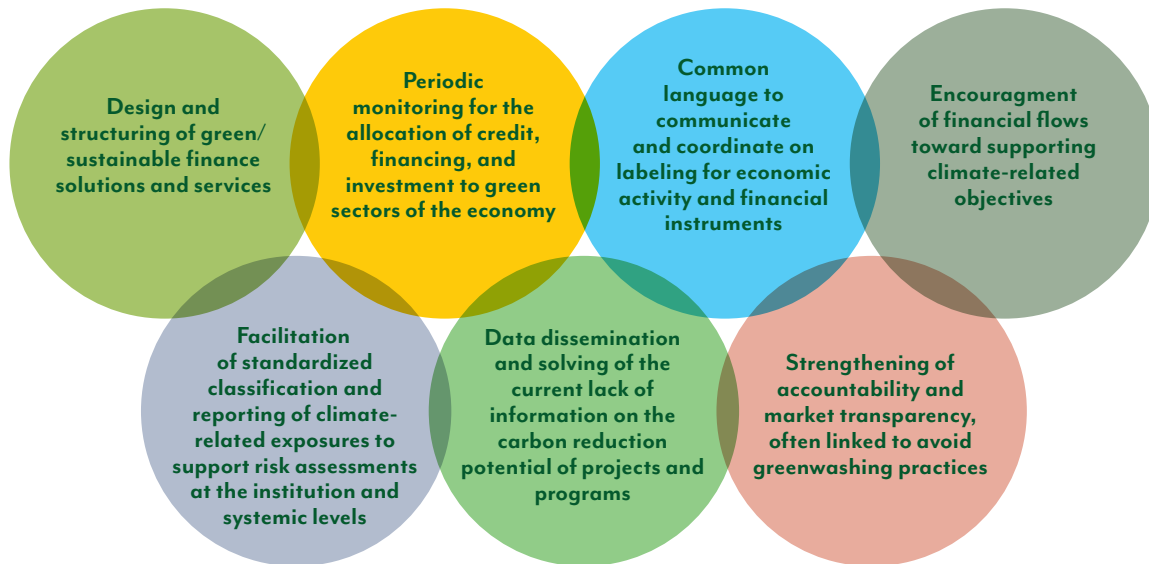
Aims to ensure that alignment approaches reflect good governance and transparency.

Good governance and transparency are critical during both the development and maintenance stages of alignment approaches. Essential elements include the following:

- **Clear ownership and leadership** by appropriate institutions in the market, which may include a mix of government agencies and private sector entities or associations
- **Clarity of the purpose** of the alignment approach, how it will be implemented, and what claims can be made
- **Clear guidance** on disclosure of performance and outcomes
- **Representation of relevant voices** during stakeholder consultation and in ongoing oversight structures
- **Transparent communication** to interested and affected parties on governance and implementation matters
- **A process to respond to stakeholder grievances** to ensure accountability and responsiveness to market realities
- **A commitment to review and respond** to emerging information on the effectiveness of the alignment approach
- **A commitment to promote ease of use and broad applicability** through interoperability and the use of common international approaches

Figure 7 provides objectives for existing alignment approaches and illustrates how they overlap.

Figure 7: A variety of objectives for existing alignment approaches



Source: Original figure for this publication.

Strong governance standards can help overcome a range of disclosure and information challenges in the design and successful implementation of alignment approaches. However, there are common disclosure dilemmas in relation to alignment approaches, including the following:

- **Quality of information available to investors.** Market failures from insufficient disclosure practices in traditional capital markets can lead to reduced funding flows and higher funding costs. Sustainable finance may be marred by similar market failures and may operate in a more complex and less developed data environment than conventional finance. Through improving information quality, governance frameworks can help steer investors toward objectives that are consistent with the preferences and policy objectives of sustainability and the impact aspirations of their clients. Information produced by financial market participants can also help set the appropriate price for externalities (such as carbon taxes), thus enhancing the sustainability of economic activities.
- **Minimum disclosure requirements that distinguish between entity-level reporting and activity- or sector-level reporting while recognizing the linkages between the two.** An asset-level approach that ignores entity-based information altogether is prone to greenwashing risks (such as misleading labeling) because a company or an issuer that can label part of its activities or project as green should not necessarily be considered green or sustainable as an entity. Although much of the sustainable finance market—particularly in relation to green bonds—has focused on verifying green, low-carbon, or sustainable activities, asset-level alignment approaches are progressively incorporating entity-based information, which allows for leveraging the entity’s overall approach to managing ESG risk as well as its transition commitment and plan.

- **Addressing the needs of diverse users of information.** Sustainable finance is of interest to a broader set of stakeholders than just investors in a company's equity or debt securities. Given the need to account for the externalities that a firm imposes on the environment in which it operates, a common view is that disseminated information should be material to both investors and other stakeholders (double materiality), and the adoption of double-materiality standards could improve the quality and comparability of the information provided. It also serves to manage stakeholder relationships, which in turn reduces risk and has been linked to other business benefits, including financial outperformance (Eccles, Ioannou, and Serafeim 2014).
- **Managing data complexity.** Sustainability-related data needs are inherently higher than those in conventional finance, particularly for sustainability-linked bonds, where specific performance metrics are tracked, and transition finance, for which companies need to disclose progress on their specific transition plans and milestones. (In particular, this is the case for sustainability-linked bonds, where use of proceeds is not tracked.) For example, investors in thematic bonds, as opposed to "vanilla" bonds, will demand additional data on the use of proceeds or key performance indicators as well as ongoing data updates to track progress toward promised results. Alignment approaches can help identify core elements of, and metrics for, environmental impact and thus contribute to the improvement of the effectiveness of disclosure and data availability, as well as harmonization of scoring methodologies.
- **Ensuring consistent and transparent use of climate-related metrics.** Metrics used by third parties (such as index providers and transition finance framework providers, including authorities and industry bodies) should support the global comparison of climate-related risks and opportunities as well as the achievement of climate objectives for those financial market participants committed to those objectives. Methodological elements should be transparent to support the quality of climate-related metrics. Where chosen metrics align with existing indicators used in disclosure frameworks, alignment approaches can leverage existing frameworks and contribute to common data usage.
- **Accommodating different disclosure requirements, which recognize that small and medium enterprises (SMEs) in all economies and firms in EMDEs typically have fewer resources to comply with onerous disclosure requirements.** Different disclosure regimes for such firms could solve the issues of limited availability of assurance services in EMDE markets and compliance costs for SMEs that may be excessive relative to their size, and the lower risks they present. They could also address broader concerns about these firms' ability to acquire and process complex data. Less data should be expected from companies further down the supply chain (because of the associated costs); therefore, one strategy is to prioritize key metrics, such as GHG Scope 1 and Scope 2, which can inform Scope 3 disclosure by larger entities that are either buyers from or investors in the SME. In this way, disclosure regimes for SMEs can focus on strengthening their ability to secure contracts with buyers along supply chains and to gain access to finance from banks because of their climate and ESG credentials.
- **Increasing credibility through external review.** Use of assurance and verification has implications for the costs of adopting alignment approaches and can therefore be perceived as a market barrier. Use of assurance and verification also requires that regulators consider the availability of local service providers and provide guidance on suitable standards of practice, such as whether assurance providers must be certified according to local or international standards. There are other options that may add more value for SMEs, such as getting certified in line with specific labels or programs or International Organization for Standardization (ISO)-type standards. Assurance will generally focus on the systems that underpin ESG performance. If verification of GHG Scopes 1, 2, and 3 is the main goal, then audit, assurance, and verification can be limited to that topic.

To promote quality, consistency, and reliability in sustainable finance alignment approaches, policy makers, financial authorities, and central banks—within their mandates—can therefore consider the following:

- **Supporting the consistent and transparent use of climate-related metrics** to foster greater quality and comparability across jurisdictions and industries
- **Gradually working toward mandatory disclosure requirements** to reduce market uncertainty and promote the availability and use of reliable, comparable, and high-quality data
- **Disclosing entity-level as well as activity-level information** to prevent greenwashing and assess companies' broader alignment to national, regional, or global industry-specific climate-related targets
- **Encouraging disclosure of forward-looking information**, including interim targets and transition plans
- **Ensuring effective, high-quality external review**
- **Providing clear and proportional guidance** to support the scope, format, and frequency of information (including forward-looking information) to be disclosed



PRINCIPLE

5

Aims to ensure that alignment approaches are science based for environmental goals and science or evidence based for other sustainability issues.

The best available science and technologies should drive the definitions of metrics, thresholds, and technical screening and assessment criteria in alignment approaches. Where science-based metrics are not feasible, approaches adopted should be fact based and ideally subject to verification.

Several design challenges arise in applying this principle: (a) choosing the science-based driver, whether normative or scientific (such as national development priorities, SDGs, Paris Agreement temperature goals) and (b) defining a scientific baseline and ensuring it is incorporated into the criteria setting (such as choices regarding Scope 3 coverage, life cycle analysis, or inclusion of negative emissions from carbon capture).

Embedding the approach in science has significant consequences in terms of sectoral coverage, revision of the criteria over time to reflect evolving scientific and technical developments, and application of a transition-based approach.

It also leads to key consequences in terms of disclosures and data. Because of the technical nature of the metrics, data points, underlying methodologies, and overall reporting, data need to be verifiable. Any system of external assurance needs to be practical, and the choice of accounting standards to inform reporting under science-based criteria is significant.

Interoperability issues arise because of differences in quality, comparability, and reliability of data (specifically physical data) across economies, where significant data gaps exist. Different starting points and objectives in achieving climate-related objectives lead to differences in implementation of these alignment approaches, including from a science-based perspective.

Alignment approaches should aim to be objective in nature, supported by clearly defined and disclosed metrics, thresholds, or technical screening and assessment criteria that align with the best available science and technologies, where appropriate, and should be internationally interoperable.

When science-based metrics are not feasible, the approaches adopted should be fact based and subject to verification. Designers of the approach can lay out the rationale behind the design of the alignment approach and the advantages and disadvantages of the different science-based drivers of alignment approaches, such as nationally determined contributions (NDCs), sectoral road maps or decarbonization pathways, localization of global scenarios at the regional or national level, and use of national regulations.



PRINCIPLE

6

Aims to address transition considerations.

Alignment approaches should consider how to support a credible and just transition to a low-emission and climate-resilient economy. "Transition" means the fundamental interim process by which financial market participants, including nonfinancial companies, must transform their business model and their activities to substantially decarbonize; to ensure their environmental, social, and financial resilience; and therefore to adapt to a (warming) world under tight GHG emissions constraints.

As a result, transition is a forward-looking concept, meaning that it applies time-bound decarbonization pathways to reach net-zero goals, temperature alignment, or other environmental objectives. **It is also a holistic concept,** meaning that it has to be applied at the entity level.

Addressing transition considerations is a challenging exercise, given the unintended consequences it may entail—involving carbon lock-in, low-integrity investments, greenwashing risks, and rebound effects, if solely based on reducing emissions intensity rather than on absolute emissions (Creed and Horsfield 2021). Forward-looking information is indeed particularly exposed to greenwashing risks, owing to its reliance on projections. In this context, ensuring that alignment methodologies fully address transition considerations and capture transition dynamics includes elements such as the identification of transitional assets; the design of credible transition pathways; the implementation of relevant disclosures, including transition plans; and the rollout of verification requirements. Therefore, enhancing the robustness of a transition finance framework also aims to ease the mismatch between increasing demand for sustainable finance products and limited already low-carbon investment opportunities, thus helping to address greenwashing and contributing to a credible definition of a transition-aligned investment (ESMA 2023).

For asset-level alignment approaches, primarily in the form of taxonomies, there are three main approaches to transition:

- **A transition whitelist approach.** This approach includes activities with a positive climate impact that do not require any thresholds (for example, solar energy generation) and activities with benefits for climate mitigation purposes (for example, carbon capture, utilization, and storage [CCUS] for coal; reduction of methane leakage in pipelines).
- **A “dynamic pathway” approach** from significant harm to significant contribution, using a traffic-light approach. Amber activities are those that (a) move toward a low-carbon pathway but are not currently zero emissions, (b) face decarbonization barriers because alternatives do not exist, and (c) adopt interim solutions that reduce GHGs (for example, carbon capture and storage in a gas plant).
- **Remedial efforts to transition.** These efforts, though still causing some harm, do not involve further carbon lock-in.

Notably, just transition considerations are currently not embedded in these approaches.

The application of Principle 6 may involve the following:

- **Detailing options to effectively embed supply chain criteria and targets in transition plans.** Decarbonization criteria may be focused on the most efficient abatement levers, including circularity, process and material efficiency, use of renewable power, and nature-based solutions with advantages that may differ among sectors and geographical areas.
- **Underscoring to what extent and how entity-level reporting is key**, especially if associated with sectoral pathways and if based on a full GHG scope reporting criterion, to encompass the entire value chain.
- **Providing environmental and financial credibility to corporate climate transition plans so that they can have a measurable impact on the real economy and support climate alignment frameworks at the financial sector level.** In this context, entity-level alignment approaches can address transition considerations in a science-based manner through consideration of seven pillars, as circle the core in figure 8.
- **Connections with asset-level and portfolio-level alignment approaches.** These connections are varied and often important across these seven pillars. Such connections are all the more important because of the increasing investor focus on alignment approaches’ impacts on real economy decarbonization.

Figure 8: Pillars to transition-related considerations in alignment approaches at the entity level



Source: Original figure for this publication.

- **In transition planning, accounting for the particular circumstances of MSMEs and certain companies in EMDEs.** While the recommendations in principle apply to all companies and jurisdictions, the particular challenges of MSMEs and certain EMDEs need to be accounted for. This is because corporate transition strategies and plans should be in line with the global temperature goals of the Paris Agreement and, as a result, carbon-intensive lock-in must be avoided. MSMEs and some EMDEs have fewer resources available to comply with onerous disclosure requirements. Consequently, their focus can be on aligning their operations to keep their position in global supply chains or on structuring their operations to benefit from (for example) domestic preferential financing opportunities in support of a transition. In addition, MSMEs play a key role in the deployment of low-carbon innovation and employment and in promoting social cohesion.

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The background of the entire page is a photograph of a vast, rolling landscape of green hills. The hills are covered in lush green grass and stretch out towards a distant horizon under a clear, bright sky. The lighting suggests a sunny day, with the grass appearing vibrant and well-lit.

ACTIVATING ALIGNMENT

**Applying the G-20
Principles for
Sustainable Finance
Alignment with a Focus
on Climate Change
Mitigation**

**Technical Report,
by Principle**



PRINCIPLE

1

Ensure material positive contributions to sustainability goals and focus on outcomes.

A. Operational Challenges

B. Key Takeaways from Technical and Comparative Analysis

C. Methodological Suggestions to Apply the Principle

Approaches to align investments with sustainability goals should aim to create a positive contribution to existing and recognized international sustainability goals. Approaches can be focused on specific frameworks, such as the Paris Agreement and Sustainable Development Goals (SDGs), or themes such as climate, biodiversity, the environment, or other social objectives. Such contributions should lead to material outcomes. There is clear consensus on this principle in the market and among public stakeholders in various jurisdictions, and it is included as a key design principle in most approaches.

A. OPERATIONAL CHALLENGES

Design of the Sustainable Finance Alignment Approach

- **Formalizing the thematic scope of objectives** such as climate, “green,” or broader sustainability objectives as well as the difficulties in integrating socioeconomic considerations to such objectives. Defining the materiality of the positive contribution is a major technical challenge (that is, defining materiality in sustainability-related disclosures and in accounting principles, the link with the environmental materiality concept, and the interpretation of the term “substantial” in various taxonomies).¹
- **Defining “climate performance”** where the objective is climate related (climate change mitigation, in particular). Defining “climate performance” remains a complex issue in terms of the measurement of greenhouse gas (GHG) emissions, which is the strategic driver of the alignment approach that is ultimately preferred (for example, achieving GHG neutrality, with a role for technological and natural carbon sequestration) compared with goals expressed in the Glasgow Climate Pact, or commitments regarding the Paris Agreement temperature limits. Where climate also includes adaptation and other broader objectives, defining material positive contributions becomes more complex and qualitative.
- **Defining key contribution-related characteristics of the alignment approach.** An additional imperative is to define these characteristics, especially regarding (a) the alignment approach’s general method in defining criteria (that is, principle based, outcome based, or both); (b) the level of granularity and sectoral coverage; and (c) the methodology for alignment assessment (that is, performance threshold, activity- or asset-level criteria, impact-based analysis). Depending on the definition of “substantial,” several categories of sectors or assets might or might not meet the requirements—that is, “direct” material contribution, “indirect” material contribution (for example, enabling sector, activity, or both), or “transitional” contribution.
- **Addressing additional questions regarding setting criteria.** When focusing on the objective of mitigating GHG emissions, additional questions arise on the type of entry points that may be guiding criteria setting. These may include whether to draw on global-energy climate scenarios, regional and/or national transition plans, or nationally determined contributions (NDCs). Methods for choosing which priority sectors to cover also vary. Whether Scope 3 GHG emissions should be included, whether carbon offsetting can count as a contribution to a climate-mitigation goal, and whether a life cycle analysis approach should be adopted are also relevant to criteria setting.

Disclosures and Data in relation to Principle 4

- **Defining key minimal disclosures on data points, underlying methodologies, and results.** For climate-related objectives, the alignment approach needs robust and relevant disclosures to ensure they remain science based. Some approaches may consider “comply or explain” approaches in specific contexts—that is, emerging markets and developing economies (EMDEs) or small and medium enterprises (SMEs) for non-climate-related objectives. Clear, practical, and proportional guidance should be developed to support the scope, format, and frequency of information of these disclosures.

¹ For broader information on the concept of materiality and its implications for monetary and financial policies, refer to Boissinot et al. (2022).

B. KEY TAKEAWAYS FROM TECHNICAL AND COMPARATIVE ANALYSIS

The comparative analysis (summarized in figure 9) shows that

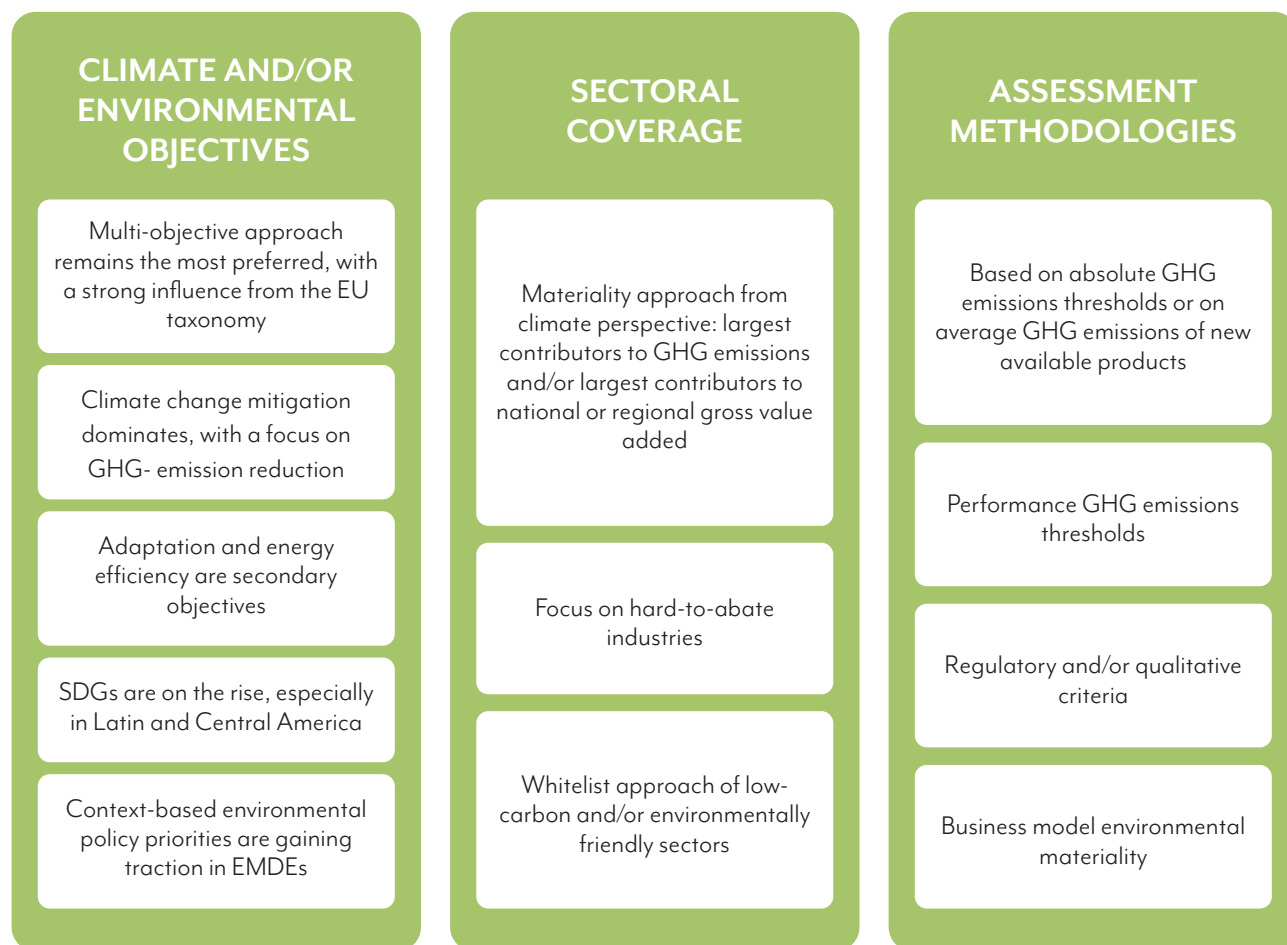
- **Climate change mitigation is typically an objective**, and it is a core objective in some areas—the European Union (EU), the Association of Southeast Asian Nations (ASEAN), and South Africa, for example. However, those designing alignment approaches across the globe prefer a multi-objective approach, which is governed by overarching goals, such as sustainability, resilience, or other goals mentioned in the UN Sustainable Development Goals. Only a select number of taxonomies are based on a common definition of GHG neutrality, and few frameworks emphasize the development of nature-based solutions, which have wider benefits for enhancing carbon sinks. A few countries directly relate objective setting to their particular national and context-based environmental policy priorities (for example, reducing air pollution in the Russian Federation, protecting biodiversity and focusing on land use in Colombia, improving livelihoods in Mongolia and Indonesia, and improving resource resilience in Singapore).
- **Decoupling economic growth from resource use and environmental impacts** is a primary objective for the taxonomy in the ASEAN region (and some jurisdiction-specific frameworks developed within that region). Currently, only a few projects, such as those in Mongolia, identify specific nonenvironmental social objectives. However, there is an emerging practice wherein social considerations are adopted through minimum social safeguards provisions (for example, laws that relate to local labor, bribery, taxation, and human rights). This is discussed in further detail in Principle 2.
- **There are three main approaches in terms of sectoral coverage** that identify key sectors and activities within those sectors to achieve climate change mitigation objectives. These three approaches are (a) the materiality of GHG emission contributions based on absolute size of emissions per sector and/or the ranking of emissions based on their economic gross value added; (b) a focus on hard-to-abate sectors (such as production of steel, cement, and fertilizer);² and (c) a “whitelist” approach without a detailed underlying methodology. There are **diverse methodologies to assess material positive or substantial contributions**. These include absolute GHG emission thresholds and thresholds based on the average GHG emissions of new products available; performance thresholds (relative to its peers or based on carbon intensity); a business model’s environmental materiality; and regulatory (or qualitative) criteria.
- **Sectoral coverage is a fundamental parameter in integrating supply chains into alignment approaches**. Fewer than 10 supply chains (such as food and agriculture, construction, automotive production, and freight),³ account for more than 50 percent of GHG emissions. Key supply chains have intermediate steps in EMDEs, where significant emissions are released. Academic literature⁴ recognizes the need to include emissions related to raw material inputs and intermediate processing steps, but alignment approaches do not adequately account for these steps in supply chains.

2 These sectors are usually carbon-intensive sectors with few clear, viable low-carbon alternatives. Yet, research shows there is a lack of academic engagement with phaseout activity in hard-to-abate sectors like steel, cement, and aviation. “The rarity of empirical cases covering such hard-to-abate sectors suggests that actual policies may be limited. Investigating how phaseout strategies can contribute to the decarbonization of these sectors would thus generate valuable insights for practice, while advancing scholarship” (Trencher et al. 2022, 21).

3 The World Economic Forum states that a significant share of these supply chains is indirectly controlled by only a few companies and provides a guide on major initiatives to be undertaken (that is, build a comprehensive GHG emissions baseline; gradually fill with actual supplier data; set ambitious and holistic reduction targets; reconsider [geographic] sourcing strategy, and so on). See WEF (2021).

4 See Rissman et al. (2020). The paper insists that supply-side technologies include energy efficiency (especially at the system level), carbon capture, electrification, and zero-carbon hydrogen as a heat source and chemical feedstock. It highlights promising technologies specific to each of the three top-emitting industries: cement, iron and steel, and chemicals and plastics. These include cement admixtures and alternative chemistries, several technological routes for zero-carbon steelmaking, and novel chemical catalysts and separation technologies.

Figure 9: Main findings—Current state for objectives, sectoral coverage, and assessment methodologies for alignment



Source: Original figure for this publication.

Note: EMDEs = emerging markets and developing economies; EU = European Union; GHG = greenhouse gas; SDGs = Sustainable Development Goals.

- Relatively few frameworks have provided clear guidance on the approach to the scope of GHG emissions reporting and life cycle analysis.** Those frameworks that encompass all of Scope 1, 2, and 3 emissions require companies to develop a full GHG emissions inventory. This requires an understanding of the full value chain of their emissions and, subsequently, focus on the most effective GHG emissions reduction opportunities. A sector-level understanding of emissions, without individual product carbon footprints, seems insufficient to reliably quantify GHG emissions. The literature shows that higher reported emission reductions go hand-in-hand with more granular product-level carbon footprints (Meinrenken et al. 2020), which are currently absent from existing methodologies.
- There is significant variation in the use of statistical classifications,** leading to a series of difficulties for data collection.

C. METHODOLOGICAL SUGGESTIONS TO APPLY THE PRINCIPLE

Applying Principle 1 should include a combination of a principle-based approach and an outcome-based approach.

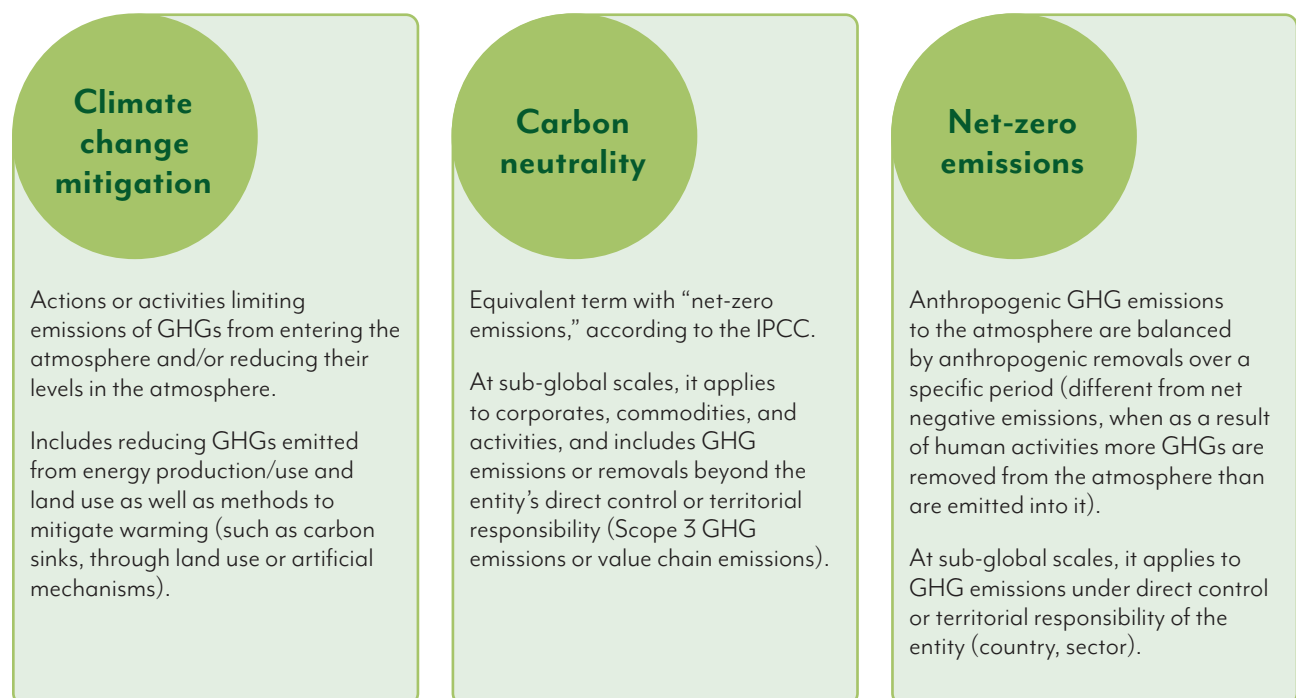
A *principle-based approach* involves the identification of tools to support climate-transitional and solution activities and investments and can be applied at the sector, activity, company, and portfolio levels. An *outcome-based approach* seeks to support real-world decarbonization outcomes by identifying sectors, activities, and technologies, underpinned by technical pathways and emission-reduction actions and targets, and reflecting country/region and sector-specific circumstances.

Design of the Sustainable Finance Alignment Approach

Defining the Objectives and Sectors

- **Alignment approaches need to be based on common and science-based definitions where climate is an objective.** For example, the definitions of climate change mitigation, climate neutrality, and net-zero GHG emissions are all different (figure 10). Definitions may also differ across stakeholders; therefore, they should be clarified when an objective is set.

Figure 10: Science-based definitions in the climate space



Sources: Original figure based on Fankhauser et al. 2022; Jeudy-Hugo, Lo Re, and Falduto 2021; Rogelj et al. 2015.

Note: GHGs = greenhouse gases; IPCC = Intergovernmental Panel on Climate Change..

It is paramount to remember that net-zero GHG targets are only useable to forecast future GHG-emission performance “if they are associated with specific details on how this is to be achieved—therefore allowing to disentangle the different actions and implications on reaching the target.” (Institut Louis Bachelier 2020, 45). (See Principles 5 and 6.)

- **The 2021 Glasgow Climate Pact⁵ recognizes the critical role of protecting, conserving, and restoring nature and ecosystems while delivering benefits for climate mitigation and adaptation.** This agreement also recognizes the importance of ecosystems in achieving GHG neutrality, and, therefore, the role of carbon sinks. Alignment approaches should incorporate this goal into their objective-setting approach.
- **Identifying and setting climate and/or environmental objectives need to correspond to a predefined goal.** Setting climate goals, environmental goals, or both should be based on predetermined ambitions (achieving net zero GHG emissions across the economy by 2050, for example). The approach may evolve in the medium to long term, depending on the progress made in achieving the ambition. (See Principle 4.)

Therefore, identifying the objectives takes into consideration science-based grounds, as previously mentioned, including

- The state of technological development;
- International commitments and ratifications at the national or regional level or both;
- Potential national priorities (for example, NDCs and long-term strategies, GHG neutrality commitments, sustainability road maps);
- The financing needs at the regional, national, or sectoral level, especially for EMDEs and low-income countries (LICs); and
- A principle of “do no harm,” as described further in Principle 2.

A variety of objectives have been adopted across alignment approaches, at all levels, as described previously.

- At the asset level, taxonomies and similar asset-level alignment approaches most commonly adopt climate-related goals (mitigation, adaptation, or both) and other environmental objectives (such as biodiversity and pollution control), and, in some cases, they also adopt the SDGs or just transition–related goals;
- At the entity level, alignment approaches most often have focused on decarbonization goals (supporting climate change mitigation) from a transition planning perspective, a risk-management perspective, or both; and
- At the portfolio level, most methodologies are climate oriented, often from a decarbonization perspective, a temperature threshold perspective, or both.

Ensuring that the alignment approach—especially at the asset and entity levels—leads to material results requires that appropriate objectives have been set. One approach that prioritizes the most appropriate objectives is to **assess the gap between financing flows and financing needs for the relevant objectives (figure 11).**

5 See UNFCCC (2022), para. 38: “Emphasizes the importance of protecting, conserving and restoring nature and ecosystems to achieve the Paris Agreement temperature goal, including through forests and other terrestrial and marine ecosystems acting as sinks and reservoirs of greenhouse gases and by protecting biodiversity, while ensuring social and environmental safeguards.” See also NGFS-INSPIRE (2022), sect. 1.4. “Extending the Case from Climate: The Climate-Biodiversity Nexus.”

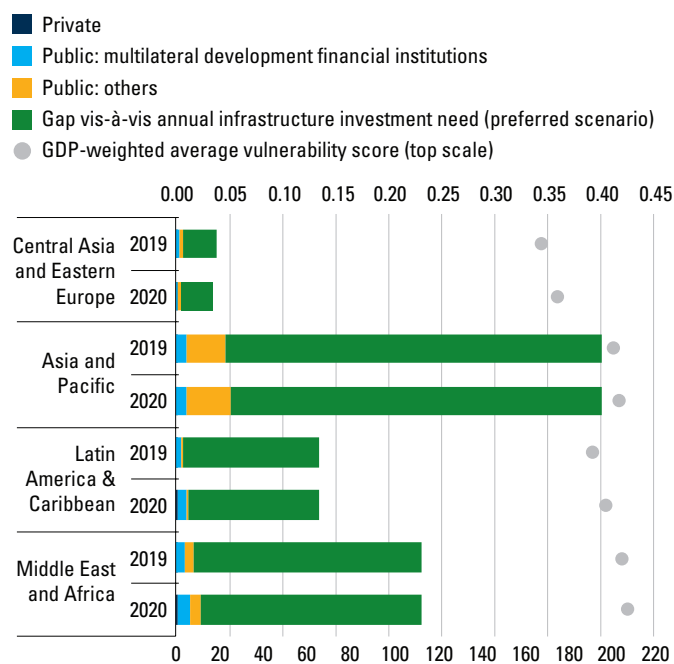
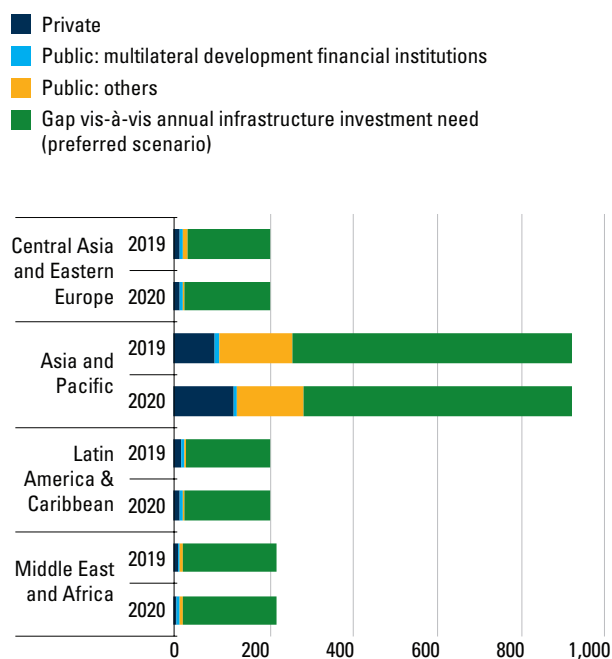
Figure 11: A deep-seated financing gap for climate change mitigation and adaptation that can be evaluated before sectoral prioritization

The overall gap vis-à-vis mitigation needs is high across regions ...

... and even more so for adaptation finance, despite the high level of vulnerabilities to climate change.

a. Global Climate Finance Flows in Mitigation and Infrastructure Investment Needs by Region (billions of US dollars)

b. Global Climate Finance Flows in Adaptation, Infrastructure Investment Needs, and Vulnerability Score by Region (billions of US dollars, bottom; score, top)



Sources: Climate Policy Initiative 2021; Notre Dame Global Adaptation Initiative Country Index; Rozenberg and Fay 2019; UNFCCC, Eora Global Supply Chain Database; Rozenberg and Fay 2019; and IMF staff calculations.

Note: In panels a and b, the infrastructure needs for mitigation include the energy and transport sectors, and infrastructure needs for adaptation include the water and sanitation, irrigation, and flood protection sectors. The climate finance flow includes both emerging market and developing economies and advanced economies in selected regions; the infrastructure investment needs are calculated for all low- and middle-income countries. Therefore, the infrastructure needs gap is underestimated. In panel b, the GDP-weighted average vulnerability score measures a country's exposure, sensitivity, and capacity to adapt to negative effects of climate change. "Private" category is too small to be displayed (always below US\$1 billion).

However, identifying financing gaps is a difficult task. In climate-change mitigation and adaptation, there is a deficiency of data and heterogeneity in quantity and quality and a geographical bias in knowledge. This applies across both advanced and developing economies. In this context, a variety of methodologies, databases, and computations may be used to guide financing priorities including the following:

- **Open-source databases**, such as Intergovernmental Panel on Climate Change (IPCC) data to evaluate climate change mitigation and adaptation financing needs, and Climate Policy Initiative (CPI) data (Naran et al. 2022) to evaluate financing flows. While further developing data infrastructure to track existing flows is a necessity across economies, the data incorporated into NDCs and existing climate and/or environmental road maps at the country and/or regional level may also prove useful.

- A series of valuable **methodologies** may be leveraged for climate-change mitigation and adaptation goals, including :

For climate change mitigation

- **A series of assessments of the investment and spending required to deliver on climate-related goals**, primarily from the UNFCCC and CPI, highlight a wide range of financing needs, reflecting differences in methodologies, scope (including sectoral coverage and the time period considered), data sources, and the ambition of the climate scenario utilized (Songwe, Stern, and Bhattacharya 2022). Despite these differences, not only do they point to priorities that are common across regions (see below: energy transformation, sustainable agriculture, and methane emission abatement), but they also evaluate the needs across regions and subregions.

These assessments need to take into consideration (a) the low additionality component of investments for energy transformation (as compared to investment in other sectors), often due to their accounting into non-climate-oriented infrastructure investment; and (b) the potential cost savings from the shift to a low-carbon system, which are often not included in the scope of assessments of financing needs (for example, savings on costs for fossil fuel production and fossil fuel rents in the context of renewable-energy investment).

- **World Bank modeling of financing needs** (under a chosen reference scenario) in the context of the Country Climate and Development Reports⁶ may also prove a valuable methodological and data source for country-specific alignment approaches that allow for isolating key objectives and sectoral priorities (discussed further later) especially in the climate context.

For climate change adaptation

- **Evaluating vulnerabilities to climate change is a complex task that needs to be tailored to the countrywide and regional requirements**, from both physical (sensitivity to climate-related physical impacts) and economic perspectives. To that end, the IPCC has developed a series of detailed chapters per region and subregion in its Sixth Assessment Report (IPCC 2022a), building on the climate-related impacts and risks (ecosystems, health, water, cryosphere, food, energy, cities and settlements, and migration) and current adaptation barriers and options. Using the data and the recommendation from these chapters may feed into the process for assessing climate change adaptation goals.⁷
- **In addition, the Notre Dame Global Adaptation Initiative (ND-GAIN) Country Index** (Chen et al. 2015) is a free, open-source index that provides a breadth of information on countries' vulnerability and readiness. It assesses countries' current vulnerability to climate disruptions (food, water, health, ecosystem services, human habitat, and infrastructure) and their readiness to leverage private and public sector investment for adaptive actions, based on economic, governance, and social readiness criteria. The index compiles more than 74 variables to form 45 core indicators to measure the

6 This group notably helps attract funding and direct financing for high-impact climate action. The Country Climate and Development Reports may be found at <https://www.worldbank.org/en/publication/country-climate-development-reports>.

7 IPCC (2022a) and the efforts of Working Groups II and III assess the vulnerability of socioeconomic and natural systems to climate change, negative and positive consequences of climate change, and options for adapting to it.

vulnerability and readiness of 192 UN countries, from 1995 to the present. The availability of data sources used for computing the ND-GAIN Index makes it a useful tool for evaluating financing needs for adaptation and priority areas.

- **The methodology developed by the World Bank** (Rozenberg and Fay 2019) is useful for assessing the gap for adaptation finance in EMDEs and LICs. Given the complexity of the estimation of how much infrastructure is needed (due to multiple and, sometimes, competing goals, and the indirect link between physical infrastructure and the services to be delivered), this methodology is based on scenario analysis that allows for informed policy making by exposing cost drivers and shedding light on the implications of assumptions about uncertain parameters. The authors have developed a framework to identify (a) the multiple objectives motivating infrastructure investments, (b) the multiple metrics required to assess success, (c) the technical and policy options available to reach the objectives, and (d) the exogenous factors that influence the cost and success of the investments. This methodology may prove useful for assessing the relevance of climate change adaptation as a primary goal in the design of an alignment approach.

For other environmental objectives

- Alignment approaches may also consider multiple objectives (for example, EU and ASEAN taxonomies, multi-objective transition planning initiatives, and so on), which may be developed with a phase-in approach, considering (a) the interactions—and potential trade-offs⁸—between climate and/or environmental goals (or other sustainability goals); and (b) the feasibility of the application of a “do no significant harm” approach to these objectives (see Principle 2), to avoid potential trade-offs or undesirable effects.

Other environmental goals may encompass the protection of healthy ecosystems and biodiversity (for example, the ASEAN taxonomy makes the connection between ecosystems and GHG neutrality, as well as that of adaptation to climate change and food and water security) or the transition to a circular economy, often with a view to decoupling economic growth from resource use and its environmental impacts.

Sectoral prioritization is a crucial step in the design of an alignment approach, primarily at the asset and at the entity level, and most particularly for climate change mitigation–related goals.

Three key principles should preside over the sectoral prioritization step in this process:

- **Broad coverage** that considers the multidimensional approach to climate change mitigation—a “systems transition,” (IPCC 2022a).⁹ Alignment under the Paris Agreement Article 2.1c applies to all sectors. Sectors are also inherently linked through their value chains or Scope 3 emissions.
- **Clear-cut terminology use**, with a distinction between (a) economic sectors (for example, the energy sector); (b) economic activities (for example, electricity production from wind energy); (c) industrial processes and technologies on the supply and demand side (for example, energy efficiency, carbon capture and storage, electrification, circular

8 For a trade-off example from the food sector, see Baldwin-Contello et al. (2020).

9 Further, chapter 18 (2657) of IPCC 2022b emphasizes, “**Current development pathways, combined with the observed impacts of climate change, are leading away from, rather than towards, sustainable development, as reported in recent literature (moderate agreement, robust evidence).** While demonstrable progress has been made on some of the Sustainable Development Goals (SDGs), significant gains across a range of targets are still necessary, as is enhancing synergies and balancing and managing trade-offs. Severe risks to natural and human systems are already observed in some places (*high confidence*) and could occur in many more systems worldwide before mid-century (*medium confidence*) and by the end of the century at all scales, from the local to the global, and at all latitudes and altitudes (*high confidence*).” Chapter 18 of the report continues (2658), “**Systems transitions can enable CRD [climate resilient development] when accompanied by appropriate enabling conditions and inclusive arenas of engagement** ... These system transitions are necessary precursors for more fundamental climate and sustainable-development transformations; but can simultaneously be outcomes of transformative actions.” [Emphasis in italics and bold is in the original.]

economy interventions, reductions in material waste and material-efficient design, material substitution, novel chemical catalysts and separation technologies, alternative chemistries, and so on); and (d) companies and other entities.

- **A distinction between sectors with high decarbonization potential** (either with available low-carbon activities/technologies at scale, or with transitional activities/technologies in hard-to-abate sectors) **and those with an enabling potential.**

According to the Glasgow Financial Alliance for Net Zero (GFANZ), alignment approaches should drive potential for real-economy emissions reduction in financial market participants' activities, recognizing that the financial sector has a role in supporting the real economy “by facilitating the allocation of capital and providing related services” (GFANZ 2022a, 8). Given the carbon-intensive nature of economies, alignment approaches need to promote a substantial contribution to climate-related goals by scaling up zero-carbon alternatives to high-emitting activities, especially those in hard-to-abate sectors, as a prerequisite to phasing out high-emitting assets. The industry is indeed at the core of developing these low-carbon solutions, as it produces a variety of enabling technologies (for example, renewable electricity generation facilities). It therefore has a dual role of reducing GHG emissions from its own operations while supplying transformational technologies and infrastructure.

For these reasons, ensuring that alignment approaches enable the financing of transformational technologies and infrastructure *via* this dual approach (direct contribution to decarbonization/enabling role) is key. Box 2 discusses the translation of specific temperature objectives into benchmarks as part of portfolio-level alignment approaches.

A **three-step approach** may be adopted :

1. Identifying sectors on the basis of a common understanding of their potential contribution to net-zero emission reductions.

A body of research is available to assess the contribution of sectors to GHG emission reductions on the basis of their current GHG emissions (such as the World Resources Institute’s Climate Analysis Indicators Tool¹⁰) and their potential for emissions reduction. For the latter, it is recommended to base the analysis on relevant IPCC research on mitigation options (IPCC 2022a).

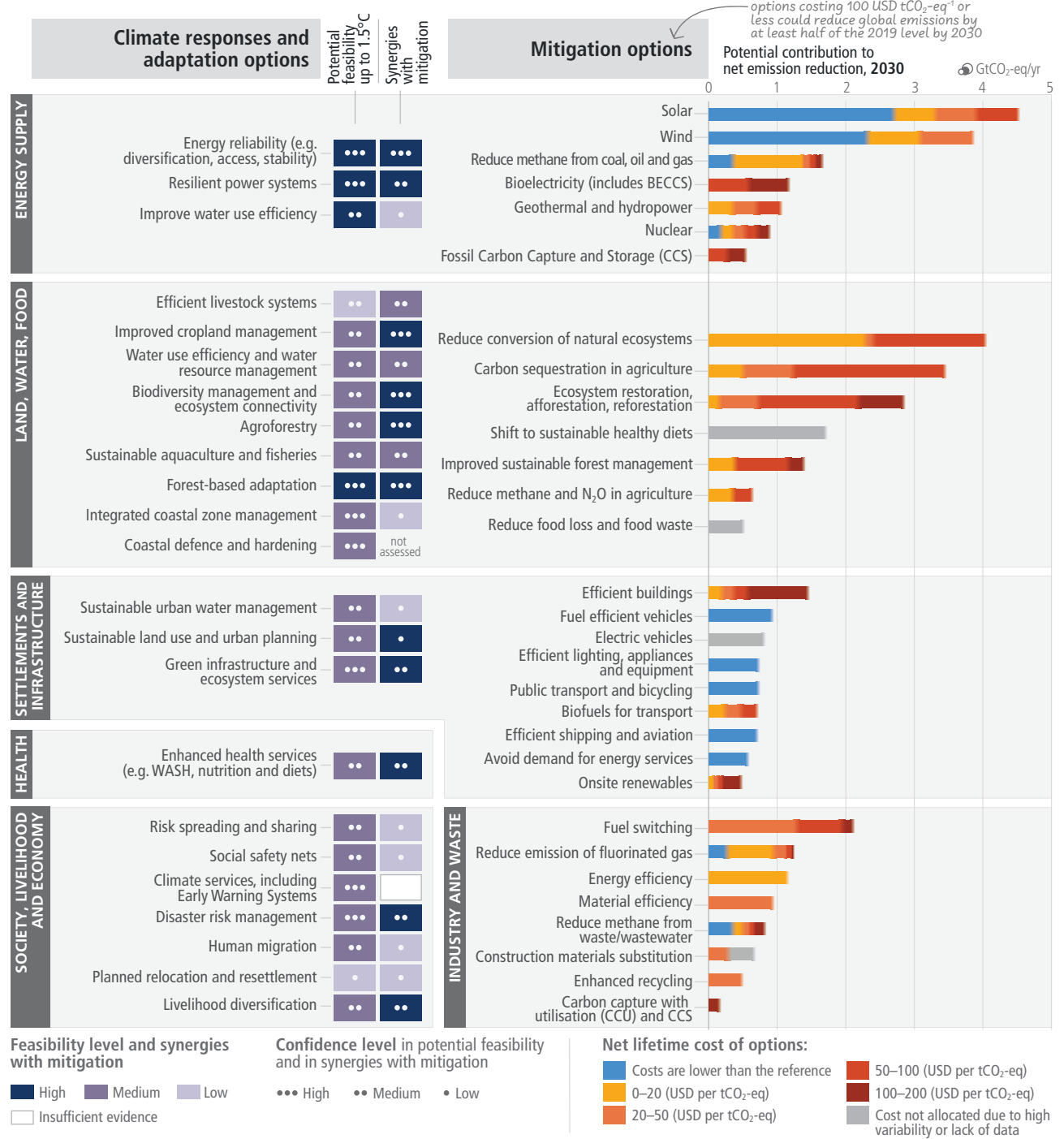
The IPCC has identified mitigation options that cost US\$100 per ton of carbon dioxide equivalent in a year (tCO₂-eq-1) or less that could reduce global GHG emissions by at least half of the 2019 level by 2030, as shown in figure 12, across five main areas: energy; industry; buildings; transport; and agriculture, forestry, and other land use (AFOLU). Although the mitigation potentials and costs of individual technologies in a specific context may differ greatly from the IPCC-provided estimates, the IPCC figures may constitute a good starting point.

10 This tool presents relevant data about sectoral GHG emissions and reduction potential: CAIT Climate Data Explorer, World Resources Institute, <https://www.wri.org/data/cait-climate-data-explorer>.

Figure 12: IPCC mitigation options

There are multiple opportunities for scaling up climate action

a) Feasibility of climate responses and adaptation, and potential of mitigation options in the near term



Source: IPCC 2023, 69.

In line with a distinction between supply-side and demand-side interventions (Rissman et al. 2020), table 2 can be used as a basis for identifying emissions-reduction measures:

Table 2: Distinction across five main sectors of activities and decarbonization levers on the supply and demand side

Emissions reduction potential on the supply side		Emissions reduction potential on the demand side
Energy	<ul style="list-style-type: none"> ■ Renewable energy (wind, solar, bioelectricity, hydropower, geothermal energy, and so on) ■ Hydrogen ■ Electrification ■ Energy efficiency ■ CCS/CCU ■ Reduce emissions from coal mining and from oil and gas production 	<p>Most activities identified by the literature relate to (a) circular economy (waste management and recycling); (b) material efficiency and substitution; (c) sustainable inputs to production and services (for example, renewable energy, sustainable wood); and (d) sufficiency (for example, reduce and avoid demand for energy and other products).</p> <ul style="list-style-type: none"> ■ Material efficiency and material substitution ■ Circular economy (enhanced recycling) and reduction in material use ■ Industry 4.0
Industry	<ul style="list-style-type: none"> ■ Fuel switching ■ Feedstock decarbonization, process change ■ CCS/CCU ■ Reduction of non-CO₂ emissions 	<ul style="list-style-type: none"> ■ Reduce and avoid demand for energy services ■ Onsite renewable production and use ■ Enhanced use of wood products
Buildings	<ul style="list-style-type: none"> ■ Efficient equipment and lighting ■ High energy performance in new buildings ■ Improvement of existing building stock 	<ul style="list-style-type: none"> ■ Shift to public transportation and to bikes
Transport	<ul style="list-style-type: none"> ■ Fuel-efficient and electric light-duty vehicles ■ Fuel-efficient and electric heavy-duty vehicles ■ Efficiency and optimization in shipping ■ Energy efficiency in aviation ■ Use of biofuels 	<ul style="list-style-type: none"> ■ Reduce food loss and waste
AFOLU	<ul style="list-style-type: none"> ■ Carbon sequestration ■ Reduce CH₄ and N₂O emissions in agriculture ■ Reduced conversion of forests and other ecosystems ■ Ecosystem restoration, afforestation, and reforestation ■ Improved sustainable forest management 	

Source: Original table for this publication.

Note: AFOLU = agriculture, forestry, and other land use; CCS/CCU = carbon capture and storage/carbon capture and utilization; CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrous oxide. The use of nationally determined contributions (NDCs), which sometimes incorporate a sector-oriented perspective, can also prove useful to support prioritization (see Principle 5 for advantages and drawbacks of the use on NDCs for alignment approaches).

2. Assessing the economic relevance of sectoral coverage at the country and/or regional level (for asset-level approaches) and/or the entity level (for entity-level approaches).

When designing an alignment approach, it is worth questioning

- **Whether sectors have a material contribution to the gross domestic product (GDP) from the demand perspective, or to the gross value added (GVA) from the supply/production perspective.** From an entity-level alignment perspective, it would be valuable to consider the role of given economic activities in turnover and capital expenditure investment to ensure material transition planning.
- **The relevance of sectors and related activities, and considering their role in supply chains.** As such, EMDEs, companies located in EMDEs, or both may consider solutions to mitigate against path dependence for relevant industries, especially in the manufacturing and agriculture sector. (See appendix A.)

3. When appropriate, clarifying the contribution of sectors according to a “three-bucket” approach, that is, low-carbon solutions, aligning with net-zero (or other climate-related) goals, and managed phaseout.

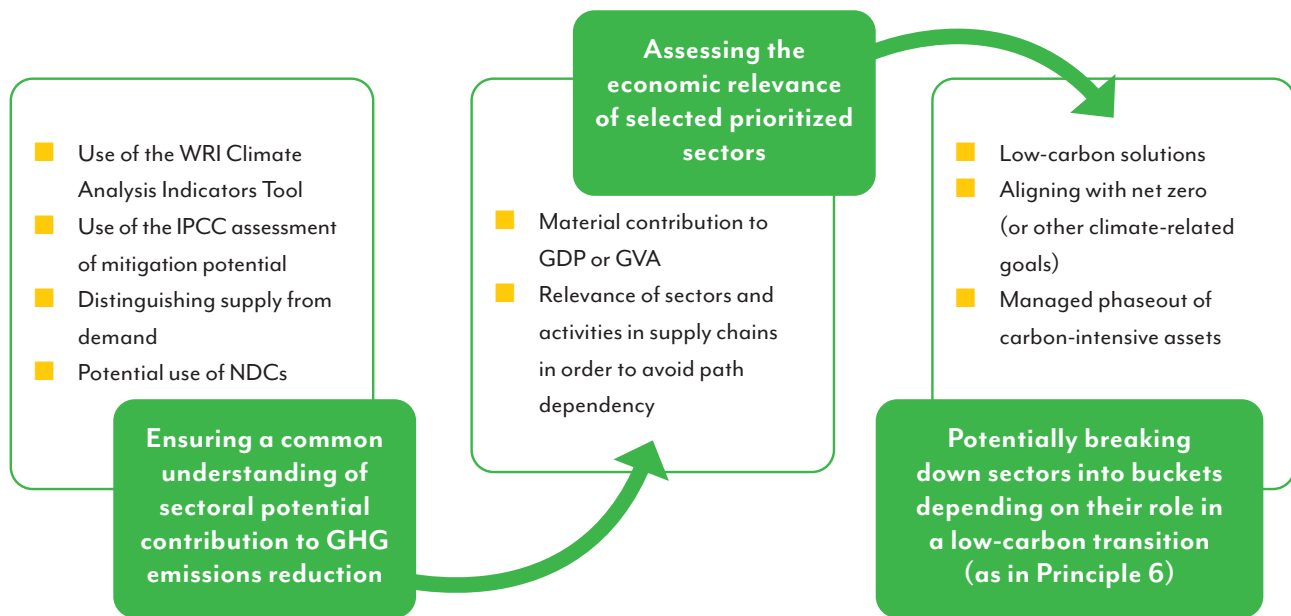
At both the asset and entity levels, in line with the series of financing strategies used by GFANZ to define transition finance (GFANZ 2022a), it is worth considering the following breakdown. (See Principle 6 on Transition for further detail.)

- **“Low-carbon solutions”** are those activities and/or technologies and processes intended to provide a direct decarbonization outcome (or assist to provide a direct decarbonization outcome), as a substitute for carbon-intensive technologies or services.
- **“Aligning with net-zero (or other climate-related goals)”** are those activities and/or technologies that signal transitional alignment behavior and that support the implementation of changes to deliver climate-related targets.
- **“Managed phaseout”** are those activities in which underlying carbon-intensive physical assets need to be phased out (for example, early retirement of assets on a time frame consistent with the broader net-zero trajectory).¹¹

This three-bucket approach is intended to ensure that financial-market participants can assess the position of entities, and underlying assets, on a transition path and calculate the distance between current assets and predetermined climate-related goals. Figure 13 illustrates the three-bucket or three-step approach.

¹¹ For broader recent literature on managed phaseout, see GFANZ (2022c); Kekki and Holzman (2023); and Pinko and Pastor (2023).

Figure 13: A three-step approach to prioritizing sectoral coverage in asset- and entity-level approaches



Source: Original figure for this publication.

Note: GDP = gross domestic product; GHG = greenhouse gas; GVA = gross value added; IPCC = Intergovernmental Panel on Climate Change; NDCs = nationally determined contributions; WRI = World Resources Institute.

This approach may be adapted for other climate, environmental, or sustainability goals, using a science-based (or, at a minimum, an evidence-based) assessment of each sector's contribution to these goals.

Box 2: Translating Temperature Objectives and Related Carbon Budgets into Benchmarks as Part of Portfolio-Level Alignment Approaches: Ensuring a Substantial Contribution to Decarbonization Goals within Portfolios

Although substantial progress is still being made in developing methodologies to measure alignment of financial portfolios, a few methodological principles can be laid out now to grasp the application of Principle 1 to portfolio-level alignment approaches (Noels and Jachnik 2022).

At the heart of portfolio alignment methodologies lies an acknowledgment that the alignment of portfolios needs to be broken down by financial asset classes and individual assets. Alignment assessments of financial portfolios require the assessment of each individual asset so as to not obscure poor-performing portfolio segments. Moreover, portfolio methodologies have not agreed on aggregation approaches because aggregation is complicated by technical and practical challenges. Aggregated portfolio metrics struggle with robustness owing to coverage gaps, methodological inconsistencies, and double counting risks. Hence, alignment approaches typically remain at the asset level.

- **At the core of such approaches lies the assessment of a company (or an entire portfolio of company exposures) on a transition pathway and ultimate goal**—often an assessment relative to a benchmark (Portfolio Alignment Team 2020).

Target-setting frameworks often do not offer guidance on ways to measure the deviation from a given target (or climate-related goal) or to identify different degrees of alignment, as explained by the Task Force on Climate-Related Financial Disclosures (TCFD) Portfolio Alignment Team (PAT). Tools have been developed to help financial market participants identify the performance levels of companies with differing emission trajectories (for example, the Transition Pathway Initiative discloses information on companies' emission intensity and their distance to sectoral pathways, and the Paris Agreement Capital Transition Assessment [PACTA] discloses the percentage deviation of portfolios' asset allocations from trajectories aligned with given temperature scenarios).

The TCFD PAT report provides relevant methodological advice to ensure metrics are “consistent with a necessary transition in the hard to abate sectors and jurisdictions (granular scenarios) and recognize future transition plans (emissions targets) to facilitate the additional flow of capital to the areas where it is needed the most” (Portfolio Alignment Team 2020, 22).

- **The first key step in assessing substantial contribution is to translate carbon budgets into benchmarks**, with underlying scenarios used as inputs in these metrics that are sector- and region-/country-specific and updated regularly to accommodate various decarbonization trajectories. Sectoral pathways provide the link between the science of the remaining carbon budget and the detailed steps that a specific sector could take to reduce greenhouse gas (GHG) emissions to a particular level within a specified time frame.

Continue on the next page

The TCFD PAT report (Portfolio Alignment Team 2020, 24–28) details the methodology behind selecting (a) the type of benchmark (that is, an emissions pathway associated with a given temperature being the simplest approach that could be adopted); (b) the degree of granularity of the benchmark (that is, global or sector/country specific); and (c) a unit by which to express this benchmark (that is, emissions intensity or absolute emissions).

Concerning step (b), it is worth noting that the simplest approach is to assess the performance of companies and portfolios relative to a global scenario (for example, the Intergovernmental Panel on Climate Change [IPCC] 1.5 °C Report scenario). Nonetheless, given that portfolios do not tend to be diversified across all sectors and geographies, **sector- and country-specific benchmarks are better suited to reflect the variety of abilities that entities employ to effectively decarbonize across the board.**

These benchmarks also allow hard-to-abate sectors (as well as countries and regions) to be identified by alignment approaches and to attract capital flows. Such benchmarks must be regularly updated to keep current with technological, economic, and climate-science evolutions.

For example, the Sectoral Decarbonization Approach (SDA) is a sectoral approach based on International Energy Agency (IEA) 2°C scenario, differentiated from other methods in that it adopts a subsector-level method and a global, least-cost mitigation perspective. It allows companies in homogenous, energy-intensive sectors (for example, energy, manufacturing industry, transport, and buildings) to align emission-reduction targets with a shared pathway. The data are aggregated by identifying the various economic activities of a company, with some possibly falling under multiple sector categories).

The GFANZ report on use of sectoral pathways for financial institutions (GFANZ 2022b) also is worth noting. It is intended to support the use of sectoral pathways in creating net-zero transition plans, aligning their portfolios, and engaging with real-economy firms.

■ A second step lies in **assessing company-level alignment before performing aggregation from the company to portfolio level.**

Moving from entity-level to portfolio-level alignment approaches may prove challenging, as the latter often measure the proximity between the climate performance of a portfolio, which may be captured in various ways (for example, carbon footprint, share of taxonomy-aligned activities, and scoring), and a given temperature benchmark.

Aggregating results for individual financial assets to the portfolio level requires

■ **Weighing the contribution of different assets across different sectors** (the assessment of which typically relies on the above-mentioned sector-specific scenarios and metrics);

- **Adjusting for the potential double counting of GHG emissions**, where relevant (especially when each asset is assessed across Scopes 1, 2, and 3). Current climate-alignment assessment methodologies often do not explicitly address this aspect, although within the financial value chain, double counting of GHG emissions can occur at multiple levels (for example, between transactions within the same financial institutions, or across different asset classes). Double counting is problematic for portfolio-level assessments of climate alignment if GHG emissions that are counted double are interpreted;
- **A full sectoral coverage**. Gaps in the sectoral coverage of alignment approaches prevent the calculation of a portfolio-level assessment; and
- **Taking the risk of potentially masking individual activities that may be misaligned with climate-related objectives**, thereby obscuring asset-level performance and raising environmental-integrity concerns.

These issues become even more complex when considering portfolio-level aggregation across multiple asset classes, (for example, corporate-related equity and debt, sovereign bonds, real estate and infrastructure—some of which are underrepresented in current methodologies). To estimate a portfolio's temperature alignment, one of the following approaches for aggregating entity-level assessments must be used: (a) a weighted average of asset-level assessments or (b) an aggregation of asset-level under- or overshoot of absolute GHG emissions. No clear, dominant aggregation approach applies across all climate-alignment assessment methodology providers, so in both approaches the exact calculations may differ by asset class.

Alignment approaches are also increasingly integrating the idea of alignment of current GHG performance and targeted GHG performance. In this context, portfolios can be assessed based on the shares of assets that fall in different buckets of an alignment maturity scale. For example, the Institutional Investors Group on Climate Change (IIGCC) in 2021 proposed the following: Not aligned, committed to aligning (company with aligned targeted GHG performance), aligning (company on a pathway to aligned GHG performance), aligned (company with aligned current and targeted performance), and net zero (company that achieved net zero emissions).

Therefore, it is essential to

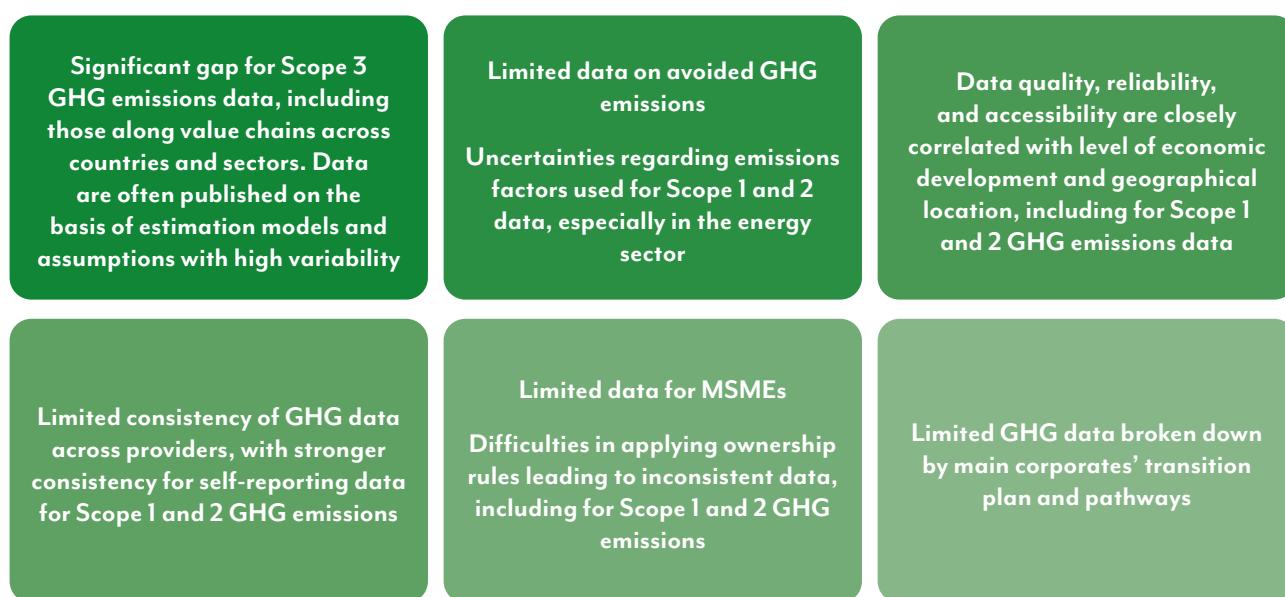
- **Ensure careful consideration and methodological transparency** to portfolio-alignment methodologies;
- **Apply, at a minimum, an aggregation method at asset-level** within financial portfolios; and
- **Further reflect on which approaches and weighting schemes are consistent** with driving the real economy transition.

Definition of the Key Contribution-Related Characteristics of the Alignment Approach

Alignment approaches all should use the same metrics approach to assess GHG emissions (across three scopes) and on performing life cycle analysis (based on existing international standards).

The current lack of high-quality, reliable, and comparable data on GHG emissions reveals a pressing need to incorporate such data—alongside context-based GHG emissions metrics—in alignment approaches. Figure 14 outlines challenges that have been identified by the available literature.

Figure 14: Data-related challenges in GHG emissions assessment



Source: Original figure for this publication.

Note: GHG = greenhouse gas; MSMEs = micro, small, and medium enterprises.

Therefore, alignment approaches should clearly identify the type of GHG performance metrics that can be used to assess the climate-alignment of corporate targets (table 3).

In measuring the GHG performance of financial assets, climate-alignment assessment methodologies may indeed use a variety of metrics, while also allowing for alternative timelines and some differences in the types and scopes of GHG emissions they cover, according to OECD (Noels and Jachnik 2022). Metrics to assess the GHG performance of financial assets can be in absolute or intensity terms, and the exact specification of these metrics may differ depending on the financial asset class, but also should account for data needs and the sectoral approach pursued by the taxonomy. (Noels and Jachnik 2022).

Table 3: Assessment of existing methodologies to identify GHG performance metrics

	Advantages	Disadvantages	Application to EMDEs
<p>Absolute Emissions Contraction</p> <p><i>Rate of change in GHG emissions, reflecting absolute GHG emissions</i></p>	<p>Application to all asset classes.</p> <p>Enhanced predictability for GHG emissions and less data intensive.</p> <p>Context-based metric, relating to the remaining carbon budget and climate impacts of cumulative GHG emissions.</p> <p>Incentivizes efficiency improvements and product substitution.</p>	<p>Influence of changes in output may be detrimental to climate performance assessment.</p> <p>Less adapted for MSMEs and young companies considering the relation with output growth.</p>	<p>Low data needs and high data availability.</p> <p>Incentivizes efficiency improvements and enhanced engagement within the value chains.</p> <p>Relation with output growth may be disincentivizing for developing economies.</p>
<p>Sectoral Decarbonization Approach</p> <p><i>GHG emissions divided by physical output, reflecting GHG performance and efficiency</i></p>	<p>Application to all types of entities regardless of output growth and price changes.</p> <p>Application to homogenous sectors, companies, and asset classes.</p> <p>Incentivizes efficiency improvements and product substitution.</p>	<p>High data needs.</p> <p>Complex for heterogenous companies and asset classes.</p> <p>Intensity-based measure ignoring potential increase in absolute emissions.</p>	<p>Context-based metric easily connected to NDCs and other types of strategic drivers for taxonomies.</p> <p>Incentivizes efficiency improvements and enhanced engagement within the value chains.</p> <p>Disincentivizing factors may be high data needs and low data availability.</p>
<p>Economic Intensity Contraction</p> <p><i>GHG emissions divided by economic output, reflecting GHG performance and efficiency</i></p>	<p>Application to nonhomogenous sectors, companies, and asset classes.</p> <p>Incentivizes efficiency improvements and product substitution.</p>	<p>Volatility with macroeconomic environment, and lack of predictability in measuring and tracking GHG emissions over time.</p> <p>Intensity-based measure ignoring potential increase in absolute emissions.</p>	<p>Context-based metric easily connected to NDCs and other types of strategic drivers for taxonomies.</p> <p>Incentivizes efficiency improvements and enhanced engagement within the value chains.</p> <p>Relation to economic output and sensitivity to the macroeconomic environment may be disincentivizing factors</p>

Sources: Noels and Jachnik 2022; research by project team.

Note: EMDEs = emerging markets and developing economies; GHG = greenhouse gas; MSMEs = micro, small, and medium enterprises; NDCs = nationally determined contributions.

More broadly, a strong assessment should be performed ex ante to determine the most effective metric to measure climate performance and integrate into the alignment approach. Given that various metrics have different (dis)advantages and highlight different aspects of corporate climate performance, this paper offers transparency on the various metrics and indicators that may complement rather than substitute, allowing for a more holistic overview.¹²

- While **GHG emissions metrics** are widely used and are applicable to all sectors and a wide array of asset classes, their backward-looking nature—in the absence of forward-looking estimates—and difficulties in attributing change to corporates’ decarbonization strategies may lead to lock-in risks. It is key that there is no differentiation, per se, across types of technologies and activities when relying on GHG emissions metrics and that captured energy efficiency measures are aggregated with other decarbonization efforts. The applicability of these metrics for real estate and sovereign assets is a concern as well.
- **Technology mix metrics**, such as energy-mix metrics, benefit from a stronger correlation with an activity and/or technology-based approach in taxonomies for an underlying company and/or portfolio. These metrics focus more on the feasibility and means to achieve decarbonization objectives than GHG emissions metrics. However, in the absence of consensus on optional technology mixes and, given the continuous scientific and technological evolutions at play, they may be less flexible than GHG emissions metrics when incorporated into taxonomies. Technology data also need to be used, which may limit the quality and availability of a technology mix metric in some sectors, while it is primarily available for carbon-intensive sectors.
- **Alternatives to target-based assessments**, use other inputs and metrics to measure the climate-mitigation performance of corporates (for example, short-term capital expenditure plans of companies to assess changes in future production capacity of emissions-intensive goods; green patents and green research and development [R&D] expenditures; and use of past GHG emissions reductions). These should be carefully considered when designing taxonomies (see Principle 6).

Various critical concepts must be carefully considered when designing such metrics, including

- **Taxonomies should make clear which type of greenhouse gas** (for example, carbon dioxide, methane, or all types) should be included in the metric. Potent non-carbon GHGs may be relevant from a sectoral perspective and, thus, should be included. (See Principle 5 and Buck et al. 2023.)
- **Credible metrics are expected to cover life cycle GHG emissions**, both in absolute and intensity-based terms, and for subsidiary companies.¹³
- **The integration of Scope 2 GHG emissions** (that is, indirect GHG emissions associated with the purchase of electricity, steam, or heating or cooling) may lead to harmonization-related challenges, depending on the allocation method chosen from the GHG Protocol methodology (that is, market-based, using emission factors from contractual instruments, or location-based, using the average emissions intensity of the grid). This integration is key to harmonize such methods within the taxonomy, given both the significant emission source and operational costs associated with Scope 2 GHG emissions, as well as the levers available to reduce them, including energy efficiency, low-carbon electricity, and heat supply.

¹² For additional information, see Paris Agreement Capital Transition Assessment, “Metrics,” <https://www.transitionmonitor.com/pacta-for-investors/metrics/>.

¹³ For useful guidance, refer to the GHG Protocol: <https://ghgprotocol.org/life-cycle-databases>, which provides a list of available third-party databases to assist users in collecting data for product life cycle and corporate value chain (Scope 3) GHG inventories.

- **The inclusion of Scope 3 GHG emissions** in taxonomy design and in disclosures (see Principle 4) should be of primary concern, as there is growing consensus on the need to access Scope 3 data across value chains to the extent possible, despite methodological uncertainties. Data on Scope 3 are very often estimated and show the most significant gaps (NGFS 2022), yet they are critical to the credibility of climate-related targets. In the meantime, corporate Scope 3 emissions are on average 5.5 times the levels of combined Scope 1 and Scope 2 emissions (Shrimali 2021). Therefore, focusing only on Scope 1 and 2 emissions would, indirectly, make users—rather than producers—own the decarbonization responsibility.

For all these reasons, it is important that, to the extent possible, GHG emissions metrics incorporate Scope 3 GHG emissions to accurately capture the climate-related impacts of a sector, an activity, a company and/or an asset, and, thus, provide a substantial basis on which to define opportunities for emission reductions.

That said, taxonomies should be careful to include Scope 3 GHG emissions in climate performance targets, whenever relevant from a sectoral perspective (that is, carbon-intensive sectors) and to the extent possible. However, MSMEs and companies located in EMDEs benefit from a more flexible approach, depending on their positioning across key value chains. In any case, the taxonomy should detail to what extent and why such emissions are incorporated into the metrics and targets. The basis for measurement across supply chains may also be described, if appropriate from a sectoral perspective. To avoid double counting across value chains and for the three scopes of GHG emissions, methodologies exist in the case of sector-specific contraction or convergence objectives (“climate performance should converge to X for a given asset”) to include the relevant perimeter; these use a so-called stakes approach (Institut Louis Bachelier 2020, 85)¹⁴ (that is, the decarbonization scope depending on the level of responsibility a company has on a specific activity and the associated emissions’ magnitude).

- **Avoided emissions**¹⁵ (that is, the difference in the level of GHG emissions compared with a reference scenario, due to an entity’s intervention within its environment or outside its value chain, such as sales of low-carbon solutions/services or the financing of third parties’ low-carbon projects). Avoided emissions are not captured by current temperature-alignment methodologies that rely on GHG emissions and technology exposure. While they support increased understanding of the impacts of single companies inside and outside of individual value chains with respect to potential opportunities to increase positive impacts, there are no agreed methods or standards to count counterfactuals and calculate avoided emissions. Moreover, avoided emissions do not occur during a given product’s life cycle inventory. Hence, avoided emissions cannot be integrated in alignment approaches but could be considered a complementary metric to identify potential benefits of assets and technologies. A further word of caution: underlying methodologies *must* determine if a potential difference in the level of GHG emissions, compared with a reference scenario, corresponds to a real, tangible decrease in GHG emissions in the real economy compared with the existing situation. The objective is to ensure that GHG emissions actually decrease (rather than increase more slowly than in a baseline scenario). The solution lies in setting targets for avoided emissions inside and outside the value chain.

- **Alignment approaches may cautiously integrate carbon offsetting-related activities, with the inclusion of carbon capture utilization and storage (CCUS) technologies as enabling activities** in carbon-intensive sectors, activities, and assets such as manufacturing, and the electricity production sector with retrofitting practices.¹⁶

14 The report states: “In the context of portfolio temperature alignment assessments, a value-chain view is necessary. For certain sectors, most of their carbon emissions, negative or positive, lies within value chains. Methods that focus on scopes 1 and 2 may penalize “green” companies, under certain circumstances. It is necessary to change our point of view, from “scopes” to “stakes”, to map companies to their relevant pathway, thereby allowing us to evaluate entire value chains based on the main decarbonization stake” (Institut Louis Bachelier 2020, 85).

15 For further guidance, see WBCSD (2023).

16 Literature on the role and limitations of CCUS technologies is abundant. See, for example, IEA (2020).

The IPCC has indeed recently underlined its key role to limit warming to 1.5°C with no or limited overshoot, depending on assumptions about costs, availability, and constraints. It has specified that CCUS is an option to reduce emissions from large-scale, fossil-based energy and industry sources, provided geological storage is available. These CCUS methods are considered mature technologies for gas processing and enhanced oil recovery, although they are considered less mature in the power sector, as well as in cement and chemicals production, where they would constitute a “critical mitigation option.” Moreover, the potential of CCUS as a technology solution can be assessed along the value chain.

The reliance of most existing energy-climate scenarios on the use of CCUS technologies associated with carbon removal, which sometimes allow a short-term GHG-emissions overshoot, also supports that taxonomies should not overlook these technologies. In addition, the IPCC emphasizes that modeled mitigation strategies to achieve GHG emissions reductions include “transitioning from fossil fuels without CCS to very low- or zero-carbon energy sources, such as renewables or fossil fuels with CCS, demand side measures and improving efficiency, reducing non-CO₂ emissions, and deploying carbon dioxide removal (CDR) methods to counterbalance residual GHG emissions” (IPCC 2022c, line C.3). The deployment of carbon dioxide removal to counterbalance hard-to-abate residual emissions is indeed “unavoidable” if net-zero GHG emissions are to be achieved.

Disclosure-related impacts of integrating such technologies are clearly an area that requires attention; a notable difficulty lies in the fact that CCUS activities currently are not extensively captured by ISIC.

- ◆ **Carbon dioxide removal from CCUS.** While carbon removal captures carbon dioxide from the atmosphere, CCUS captures carbon dioxide from facilities such as coal-fired power plants and cement factories, and then sequesters it underground and/or uses it to produce commercial products such as synthetic fuels. However, CCUS in fossil-fueled power plants and captured carbon in short-lived products cannot be counted as carbon removal because it does not lead to effectively reducing GHG levels. It, therefore, plays an important role in long-term climate strategies.
- ◆ **Carbon dioxide removal from offsets.** These are actions or projects that reduce the amount of carbon dioxide released into the atmosphere, including energy efficiency improvements, renewable energy developments, ecosystems conservation, and using nature for sequestration purposes, among others. In contrast, carbon dioxide removal from CCUS is a particular type of offset that extracts, but does not reduce, carbon dioxide from the atmosphere.

In either case, transition plans must make a sound use of these offsetting techniques (see Principle 6) by guaranteeing that offsetting and greenhouse gas emissions reduction in the value chain are viewed and utilized as two distinct actions. They, therefore, should be presented separately, as in target setting, given their different added value in mitigating climate change. Moreover, it is essential that such plans establish a clear-cut difference between carbon removal and carbon credits, within and outside and inside the value chain. These plans must also specify the type of offset and its potential certification (for example, Verified Carbon Standard) as well as the conformity to the San Jose Principles (2019), in addition to reporting an entity’s gross greenhouse gas (that is, not including any offset efforts). Counting offsets in achieving emissions-reduction targets should not be integrated into such plans.¹⁷

- ◆ A summary of the key GHG emissions calculation methodologies used by nonfinancial corporate entities, corporate entities, and international development finance institutions is included in box 3.

¹⁷ To read the IMF’s reply to the ISSB July 2022 consultation on the climate exposure draft, see the July 28, 2022, comment letter at https://ifrs-springapps-comment-letter-api-1.azuremicroservices.io/v2/download-file?path=611_65982_international-monetary-fund--imf--feedback-on-issb-on-work-sustainability-and-climate-related-disclosures.pdf.

Box 3: GHG emissions calculation methodologies

While there remain disclosure gaps and comparability issues with corporate emissions data, a range of standards and approaches exist to account for corporate greenhouse gas (GHG) footprints.

- For nonfinancial corporates, the **GHG Protocol** provides guidelines for them to measure and manage GHG emissions. In parallel, a range of **sectoral guidance** on calculating life cycle emissions have been developed, for example by the World Steel Association.
- For financial corporates, **PCAF** provides a Global GHG Accounting and Reporting Standard (2022) to measure financed emissions, facilitated emissions, and insurance-associated emissions.
- In the international development finance space, the **IFI approach** to GHG accounting for energy efficiency projects provides a standardized framework to quantify and report GHG emissions reductions from such projects.

Although these standards serve different audiences, they are inherently linked. Several limitations remain—for instance, with respect to organizational boundaries, Scope 3 calculations, and emissions factors – that may cause differences in emissions data.

GHG emissions assessment methodologies need to be sectoral, and hence scopes and boundaries can differ. Sectoral consistency across methodologies should be obtained in terms of scope and boundaries. A common approach should establish consistent methodologies and calculation procedures for estimating GHG emissions. This requirement includes defining emission factors, data collection methods, and calculation formulas. A common approach should address challenges related to data collection, including data availability, reliability, and consistency. It should provide guidelines for organizations to collect relevant data from various sources, approaches to estimate emissions where data are missing, and procedures to ensure data quality and transparency.

Sources: ISF 2022; ISF and CPA Canada 2022; Kaplan and Ramanna 2022.

- **Climate-performance metrics should factor in various temporal perspectives, using policy milestones to ensure consistency, comparability, and tracking.** Climate science and literature provide estimates of remaining GHG budgets to reach the Paris Agreement temperature goal and highlight the need for early action. Climate-alignment assessment methodologies may take different temporal perspectives that can affect the environmental integrity of their assessments (Noels and Jachnik 2022). Methodologies can assess the climate alignment of corporate targets cumulatively or by specific dates. While cumulative emissions drive temperature outcomes, the years 2025, 2030, and 2050 are critical policy milestones. Having corporate targets at time frames that are of such short-, medium- (especially in the context of 5- to 10-year capital expenditure [capex] plans), and long-term duration (which shape short- and mid-term priorities, policies, and investment pipelines) is important for guiding corporate strategy and avoiding stranded assets. The choice of a time period during which alignment is assessed becomes even more important if methodologies compare a corporate target to a climate scenario at only one point in time. If methodologies are only assessing alignment in 2050, for example, corporate entities may allow for delayed action and carbon lock-in in the meantime, thereby causing the climate impacts and the crossing tipping points to be underestimated. Indeed, illustrative analysis has shown that alignment is more frequently achieved for methodologies that assess alignment only at a specific and distant point in the future (the year 2050, for example).
- **Alignment approaches should incorporate principles-based guidance that addresses just transition considerations as part of the assessment of a substantial contribution to climate-related objectives and the integration of transition considerations** (see Principle 6 and figure 15). This statement is based on an emerging consensus that was underscored in the Paris Agreement preamble, the G20 Leaders' Rome Declaration, and at the 26th and 27th annual United Nations Climate Change Conferences (COP26 and COP27, respectively). In the latest COP, the parties recognized “the need to ensure just transitions that promote sustainable development” (UNFCCC 2022, 9) and affirmed that “just and equitable transition encompasses pathways that include energy, socioeconomic, workforce and other dimensions, all of which must be based on nationally defined development priorities and include social protection so as to mitigate potential impacts associated with the transition.” According to the ILO, “A just transition involves maximizing the social and economic opportunities of climate and environmental action, while minimizing and carefully managing any challenges, including through effective social dialogue and stakeholder engagement and respect for fundamental labor principles and rights at work.”¹⁸ As emphasized by Robins et al. (2019, 9), “the centrality of the human in the just transition points to the importance for investors of using existing human rights frameworks to integrate the social dimension into their climate strategies.”

Incorporating just transition components involves managing change in carbon-intensive and hard-to-abate industries from a social and employment perspective (Dominish et al. 2019; Haverkamp and Sins 2021; ILO 2022; and Muller and Robins 2022). While not substituting for government-led policies on the just transition to address social and employment challenges related to climate change mitigation and adaptation (for example, job losses in some industries, extensive restructuring, declines in productivity, threats to poverty eradication, and so on), current and persistent gaps in aligning capital flows with just transition objectives justify an integration of these priorities in alignment approaches following initially limited market recognition of the need to address socioeconomic impacts of the decarbonization process (ILO 2022; Johansson 2023).

As emphasized by the IPCC, climate change mitigation, adaptation, and development pathways are closely linked. More specifically, “The development pathways taken by countries at all stages of economic development impact GHG emissions and hence shape mitigation challenges and opportunities, which vary across countries and

18 ILO, “What Is a Just Transition?,” Frequently Asked Questions on Just Transition, https://www.ilo.org/global/topics/green-jobs/WCMS_824102/lang-en/index.htm#:~:text=A%20Just%20Transition%20involves%20maximizing,fundamental%20labour%20principles%20and%20rights%20.

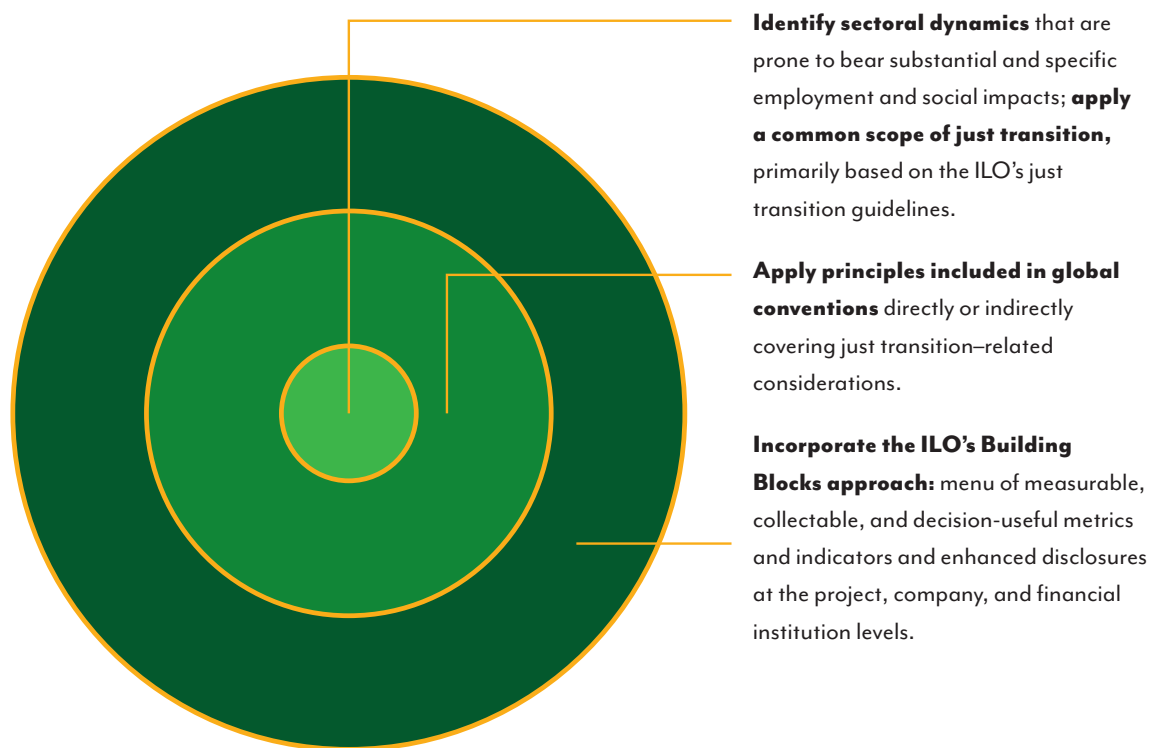
regions. Literature explores how development choices and the establishment of enabling conditions for action and support influence the feasibility and the cost of limiting emissions. Literature highlights that climate change mitigation action designed and conducted in the context of sustainable development, equity, and poverty eradication (Johansson, 2023), and rooted in the development aspirations of the societies within which they take place, will be more acceptable, durable and effective” (Skea et al. 2022, 4).

Yet, notable challenges include lack of consensus about definitions, limited standardization of social metrics, difficulties in obtaining relevant data, and the maturity of available processes focused on social parameters and the fact that social spending is most often seen as a cost rather than an investment (ILO 2022).

These challenges can be overcome by employing the following options:

- ◆ **Identify sectoral dynamics that are prone to bear substantial and specific employment and social impacts** by mapping, at the national and/or regional levels, job losses, gains, and reallocations and/or displacements across sectors that are included in the alignment approach (for example, energy sector, land transportation, waste management), as well as affected populations and most exposed population groups. Such an exercise may indeed favor capital allocation to support transition activities; allow financial market participants to factor in social and employment impacts in financial decision-making; and reinforce engagement with nonfinancial companies to effectively plan and implement just transition–aligned strategies (see figure 15).

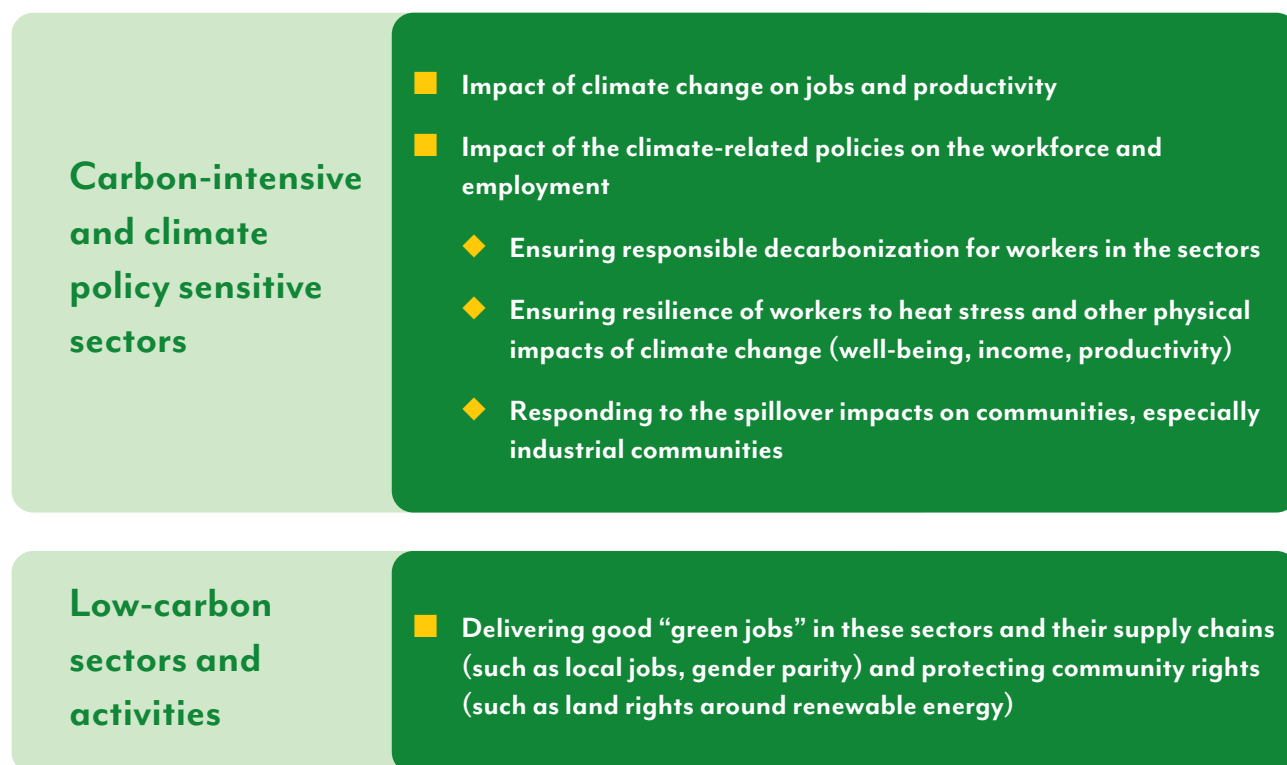
Figure 15: Methodological approach to incorporating just transition–related elements in alignment approaches



Source: Original figure for this publication.
 Note: ILO = International Labour Organization.

- ◆ **Apply a common scope of just transition, primarily based on the ILO’s just transition guidelines (ILO 2015).** These should include strong social consensus on the workforce and job-related consequences of climate change mitigation needs; respect and promotion of fundamental principles and rights at work; and deliberate attention to differential impacts between women’s and men’s needs to cut across just transition instruments.
- ◆ **Key principles included in global conventions that directly or indirectly cover just transition–related considerations should be fully or partly incorporated as part of the framework** (see Principle 2). These include the ILO Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy,¹⁹ the OECD Guidelines for Multinational Enterprises on Responsible Business Conduct,²⁰ the OECD Due Diligence Guidance for Responsible Business Conduct (OECD 2018), and the UN Guiding Principles on Business and Human Rights (OHCHR 2011). (See Principle 2.)
- ◆ **Incorporate the ILO’s Building Blocks Approach (ILO, 2022) into the alignment approach’s design and disclosure characteristics,** notably by compiling a menu of measurable, collectable, and decision-useful metrics and indicators that may differ across elements of corporate and financial decision-making; and enhance disclosures in project, company-level, and financial institutions’ reporting.

Figure 16: Aspects of a just transition depending on the carbon intensity of sectors



Source: Original figure for this publication based on Robins and Rydge 2019.

19 International Labour Organization, “What Is the ILO MNE Declaration?,” https://www.ilo.org/empent/areas/mne-declaration/WCMS_570332/lang-en/index.htm#:~:text=The%20Tripartite%20declaration%20of%20principles,responsible%20and%20sustainable%20workplace%20practices.

20 OECD, *Guidelines for Multinational Enterprises*, <https://www.oecd.org/corporate/mne/>.

Disclosures and Data

■ **A dual and complementary solution may be adopted to seek consistency across asset-level alignment approaches, from a statistical point of view, to ensure greater comparability.** This solution would consist of

- ◆ **The use of the same industrial classification system across all approaches or, at a minimum, the connection to the same industrial classification system for those asset-level alignment approaches that have already been adopted** (for example, in the context of a potential update of the underlying methodology or of a usability review). The reference to a common classification system would indeed allow investors and other financial market participants to compare asset-level alignment approaches using a commonly shared code.

ISIC is the United Nations' standard classification of *productive* activities that provides a set of activity categories and that can be utilized for the collection and presentation of statistics under such activities.²¹ According to the ISIC Revisions (Rev.) 4, activities that share a common process in producing goods or services and use similar technologies are grouped together. Accepted globally and considered the go-to international reference classification, ISIC, or a derivative, is used by a majority of countries around the world as their national activity classification. For example, the statistical classification of economic activities used in the EU, Nomenclature statistique des Activités économiques dans la Communauté européenne (NACE), is derived from ISIC. The Industrial Classification for National Economic Activities (ICNEA, 2017) of China also is derived from ISIC.

Despite its popularity, the current version of ISIC presents a twofold challenge regarding sustainable finance alignment approaches:

- ◆ **It does not fully consider activities related to climate change mitigation and conservation, management and restoration of ecosystems and biodiversity;** those related to electric cars (including manufacture, charging stations, and so on); and the classification of biofuels. In addition, potentially scalable technologies, such as hydrogen or carbon capture, utilization, and storage technologies, are not addressed in ISIC.
- ◆ **It is not sufficient to capture some nuances within activities, due to ISIC's perspective of productive activities,** which do not include environmental objectives. The actual production process and technology used plays a secondary role as a criterion for grouping activities at more aggregated levels. Therefore, while “Electric power generation, transmission and distribution” (UN 2008, 166) is the most granular level of detail available for electricity generation, it does not specify the type of fuel that is used, which impedes distinguishing renewable energy production (for example, electricity generation based on solar photovoltaic technology) from fossil fuel-based production. It also does not differentiate between electricity production, transmission, distribution, and trade.

Yet trade is a decisive issue, considering the value for asset-level alignment approaches to better understand, or even guide, allocation of financing between low-carbon and carbon-intensive technologies, especially in the energy sector, which is the largest emitting industry at the global level. Differentiating technologies used to produce electricity is a crucial objective for the development of low-carbon investment strategies and other objectives (that is, coal, oil, nuclear, solar, wind, biomass, and others).

21 At the most detailed level of classification, an industry consists of all the local activity units falling within a single class (four digits) of ISIC (and other classification systems) that are engaged in the same activity as defined in the ISIC. Industries comprise both local activity units, producing market goods and services, and local activity units, producing non-market goods and services. An industry consists of a group of local kinds of activity units engaged in the same type of productive activity, irrespective of whether or not the institutional units to which they belong produce market or non-market output.

- **Mapping between ISIC codes and other statistical classifications' codes** (most especially NACE, the North American Industry Classification System [NAICS], and the Global Industry Classification Standard) would ease international assessment. This would allow companies and financial market participants to assess alignment based on more than one classification system, although methodologies to assign units to sectors may vary, depending on the type of classification.

This option, complementary to the first point, would enable classification to go “beyond ISIC” in those situations where granularity is lacking in ISIC. Such mapping would allow following ISIC at the Section, Division, Group and Class levels (4 digits), while going beyond for some sectors (for example, the most granular level 4 NACE classes have 615 different classifications). For instance, the Climate Policy Relevant Sector methodology (developed in Battiston et al. 2022) uses NACE classifications to determine which sectors are most at risk to climate change.

Such an interoperability option comes with notable challenges, because the result may lead to less granular codes, thus modifying the value of the financial and climate-related metrics that are produced. Yet these other statistical classification codes present distinctive technical challenges for the usability of asset-level alignment approaches. Mitigation measure could include

- ◆ **Breaking down complex low-carbon technology projects into economic activities**, which might resolve complex and resource-intensive processes while decisive for disclosures and transparency at the instrument level.
- ◆ **Creating a code for each economic activity**, which would minimize difficulties that might take place where NACE (or other classifications) codes include multiple economic activities. In addition, some economic activities have no NACE codes.

The following options could be implemented to achieve these mitigation measures:

- ◆ **Adopt the concept of “lead activity (or activities)”** when designing an asset-level alignment approach, which would allow greater flexibility in the assessment of the climate-related alignment of an instrument, project, or both.
 - ◆ **Identify “private sector-led” initiatives** for specific asset classes (most notably, infrastructure), including the Sustainability Accounting Standards Board’s (SASB) Sustainable Industry Classification System and the EDHEC-Risk Climate Impact Institute’s The Infrastructure Company Classification Standard (TICCS).
- **More broadly, it is important that ISIC, in the near future, specifically identify climate and environmentally relevant activities**, either by making them explicit in the explanatory notes of existing classes or by creating separate classes considered relevant during the development of the class-level classification. This is because ISIC’s Rev. 4 has not led to revisions at the division and group levels along the abovementioned lines (that is, coverage in climate and environmental critical activities or granularity for key climate-related sectors) while recognizing the importance of these activities. Further experimentation and testing in countries where asset-level alignment approaches have been (or are being) developed would be helpful as well.

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PRINCIPLE

2

Avoid negative contributions to other sustainability goals

(such as by doing no significant harm to any sustainability goal requirements).

- A. Operational Challenges**
- B. Key Takeaways from Technical and Comparative Analysis**
- C. Methodological Suggestions to Apply the Principle**

Approaches to aligning sustainable investments should avoid negative contributions to other sustainability goals and should provide guidance in terms of accounting for secondary effects, which could include a requirement to do no significant harm to any of the 17 SDGs despite a positive contribution to one or more SDGs. For example, in the case of a sustainable finance taxonomy, projects that increase the availability of clean water but generate an increase in greenhouse gas emissions that undermines national commitments to an alignment with the Paris Agreement or projects that are implemented in a way that benefits some groups but negatively affects human rights for other groups, should not be included. To the extent that an alignment approach involves a process for implementation, it should also introduce safeguards to ensure that a positive contribution to one objective is not going to be outweighed by negative effects on other environmental and social objectives. In this principle, the “do no significant harm” approach and so-called minimum safeguards are envisioned as complementary but may vary in application and scope.

This principle is aligned with the rationale explained in Pillar 5, “Assessing and Mitigating Negative Social and Economic Impact of Transition Activities and Investments,” of the 2022 G-20 Sustainable Finance Report. Under Pillar 5 of that report (G-20 SFWG 2022, 40), Principle 20 encourages fundraisers to “assess and mitigate potential impacts of their transition plans or other strategies. In setting eligibility criteria and reporting frameworks for transition activities, authorities or financial institutions (FIs), where consistent with domestic mandates and local laws and regulations, should encourage the fundraiser (the company) to assess the potential socioeconomical implications of its transition plan, to be transparent about these implications and measures taken to mitigate negative impacts or highlight potential net positive impacts.”

A. OPERATIONAL CHALLENGES

Design of the Sustainable Finance Alignment Approach

- **Defining “significant harm”** depends on the selection of the core objectives that are seen as desirable (or not) for the alignment approach and whether harm to those objectives is determined in quantitative and/or qualitative terms (Gupta and Schmeier 2020). Several options may prevail, such as a threshold-based approach to assess significance or a principle- or rule-based approach. When linked to disclosure, the definition of “significant harm” may be determined by what is considered “material” to those who are using the disclosed information. “Single” materiality focuses on the impact of sustainability factors on the disclosing entity and its outlook, while “double” materiality also includes a company’s own impact on environmental and social sustainability, such as the climate, nature, and society. A threshold-based approach can raise challenges if it requires defined thresholds that can apply across jurisdictions and sectors. Alternatively, “significant” can be defined through a materiality approach, which relies on some judgment by the company and/or issuer. This would be in line with existing approaches, including the sustainability disclosure standards (IFRS S1 General Requirements for Disclosure of Sustainability-Related Financial Information and IFRS S2 Climate-Related Disclosures), published in June 2023 by the International Sustainability Standards Board (ISSB).
- **Applying significant harm at the entity level can be complex** when the alignment approach focuses at the activity level, as is the case with most taxonomies. Assessing and managing harm at the entity level raises issues of environmental integrity, such as how to assess alignment if another objective is significantly harmed, and it raises practical challenges, such as how to assess subsidiaries and supply chains.
- **Adopting a materiality approach in defining and assessing significant harm** broadens the risk management approach to cover all types of risks to society and the environment and requires a materiality exercise to identify and prioritize risks that need to be addressed.

Defining “materiality” in this context is critical, even though there are well-established practices in this regard under various frameworks, which are then further incorporated into assurance standards (for example, ISAE 3000).²² Risk tests are handled differently from sustainability-related disclosures. For example, the ICMA guidelines for external review of sustainability issuances state that external reviewers should assess, among other things, the “potentially material environmental and/or social risks associated with the projects (where relevant)” (ICMA 2022, 5).

- **Selecting an absolute or partial lens of assessment of significant harm and whether the approach can leverage risk management requirements of an existing market standard** has resource implications for practical implementation and whether entities need to fully comply at a certain point in time or address gaps over a period with a credible action plan.
- **Strengthening corporate governance**, and including governance of sustainability risk management, in line with existing good practices. Note that IFC has recently updated its corporate governance methodology to better reflect the governance of sustainability risk management. Governance of climate risk is also covered in the OECD draft paper on “Managing Climate Risks and Impacts through Due Diligence for Responsible Business Conduct.”
- **Existing good practice standards can also be used to guide the governance of sustainability risk management.** For example, the recently revised G-20/OECD Principles of Corporate Governance (OECD 2023b) includes a new chapter and recommendations on “Sustainability and Resilience,” and IFC (2023) has recently updated its corporate governance methodology to better reflect governance of sustainability risk management. The IFC methodology was originally structured on the G-20/OECD Principles, so its update could consider the relevant revisions to the Principles. Governance of climate risk is also covered in the OECD draft paper, “Managing Climate Risks and Impacts through Due Diligence for Responsible Business Conduct.”
- **Adapting the definition and assessment of significant harm for alignment approaches to embrace a diversity of sustainability-related objectives** raises issues because those criteria may be incorporated into the alignment approach from a qualitative perspective (for example, minimum social and governance criteria for sectors during decarbonization, and vice versa, depending on the primary lens chosen in the alignment approach’s criteria setting).
- **Adapting the assessment of significant harm for a variety of asset classes introduces complexities**, given the different types of relationships between financial market participants, assets, and entities (for example, companies, activities, and projects), with different levels of impact and investment strategies.

22 See IAASB (International Auditing and Assurance Standards Board), “ISAE 3000 (Revised), Assurance Engagements Other than Audits or Reviews of Historical Financial Information: International Framework for Assurance Engagements and Related Conforming Amendments” (Final Pronouncement, December 2013), https://www.ifac.org/_flysystem/azure-private/publications/files/ISAE%203000%20Revised%20-%20for%20IAASB.pdf. The International Standard on Assurance Engagements (ISAE) 3000 standard covers assurance engagements other than audits or reviews of historical financial information. It is therefore applicable to sustainability-related disclosure. The standard requires the assurance professional to assess materiality in the following ways: “The practitioner shall consider materiality when: (a) Planning and performing the assurance engagement, including when determining the nature, timing and extent of procedures; and (b) Evaluating whether the subject matter information is free from material misstatement” (15); “Identification of intended users and their information needs, and consideration of materiality and the components of engagement risk” (44); and “Professional judgments about materiality are made in light of surrounding circumstances, but are not affected by the level of assurance, that is, for the same intended users and purpose, materiality for a reasonable assurance engagement is the same as for a limited assurance engagement because materiality is based on the information needs of intended users” (45).

Disclosures and Data (in relation to Principle 4)

- **Adapting disclosures according to the static or dynamic nature of the significant harm criteria.** For example, if defined dynamically, issues arise as to how to perform the assessment and how to verify it over time. In this scenario, issues relate to the link between criteria setting and the usability of the alignment approach (for example, ex ante and ex post requirements for alignment assessment). Moreover, depending on the quantitative or qualitative nature of the “significant harm” criteria, ensuring consistent data reporting is an additional issue. These technical issues add up to the ones detailed under Principle 3, with regard to the adjustments reflecting changes in policies, technologies, and state of the transition: despite their differences, the operational integration of such changes in “do no significant harm” criteria into disclosures and into the alignment of sustainable instruments constitutes a key challenge—for usability and reliability purposes.
- **Ensuring adequate verification, auditing, or both is particularly challenging at a national level when requiring audit firms and verifiers to adjust to the nuances of a national alignment approach.** This risk is partially addressed by minimum auditing standards, or by allowing for a minimum level of assurance amid the verification of this principle (for example, assurance and auditing standards, as those found in ISAE 3000). This verification is key considering the growing role of ESG rating providers in developing taxonomy-aligned products involving an assessment of “do no significant harm” that is often based on controversy screening or backward-looking information.

B. KEY TAKEAWAYS FROM TECHNICAL AND COMPARATIVE ANALYSIS

The comparative analytical work shows the following:

- **While the general principle of “do no significant harm” (DNSH) is integrated into most taxonomies, there are significant divergences in its concretization, including whether it aims at qualifying all sectors, activities, or assets, or only transitional activities.** These differences often stem from the location and context-specific nature of activities that interact directly/indirectly with their surrounding environment, therefore causing potential harm: taxonomies may embed these nuances in a more or less specific way.

For example, a minority of frameworks apply concepts of “minimum social safeguards” (MSS), DNSH, or both. Those frameworks include ones adopted or drafted by Bangladesh, Chile, China, Colombia, the European Union, Indonesia, Mongolia, and South Africa. MSS and DNSH requirements often leverage international standards, while social eligibility standards find their place in a few taxonomies (usually those that are private sector based). Most often, they incorporate specific thresholds, as well as processes and/or measures to undertake.

Some countries apply strict interactions with specific local laws and regulations in this area (for example, labor laws, child protection regulations), and a few countries apply a significant harm criterion to governance-related considerations. The ASEAN and Malaysian taxonomies use the concept of “remedial efforts” for those activities that are transitioning. These efforts relate to actions that anticipate and avoid risks and impacts at the outset, or at the very least minimize or reduce risks and impacts to acceptable levels. The Malaysian taxonomy incorporates a clear-cut series of risk acceptance criteria for informed decision-making purposes, particularly in assessing whether the economic activity and overall business are at risk of causing significant harm to the environment (that is, sector- and industry-

related criteria, such as the intensity of the business’s GHG emissions in comparison with the industry’s average; the purpose and possible impact of loan, financing, and investment criteria for GHG emissions or climate resilience; and business profile–related criteria, such as the adoption of sustainable practices by the business’s vendors).

When it comes to practical implementation, MSS and DNSH technical guidance often aligns substantially with established ESG risk management frameworks used by the financial sector that are gaining traction across advanced economies as well as in EMDEs (see table 4).

Table 4: Assessment of Principle 2–like elements in current asset-level approaches (mainly taxonomies and similar classifications)

	Mechanism to prevent specific harm to other taxonomy objectives	Mechanism to ensure minimum environmental, social, and/or governance standards
Bangladesh	Yes	Minimum social and governance standards
Brazil	Yes, for transitional activities	No
China	No	Safety, environmental protection, and quality regulations
Colombia	DNSH	Compliance requirements to ensure no negative impact on social issues
European Union	DNSH	Compliance requirements with international conventions on human rights, labor, and governance
Indonesia	Yes, for transitional activities	No
Malaysia	No	Compliance requirements with labor and child protection laws
Mongolia	No	Minimum environmental and social risk management regulations and standards
South Africa	DNSH	Minimum social safeguards around labor, health and safety, and human rights

Sources: Research by the Sustainable Banking and Finance Network (SBFN) Sustainable Finance Instruments Working Group; research by study team. Note: DNSH = do no significant harm.

- It is also important to note that several principles have been progressively emerging as a complementary set of risk management steps (see table 5).

Table 5: Assessment of current principles to mitigate potential negative social and economic outcomes in asset-level alignment approaches

Principle	Description	Use examples
DNSH	<p>In its precise usage, this principle is specific to the context of taxonomies and is aimed at ensuring that activities that meet one taxonomy objective are considered eligible only if they do not harm any of the other objectives.</p> <p>In its strictest use, DNSH will be contextualized by the specific objectives included in a taxonomy.</p> <p>However, DNSH builds on a foundation of risk management requirements across different sustainable finance frameworks.</p>	<p>The ICMA Green Bond Principles state that issuers should clearly communicate to investors “complementary information on processes by which the issuer identifies and manages perceived social and environmental risks associated with the relevant project(s)” and encourage issuers to “have a process in place to identify mitigants to known material risks of negative social and/or environmental impacts from the relevant project(s). Such mitigants may include clear and relevant trade-off analysis undertaken and monitoring required where the issuer assesses the potential risks to be meaningful” (ICMA 2021, 5).</p> <p>Similarly, the Operating Principles for Impact Management include a principle (Principle 5) that requires impact investors to “assess, address, monitor, and manage potential negative impacts of each investment” (IFC 2019). Many users have therefore already started to view DNSH more broadly as a risk management principle that aligns with established risk management practices. In fact, the term “do no harm” is often used in relation to such safeguards, many of which reference the IFC Performance Standards as a foundation.</p>

Continue on the next page

Principle	Description	Use examples
<p>ESG safeguards</p>	<p>Safeguards refer to minimum performance standards that must be met to ensure that environmental, social, and governance risks and impacts related to an activity are adequately identified, assessed, and mitigated. These safeguards can be established by referencing specific international frameworks or conventions.</p> <p>Safeguards related to environmental and social performance are widely used as a general approach to sustainability risk management; they often include minimum performance expectations as well as guidance on good practices.</p> <p>ESG covers the broad spectrum of environmental, social, and governance standards and safeguards that are now well established across the financial system and all asset classes.</p>	<p>IFC's Performance Standards (2021) and Equator Principles (IFC and Equator Principles Association 2023) are the most widely used by the financial sector.</p> <p>Frameworks to assess the corporate governance practices of entities receiving finance have also emerged in parallel, and there is increasing interconnection between E, S, and G.</p> <p>For example, the Task Force on Climate-Related Financial Disclosures (2017) raised the importance of the role of the board and executives in terms of governance oversight of climate change risks and opportunities.</p> <p>In a taxonomy context, safeguards are added to complement the DNSH principle, which may be limited to the specific objectives of the taxonomy. For instance, a green finance taxonomy will have environmental objectives; therefore additional social safeguards are needed. Similarly, a social taxonomy might have social objectives to which DNSH applies and might need additional environmental and/or governance safeguards.</p> <p>In the context of taxonomies, safeguard requirements represent a complementary layer of risk management, as they consider an activity's ESG risks and impacts more broadly than just through the lens of a taxonomy's sustainability objectives (as opposed to DNSH, which is directly linked to the chosen objectives). In other sustainable finance instrument systems, DNSH and safeguards can be considered in a joint fashion to encompass ESG risk management good practice, including ESG management systems, due diligence, action plans, monitoring, disclosure, and engagement between investors and investee companies.</p>
<p>Technical criteria</p>	<p>Technical criteria are specific performance criteria that must be met for a specific activity to be considered eligible under a given taxonomy. Technical criteria are often specific to sectors and jurisdictions.</p>	<p>The World Bank's general and sector-specific Environmental, Health, and Safety Guidelines (World Bank 2007) are an example of a similar level of technical depth.</p>

Source: Original table for this publication.

Note: DNSH = do no significant harm; ESG = environmental, social, and governance; ICMA = International Capital Market Association; IFC = International Finance Corporation.

■ **The financial sector’s rapid uptake of these concepts reflects, in part, the success of more established practices of ESG management** that have evolved over several decades:

- ◆ **The UN-backed Principles for Responsible Investment, Principles for Sustainable Insurance, and Principles for Responsible Banking**²³ contain a commitment by signatories to consider and manage environmental and social risks. However, no minimum standards or thresholds are indicated to determine unacceptable risks or a minimum level of positive impact.
- ◆ **The IFC Performance Standards**²⁴ have established a gold standard for managing environmental and social risk in emerging markets and have been widely adopted as market standards and embedded in operational policies by corporations, investors, financial intermediaries, stock exchanges, regulators, and countries. Projects must meet minimum environmental and social standards and they are expected to put in place governance and systems to assess and manage environmental and social risks. From a risk management perspective, these standards are particularly valuable in the context of project and asset finance.
- ◆ **The World Bank’s Environmental, Health, and Safety (EHS) Guidelines** complement the IFC’s Performance Standards. They are technical reference documents with general and industry-specific examples of good international industry practice (GIIP) that contain generally acceptable performance levels and measures. Similarly, the IFC’s Corporate Governance Methodology, which is used widely by other development finance institutions, sets out expectations for good corporate governance, which include management of sustainability (environmental and social) aspects, in line with the IFC’s Performance Standards and evolving requirements of corporate governance codes globally. The revised G-20/OECD Principles of Corporate Governance and their new recommendations on sustainability, including sustainability-related disclosure, are also relevant in this regard.
- ◆ **The OECD Guidelines for Multinational Enterprises on Responsible Business Conduct** (OECD 2023a) (the MNE Guidelines) and associated *OECD Due Diligence Guidance for Responsible Business Conduct* (OECD 2018) are the most comprehensive international instruments on responsible business conduct (RBC) and they are a leading authoritative standard on RBC due diligence. The MNE Guidelines are supported by practical guidance on how business can conduct due diligence (that is, the OECD Due Diligence Guidance for Responsible Business Conduct), as well as sector-focused guidance (related to minerals, extractives, agriculture, finance, and garment and footwear). When applied to investors, the OECD due diligence framework differs from other ESG risk management systems (such as the IFC Performance Standards) because it provides expectations addressed directly to financial institutions, rather than to the client receiving financing. The OECD has further developed tailored guidance to suit specific investors and transactions (institutional investors, corporate lending and securities underwriting, and project and asset finance).
- ◆ **The Equator Principles** are a risk management framework adopted by financial institutions to determine, assess, and manage environmental and social risk in the projects they finance. The principles have adopted the IFC’s Performance Standards, the World Bank’s EHS Guidelines, and the UN Guiding Principles on Business and Human Rights as their technical basis and sectoral good practices.

23 Principles for Responsible Investment, “What Are the Principles for Responsible Investment,” <https://www.unpri.org/about-us/what-are-the-principles-for-responsible-investment>; United Nations Environment Programme, “Principles for Sustainable Insurance—About,” <https://www.unepfi.org/insurance/insurance/>; United Nations Environment Programme, “Principles for Sustainable Banking—About,” <https://www.unepfi.org/banking/bankingprinciples/>.

24 IFC (International Finance Corporation), IFC Performance Standards, https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/Performance-Standards/.

◆ **The European Union’s Sustainable Finance Taxonomy Regulation²⁵** sets an expectation that taxonomy-aligned activities at a minimum make a substantial contribution to identified environmental objectives and do not harm others. Such activities should also be governed by minimum safeguards (social standards). The EU Taxonomy operates in conjunction with other EU regulations and disclosure requirements that set expectations for ESG due diligence, risk management, and disclosure (Maples Group, ELS Europe, and FS-UNEP Collaborating Centre for Climate and Sustainable Energy Finance 2021).

■ **Observed trends in due diligence approaches to risk management are also worth noting.** In recent years, policy makers’ actions to embed risk-based due diligence into policies have accelerated on various fronts. Governments have opted to do so through a smart mix of measures, including increasingly through laws and regulations that require companies to undertake due diligence on human rights and environmental risks and effects on their operations and supply chains. These regulations vary in terms of goals, scope, expectations, and oversight mechanisms, which are a reflection of the different domestic policy priorities, processes, and other factors. Among these regulations are the following:

◆ **The French 2017 Duty of Vigilance Law²⁶**, which requires large companies to publish and implement a due diligence plan that sets out a company approach to assessing environmental and human rights risks posed by companies’ own activities, activities of companies they control, and activities of suppliers or contractors with which they have established business relationships. More recently, the Netherlands, Norway, and Germany also adopted similar regulations requiring large companies to conduct supply chain due diligence.

◆ **On February 23, 2022, the European Commission (EC) adopted a proposal for a directive on corporate sustainability due diligence.** The aim of this directive is to foster sustainable and responsible corporate behavior and to anchor human rights and environmental considerations in companies’ operations and corporate governance. The EC proposal recognizes the agricultural sector as a high-risk sector. The European Council has since adopted its own position on the directive, and the European Parliament voted on June 1, 2023, to adopt due diligence requirements that address specific risks²⁷ (for example, the United Kingdom’s 2015 and Australia’s 2018 Modern Slavery Acts²⁸ and Switzerland’s 2021 Ordinance on Due Diligence and Transparency in relation to Minerals and Metals from Conflict-Affected Areas and Child Labor²⁹), as well as other due diligence requirements for specific commodities or products (for example, the EU’s conflict minerals regulation;³⁰ the European Commission’s proposed regulation on deforestation-free products,³¹ and its battery regulation;³² and the US Dodd-Frank Act, which requires disclosure of use of conflict minerals).³³

25 European Commission, “EU Taxonomy for Sustainable Activities: What the EU Is Doing to Create an EU-wide Classification System for Sustainable Activities,” https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en#eu-taxonomy-navigator.

26 France’s Duty of Vigilance Law, <https://www.business-humanrights.org/en/big-issues/corporate-legal-accountability/frances-duty-of-vigilance-law/>.

27 European Commission, “Corporate Sustainability Due Diligence,” https://commission.europa.eu/business-economy-euro/doing-business-eu/corporate-sustainability-due-diligence_en#:~:text=On%2023%20February%202022%2C%20the,companies%27%20operations%20and%20corporate%20governance.

28 UK Modern Slavery Act 2015, <https://www.legislation.gov.uk/ukpga/2015/30/contents/enacted>; Australia Modern Slavery Act 2018, <https://www.legislation.gov.au/Details/C2018A00153>.

29 Federal Council of Switzerland, “Ordinance on Due Diligence and Transparency in Relation to Minerals and Metals from Conflict-Affected Areas and Child Labour” [unofficial English version], <https://www.fedlex.admin.ch/eli/cc/2021/847/en>.

30 Regulation (EU) 2017/821 of the European Parliament and of the Council of 17 May 2017 laying down supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high risk areas, Official Journal of the European Union, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R0821&from=EN>.

31 European Commission, “Proposal for a Regulation on Deforestation-Free Products,” 2021, https://environment.ec.europa.eu/publications/proposal-regulation-deforestation-free-products_en.

32 European Commission, “Proposal for a Regulation of the European Parliament and of the Council concerning batteries and waste batteries, repealing Directive 2006/66/EC and amending Regulation (EU) No 2019/1020,” [https://www.europarl.europa.eu/RegData/docs_autres_institutions/commission_europeenne/com/2020/0798/COM_COM\(2020\)0798_EN.pdf](https://www.europarl.europa.eu/RegData/docs_autres_institutions/commission_europeenne/com/2020/0798/COM_COM(2020)0798_EN.pdf).

33 US Securities and Exchange Commission, “Fact Sheet: Disclosing the Use of Conflict Materials, modified March 14, 2017,” <https://www.sec.gov/opa/Article/2012-2012-163htm---related-materials.html>.

- **Mandatory expectations related to risk-based due diligence are further reflected in several policy areas pertaining to risk management, sustainability disclosure, corporate governance, sustainable finance, trade, and investment or public procurement.** Under these instruments, the due diligence process is either encouraged or incentivized through “comply or explain” disclosure requirements or as a means of demonstrating compliance with other legal requirements (that is, modern slavery statements, import bans, minimum safeguards, or principal adverse impacts disclosure).

Only a few taxonomies exclude sectors from the outset on the basis of their significant harm to climate or environment-related objectives, which illustrates key differences across taxonomies on understanding and characterizing “significant harm.” The European Union and Russian taxonomies exclude the production of solid fossil fuels (that is, thermal coal and lignite), while the Bangladesh taxonomy excludes illegal deforestation, illegal waste management, and use of fire for land clearance, agriculture, and urbanization. The Malaysian taxonomy excludes illegal deforestation use for fire for land clearance or agriculture forestry in protected areas, illegal waste management, and the release of untreated toxic, hazardous industrial waste and substances. The Mongolian taxonomy excludes the use of unprocessed coal (except for thermal power plants in the capital city).

C. METHODOLOGICAL SUGGESTIONS TO APPLY THE PRINCIPLE

Design of the Sustainable Finance Alignment Approach

This paper proposes that using already-established standards and frameworks is helpful when it comes to implementing the risk management and due diligence requirements of alignment approaches, rather than creating new methods. Such an approach will leverage existing management systems and data collection within financial institutions and companies operating in both developed countries and emerging markets, thereby minimizing the costs of adopting new frameworks and requirements. An example of such analysis is the joint research by IFC and the Equator Principles Association titled *Promoting Interoperability across Environmental and Social Risk Management Frameworks*, published in May 2023, which explores linkages and provides practical comparisons between the EU Taxonomy’s DNSH and minimum safeguards requirements, and the IFC Performance Standards and World Bank EHS Guidelines. In so doing, other practical challenges can be addressed, such as the application of DNSH and safeguards in different asset classes, sectors, and jurisdictions, as well as efficient monitoring, verification, and disclosure.

- **Criteria should be adjusted on the basis of the level of influence and types of engagement by regulators and investors, respectively, in relation to different asset classes.** Table 6 provides indicative examples.

Table 6: Application across asset classes

Asset class	Influence of finance provider
Corporate lending	<ul style="list-style-type: none"> ■ Lending institution may require compliance of finance recipient with detailed ESG performance criteria. ■ Compliance with ESG safeguards may be a requirement of disbursement. ■ Covenants may be included in the loan agreement to enable the finance provider to recall its loan if noncompliance occurs. ■ The loan recipient may be required to provide annual or quarterly reporting data.
Listed equities	<ul style="list-style-type: none"> ■ Listed companies must comply with reporting criteria in company regulations, corporate governance codes, and stock exchange listing instructions. ■ Investors may engage actively with investee companies to improve ESG performance and disclosure, without being guaranteed to achieve the desired influence over the investee company. ■ Investors may choose to divest if ESG performance and disclosure are not as anticipated. ■ Asset managers may select or deselect listed companies from portfolios based on mandates from their clients (including institutional investors) or in accordance with the developed (and potentially labeled) investment products. ■ Asset managers and institutional investors may be required by regulators to disclose how they have embedded ESG risk management criteria in their selection and engagement with listed companies.
Bonds	<ul style="list-style-type: none"> ■ Issuers must comply with frameworks that govern the issuance of green, social, and other types of sustainability focused bonds (for example, the ICMA GSS Bond Guidelines) and/or stock exchange listing instructions. ■ Compliance is more strongly assessed at the issuance stage and often requires a second-party opinion. ■ There is less of a focus on monitoring and reporting on ESG risks and impacts through the life of the bond, although this may change as civil society scrutiny grows in relation to use of proceeds.
Private equity	<ul style="list-style-type: none"> ■ Private equity fund managers may increasingly require investee companies to comply with stringent ESG due diligence requirements before investment. ESG action plans may also be embedded in the investment agreement and monitored over time. ■ The Operating Principles for Impact Management and similar frameworks increasingly offer a voluntary way to monitor compliance of private equity funds with good practice in ESG and impact management. ■ Private equity fund managers must also comply with ESG-related disclosure regulations for asset managers, such as the SFDR in the EU.

Source: Original table for this publication.

Note: ESG = environmental, social, and governance; EU = European Union; GSS = Green, Social, and Sustainability; ICMA = International Capital Market Association; SFDR = Sustainable Finance Disclosure Regulation.

- A two-tiered approach is recommended for implementing Principle 2 (figure 17).

Figure 17: Methodological suggestions to apply Principle 2



Source: Original figure for this publication.

Notes: IFC = International Finance Corporation; OECD = Organisation for Economic Co-operation and Development.

◆ ***At a minimum, the framework should ensure compliance with the following:***

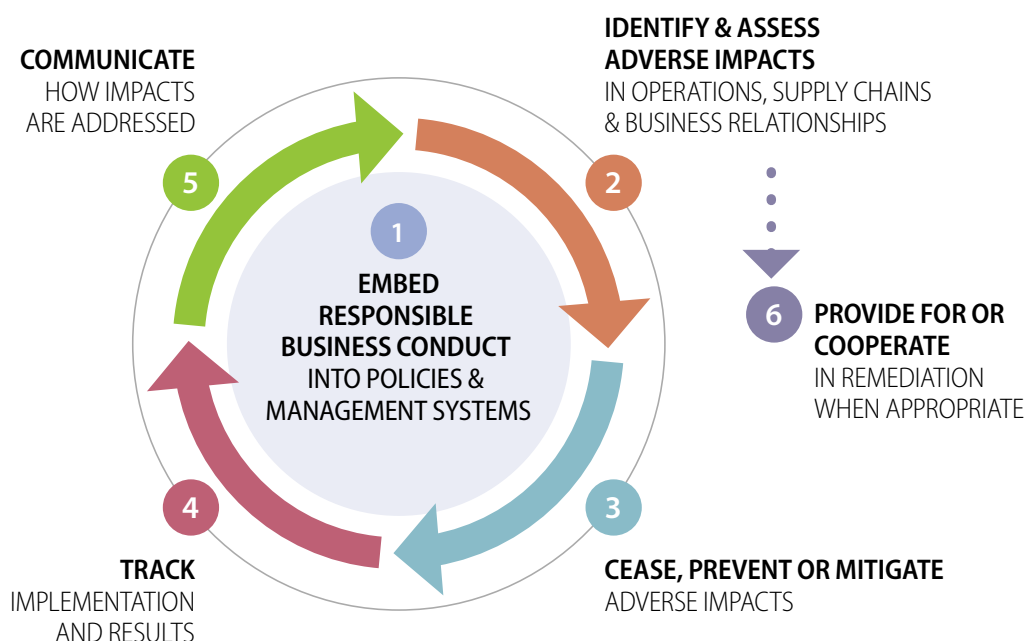
- **National environmental and social regulations and laws applicable to the sector, location, and activity.**
- **Relevant international conventions to which the jurisdiction is a signatory**, such as on labor and human rights (for example, ILO Declaration on Fundamental Principles and Rights at Work and the International Bill of Human Rights³⁴) and those that are directly related to the preservation of the environment (that is, the Convention on Biological Diversity, the Montreal Protocol on Substances That Deplete the Ozone Layer, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, the Stockholm Convention on Persistent Organic Pollutants, and other international conventions). Explicit reference to conventions in alignment approaches may facilitate interoperability and international investor due diligence.

34 In December 1948, the United Nations General Assembly adopted the Universal Declaration of Human Rights (UDHR). In December 1966, the UN General Assembly adopted two international treaties: the International Covenant on Economic, Social and Cultural Rights and the International Covenant on Civil and Political Rights. Together, the UDHR and the two covenants are known as the International Bill of Human Rights. See Battiston and Monasterolo (2021); de Gaye and Lisack (2022); and ESRB (2016).

- ◆ Optionally, the framework can propose
 - **A well-defined risk management approach** (such as an environmental and social risk management system approach or a due diligence and monitoring approach—for example, the IFC Performance Standards or those adapted from the IFC Performance Standards such as the Equator Principles and OECD Common Approaches), as well as the disclosure standard released by the International Sustainability Standards Board (2023) for managing material sustainability risks and opportunities, and
 - **An indicative set of environmental and social performance topics** (that is, reflecting global consensus demonstrated by ESG risk management standards, sustainability disclosure good practice, and the SDGs). Typical topic areas include, but are not limited to, the following:
 - **Environmental**, including climate change mitigation and physical risks, water and oceans, effluents and waste management, energy, clean air, biodiversity, resource use (circular economy), and supplier environmental assessment
 - **Social**, including human rights and use of security forces, labor practices, occupational health and safety, community health and safety, climate change adaptation and resilience, land use and resettlement, gender, rights of indigenous peoples, cultural heritage, customer health and safety, customer privacy and data protection, supplier social assessment, and external and internal grievance mechanisms
 - **Governance**, including board structure and diversity; ethics, anticorruption, and anti-money-laundering; whistleblower protection; transparency; accounting practices; anticompetitive behavior; and protection of minority shareholder rights
- ◆ The implementation of a broader Responsible Business Conduct due diligence should provide an anchor framework to cover supply chains beyond companies' own operations.
- **The DNSH Principle, IFC Performance Standards, and the RBC due diligence framework set the expectation that businesses (including investors) will avoid and address the adverse effects of their operations (or economic activities), including when they occur in their supply chains and business relationships.** In addition, the OECD MNE Guidelines are recommendations addressed by governments to multinational enterprises operating in or from adhering countries. The guidelines provide principles and standards for responsible business conduct in a global context consistent with applicable laws and internationally recognized standards. The MNE Guidelines are the only multilaterally agreed-on and comprehensive code of responsible business conduct that governments have committed to promoting. The OECD's Due Diligence Guidance for Responsible Business Conduct provides guidance to multinational enterprises on how to carry out ongoing risk-based due diligence to identify, prevent, mitigate, and account for how they address potential and actual adverse effects on their own operations, their supply chains, and other business relationships. It covers human rights, employment and industrial relations, the environment, combating bribery, protection of consumer interests, technology transfer, competition, and taxation. Importantly, it makes companies responsible for assessing and managing environmental and social risks that they may cause, contribute to, or be directly linked to, including in their supply chains.

There are six steps in the due diligence process to assess alignment with the RBC framework (see figure 18).

Figure 18: Steps in the Responsible Business Conduct framework



Source: OECD 2018, 21.

These six steps can be particularly relevant in assessing the contribution of businesses and the financial sector to GHG emissions and emissions reductions from corporate operations and across the supply chain. The recent update of the MNE Guidelines provides a clear definition of business adverse impacts on climate change: an adverse climate impact is characterized by an activity (a) that is contributing to or directly linked to GHG emissions or impacts on carbon sinks in a way that is not consistent with internationally agreed global temperature goals based on best available science, including as assessed by the IPCC or (b) that undermines climate adaptation for, or the resilience of, communities, workers, and ecosystems.

The risk-based and whole-of-supply-chain approaches of the RBC due diligence framework can provide valuable lessons to a net-zero framework. The risk-based approach seeks to make due diligence practicable by giving enterprises flexibility—within specific parameters—to scale and tailor their approaches to the specific context and circumstances. Such parameters include their size, sector, the context of their operations and business model, their position in supply chains, and the nature of their products and services. When applied to net-zero and Paris Agreement alignment frameworks, this proportionate and commensurate approach ensures that companies direct their time and resources toward the most pressing issues (that is, high-emitting activities and business relationships) (figure 18).

Applying this due diligence would therefore aim at achieving the following objectives:

- **Addressing actual and potential significant adverse impacts** related to environmental (including climate), social (including human rights and labor rights), and governance risks
- **Avoiding reputational risks**, given that investors that do not consider adverse climate impacts to society and the environment in the context of their investment decisions and portfolios may risk suffering reputational damage and business losses
- **Avoiding market risks**, given that the effects of greenwashing could undermine the broader market for sustainable investing and lower the perceived value of these instruments
- **Avoiding current risks**, given that when adverse climate risks are severe, they may be financially material; likewise, strong RBC practices are often correlated with stronger financial performance (Friede, Busch, and Bassen 2015)
- **Supporting an orderly transition**, given that insufficient action from public and private actors to mitigate climate change increases the risks of a disorderly low-carbon transition or of not achieving a low-carbon transition altogether. A disorderly transition increases the risks of “stranded assets” and broader transition costs from stringent, delayed mitigation action.³⁵ A disorderly transition also increases physical risks for investors, including costs that are a result of insufficient or delayed mitigation action, and raises the risk of adverse effects on society and the environment. Failure to identify and avoid or minimize material ESG risks related to sustainability-focused financial instruments can also compromise the low-carbon transition and other green and inclusive economy strategies by, for example, (a) excluding vulnerable groups, (b) undermining ecosystem resilience and related adaptation services, or (c) contributing to conflict and/or financial instability. Of note is the role of inclusive green finance, where alignment approaches should not exclude key segments of the economy, such as SMEs, women, households, and vulnerable groups, from participating in the transition to a low-carbon and green economy, and should not result in increased financial exclusion (UNSGSA 2023).

³⁵ See Battiston and Monasterolo (2021); de Gays and Lisack (2022); and ESRB (2016).

Disclosures and Data

- **Applying a general ESG risk management approach would ensure alignment with existing disclosure frameworks that address risks and impacts on the environment and society.** As mentioned, sustainable investments should be underpinned by a foundation of ESG risk management to avoid negative contributions to other sustainability goals. Such a risk management approach serves to (a) reduce investment risk, (b) prevent greenwashing, and (c) prevent unintended or secondary negative impacts on society and the environment.
- **In addition, to the extent that an alignment approach involves a process for implementation, frameworks can also require adherence to social and environmental safeguards.** Investments that are not fully aligned can commit to a credible environmental and social action plan and disclosure to achieve alignment over time. This commitment will amplify the long-term positive effects and reduce the risks of sustainable investments overall.

Therefore, it is recommended to base transparency on risk management on a global standard, such as the sustainability disclosure standards (IFRS S1 General Requirements for Disclosure of Sustainability-Related Financial Information and IFRS S2 Climate-Related Disclosures), published in June 2023 by the ISSB (ISSB 2023a, 2023b). The ISSB constitutes an example of the core “management approach” dimensions for managing *material* sustainability risks and opportunities. The Johannesburg Stock Exchange’s Sustainability Disclosure Guidance and Climate Disclosure Guidance³⁶ constitute useful examples of how the ISSB management and materiality approach can be incorporated while also identifying priority ESG risks and opportunities that are relevant to the national context.

IFC’s *Beyond the Balance Sheet* toolkit (IFC 2018) provides further guidance on how to link sustainability disclosures to ESG risk management approaches (that is, the complete set of components that provide the foundation and organizational arrangements for designing, implementing, monitoring, reviewing, and continually improving risk management) to be consistent with the IFC’s Performance Standards, which define IFC clients’ responsibilities for managing their environmental and social risks (as discussed in a previous section). According to the tool kit, disclosures should describe the risk management process—how risks are identified, monitored, and controlled; how the level of risk is evaluated; and what information is used. Disclosures should describe the methodology for determining the response to risk events. They should also address how the company evaluates the effectiveness of its risk controls to determine whether the risk level is within the organization’s risk appetite, and how it decides whether additional controls are required.

³⁶ For more information about the Sustainability Disclosure Guidance and the Climate Disclosure Guidance, see the Johannesburg Stock Exchange website at <https://www.jse.co.za/our-business/sustainability/jses-sustainability-and-climate-disclosure-guidance>.

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PRINCIPLE

3

Be dynamic in adjustments reflecting changes in policies, technologies, and state of the transition.

A. Operational Challenges

B. Takeaways from Technical and Comparative Analysis

C. Methodological Suggestions to Apply the Principle

Approaches to aligning sustainable investments will be most effective if they reflect market changes and the development of green and sustainable technologies³⁷ as well as the change of both domestic and international policy agendas and priorities. Dynamism will also be needed in response to improvements over time in the availability and quality of data and metrics, and to encompass the changing nature of the transition and achievement of targets. Such dynamic adjustments could take the form of changing coverage and technical standards. Approaches that initially focus on climate should consider the need to expand their coverage to include other sustainability goals, such as (a) biodiversity and ecosystems and (b) social aspects of sustainability. Authorities developing approaches that currently focus on “pure green” activities could also consider expanding the coverage to include transition activities.

³⁷ Refer to Cervantes, Žarnic, and Copeland 2018.

A. OPERATIONAL CHALLENGES

Design of the Sustainable Finance Alignment Approach

■ **Adapting alignment approaches to exogenous evolutions so that they can adopt an evolving and iterative nature.** The following elements should be considered:

- ◆ **Broadening of the perimeter** for reasons such as evolving patterns in energy sources, evolving production cost trends and financing priorities, or the reorganization of industrial structures related to the low-carbon transition.
- ◆ **Improvement in standards applied in the alignment approach**—for instance, greenhouse gas measurement methodologies; global, regional, or national standards for the assessment of Principle 2 (do no significant harm); or the evolution of certification and verification processes (which may have consequences on the granularity of the alignment approach).
- ◆ **Scientific developments and technological changes**, especially as asset- and entity-level alignment approaches contribute to the mobilization of capital for research, development, and innovation (R&D&I) of alternative low-carbon technologies and solutions (see Principle 5).
- ◆ **Evolution in demand patterns**,³⁸ especially given that the design of asset-level alignment approaches may often be formulated in a region's or country's social and economic context. For instance, the rising demand of electricity due to rapid urbanization in emerging markets or to electrification across the transportation, building, and industrial sectors may entail a continued dependence on fossil fuels in the short to medium term. Demand is nonetheless prone to evolve over time toward low-carbon fuels. In addition, taking into consideration the evolution in demand patterns may shift not only the criteria embedded in the alignment approaches but also the prioritization in sectoral/industrial coverage.
- ◆ **Policy and regulatory evolutions.** The adaptation of alignment approaches to changing global, regional, and national policies is a fundamental topic, leading to a series of methodological issues to be considered. One must consider whether these approaches can (a) be directly linked to a national (or regional or global) road map for decarbonization (and, more broadly, for sustainability), (b) be directly linked to a national or regional fiscal framework (for example, a carbon tax regime), (c) encompass a holistic sectoral approach while ensuring that the notion of transition is reflected in criteria setting, and (d) evolve over time to account for technological and scientific innovation in decarbonizing energy and industrial processes.

■ **Taking into consideration and recognizing activities for which Paris-aligned decarbonization is technically unfeasible, based on the nature of the technology used** (for example, coal- and lignite-related activities; fossil fuel extraction; thermal power plants; and internal combustion engine vehicles), that do or may potentially cause significant harm despite the reliance on potential abatement technologies.³⁹

38 For broader research on behavioral and societal transformations and their inclusion in energy policy modeling, see Nikas et al. (2020, 2): "Relatively, demand is largely underrepresented, via technological options in energy efficiency improvements. Values, choices, cohesion, culture, and lifestyle shifts in society are indirectly narrated as assumptions, not interacting with the vividly modelled flows between technology, economy, environment, and policy. Even modelling scenarios looking at end-use transformations, like digitalisation of daily life and pervasive integration of new information technologies into energy services, mostly explore the maximum potential of technological breakthroughs taking into account a number of behavioural changes but not fully exploring how they could come about or how realistic they are. They overlook that, without the necessary behavioural and societal transformations, the world is very possibly looking at a generalised, society-wide rebound effect resembling known paradoxes. This diverse range of possible, potentially large rebound effects is not sufficiently explored."

39 See Bi, Bauer, and Jewell (2023); Jakob et al. (2020); and Rekker et al. (2022).

Disclosures and Data (in relation to Principle 4)

- **Accounting for legacy effects**, when an asset is in conformity with an earlier classification but underlying compliance criteria have changed, and accounting for potential grandfathering requirements in using alignment approaches for financial instruments.
- **Ensuring consistency in disclosures across timelines, industries, and markets.** To compare a series of assets and instruments, it appears to be key to consider timing-related issues in reporting and availability of quality data to ensure the applicability of alignment approaches. Tracking and restating alignment with evolving taxonomies includes a series of practical consequences that ultimately may influence labeling and market performance.

B. TAKEAWAYS FROM TECHNICAL AND COMPARATIVE ANALYSIS

The comparative analysis shows the following:

- **Alignment approaches that are reflective of market changes, technological development, and changes in both domestic and international policy agendas and priorities are relatively scarce and fairly disparate.**
 - ◆ **The ASEAN Taxonomy** integrates a periodic review with a principles-based approach “to keep pace with global sustainability goals and technological advancements, thereby remaining relevant and effective” without providing further details at this stage (ASEAN 2023, 15).
 - ◆ **The Mongolian Green Taxonomy** is to be reviewed every three to five years to account for “policy shifts, scientific developments, technological changes, and new industry needs in the green finance space” (Financial Stability Commission of Mongolia 2020, 3).
 - ◆ **The Singapore Taxonomy**⁴⁰ is founded on the use of the Sectoral Decarbonization Approach methodology, with emission-intensity thresholds subject to change over time, given the inherent characteristics of each industrial sector (such as mitigation potential and growth rate relative to economic and population growth) and in order to allocate an appropriate carbon budget.
 - ◆ Although **the EU taxonomy**⁴¹ includes a three-year review period for transition and enabling components (that is, underlying technical screening criteria outlined in delegated acts), it remains unclear to what extent, in practice, the compliance thresholds (for example, greenhouse gas emissions volumes and carbon intensity thresholds) are planned to be adjusted over time to incorporate the latest developments in climate science and technological innovations.
 - ◆ **The South African taxonomy** anticipates a regular review in addition to a grandfathering clause (South Africa National Treasury 2022).
- **Selected asset-level alignment approaches have evolved their criteria for those activities that are highly carbon intensive.** For example, the Chinese 2021 edition of the *Green Bond Endorsed Project Catalogue* has removed “clean coal,” which had been in the previous version. (“Clean coal” included carbon capture technologies during combustion and the removal of impurities by coal-washing plants.)

40 Monetary Authority of Singapore, last updated July 26, 2022, <https://www.mas.gov.sg/development/sustainable-finance/taxonomy>.

41 European Commission, “EU Taxonomy for Sustainable Activities,” https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en.

■ **When alignment approaches apply to financial instruments**, the degree of alignment once attributed to a green bond (or other type of sustainability bond) may evolve, depending on the duration of the grandfathering period. This evolution would affect instruments' market performance (tenor and maturity profile) and potentially lead to the loss of an associated label.

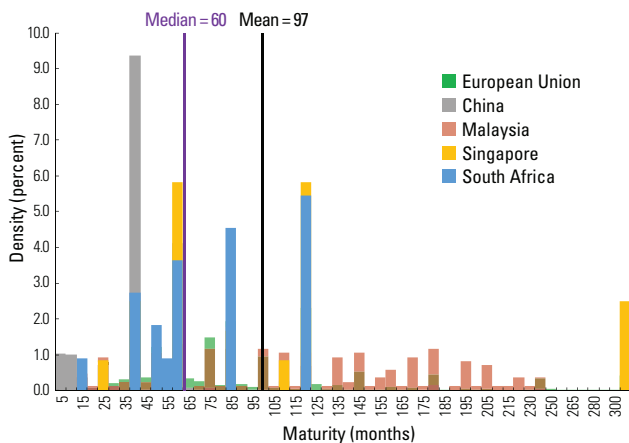
Yet if the grandfathering period is too short, market research performed in the context of this project (see figure 19) shows it may lead to a series of challenges, including (a) a potentially high level of discrepancy with average bond maturities, with negative effects including loss of alignment or taxonomy “credentials” (or both) and (b) secondary effects on investors and other market participants, further discouraging the use of such alignment approaches.

Figure 19: The maturity and tenor profiles of sustainable bonds are key characteristics to include in the context of a dynamic design and use of asset-level alignment approaches

As of the end of 2022, the tenor profile of (use-of-proceeds) green bond issuance in jurisdictions that have adopted taxonomies shows an average maturity at about eight years.

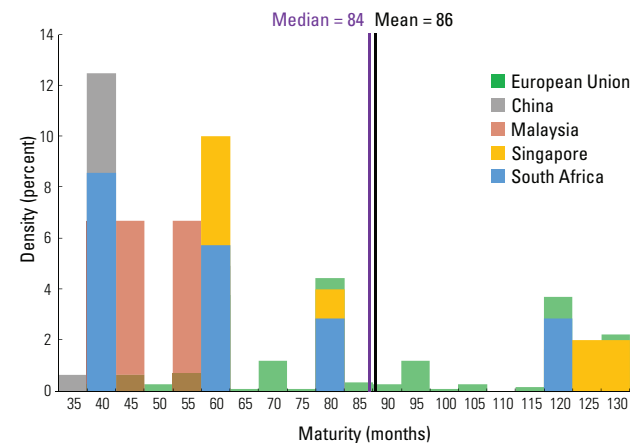
Meanwhile, the profile of sustainability-linked bond issuance in the same jurisdictions is shorter, at about seven years.

a. Green bond maturity (since 2016)



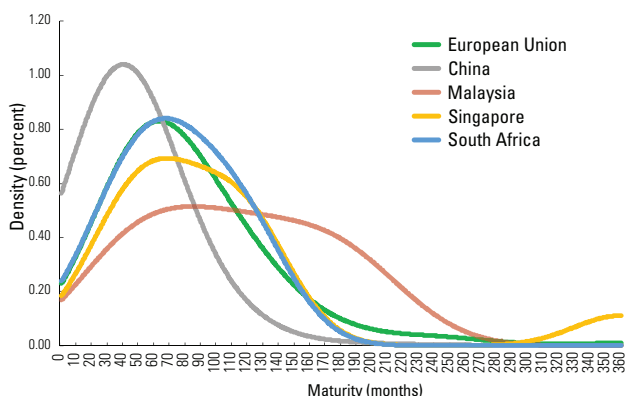
The distribution of green bond maturity is strongly skewed to the right, illustrating a bond market characterized by a large volume of issuance with maturities under five years, especially in China, the EU, and South Africa.

b. Sustainability-linked bond maturity (since 2018)

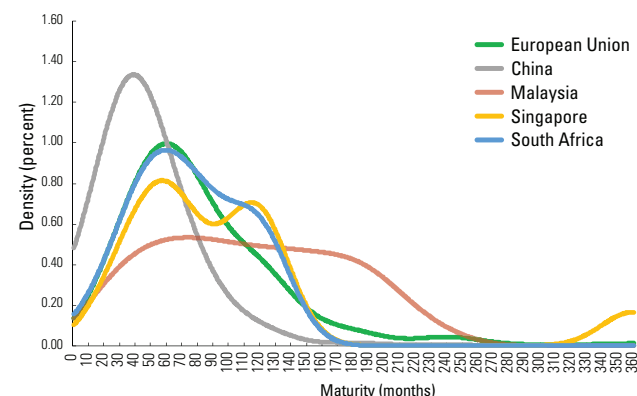


This right-skewed distribution is exacerbated in the sustainability-linked bond market, with short-duration maturities in emerging markets and developing economies and longer maturities in the EU and Singapore.

c. Smoothed distribution function of green bond maturity (since 2016)



d. Smoothed distribution function of sustainability-linked bond maturity (since 2018)



Sources: Bloomberg Finance L.P.; IMF staff calculations.

Note: Data for panels a through d are for all of 2022 and are based on country of risk. For panels c and d, corporate and government bonds are included, while perpetual notes are excluded. Jurisdictions included in the analysis are those that have recently implemented a taxonomy as a prime tool for sustainable finance alignment (European Union since 2020, China since 2015, Malaysia since 2021, Singapore since 2021, and South Africa since 2022). EU = European Union.

C. METHODOLOGICAL SUGGESTIONS TO APPLY THE PRINCIPLE

Design of the Sustainable Finance Alignment Approach

- **Alignment approaches should be reviewed and updated periodically to capture changing expectations as countries and industries move forward in decarbonization over time and while transition pathways across EMDEs progressively converge. Doing so is particularly important for high-priority sectors for decarbonization that would be more prone to such evolutions.**

All types of alignment approaches indeed need to evolve over time (notably as technologies develop), as more and more countries and entities are progressively shifting their business models to align on a low-carbon pathway and as methodologies and scenarios mature and therefore allow for more detailed and specific assessments. The approaches should therefore be classifications evolving in hand with scientific, economic, and technical knowledge and capabilities. This is the case at the asset level (taxonomies and other classifications) but also with regard to reference scenarios for entity- and portfolio-level methodologies, for instance.

In this context, new indicators may be relevant to complement preexisting indicators—for example, the use of enabling technologies, or effects on ecosystems as key to the achievement of carbon neutrality purposes. Moreover, sectors and activities not necessarily included ab initio in the taxonomy (such as mining activities, food and beverage, and textile production) may be included at a later stage owing to the abovementioned factors. It is key that the asset-level alignment approach make clear that it may be bound to evolve, as financial market participants may misinterpret the climate performance and relevance of such activities.

It is all the more important that the implementation of asset-level alignment approaches aim to mobilize capital for R&D&I of alternative low-carbon technologies and solutions. Yet, given the mismatch between the risk profile of available and required capital, equity eligibility (and reliability) is crucial when aiming to mobilize equity capital, therefore providing adequate levels of loss absorbency to support debt issuance. It is therefore key to bridge the financing gap and provide long-term capital—especially for renewable energy infrastructure and low-carbon technologies (such as carbon capture and storage, batteries, and low-carbon hydrogen) that largely require equity finance.

- **In this context, the framework should detail further the conditions under which approaches would evolve,** and according to which developments—especially regarding the governance framework in which such changes may effectively operate.

Although, for the moment, a few asset-level alignment approaches do include continuous review and development models, there is little clarity as to the exact developments that may have such an effect on taxonomies, the conditions or trigger elements that would lead to such evolutions, and the governance of such review processes (for instance, the role of an external committee; potential ex ante assessment of the taxonomy's implementation and influence on financing and investment patterns, development of sustainable finance markets, and decarbonization strategies; and the relationship to potential decarbonization road maps at the national, regional, or global level).

Moreover, review entails various challenges, including the following:

- ◆ **Changes in governments and political priorities** may affect the taxonomy governance.
- ◆ **Ample resources and time are needed**, in addition to continuous capacity building of regulators, financial market participants, and other stakeholders as taxonomies are evolving.
- ◆ **The development of regulations for different users and instruments is usually a lengthy process and entails costs** in addition to those entailed by continuous monitoring and tracking of taxonomy-aligned assets and investments.

Such clarity is, however, crucial in designing asset-level alignment approaches and should be a primary element in their design. **Alignment approaches need to have permanent governance committees to address the challenges of implementation and to update the sectors, activities, and criteria; this will require resources and time for the public entities. More specifically, the entities need the following:**

- ◆ Clear responsibilities and mandate of the governance committees
 - ◆ A process to conduct stakeholder discussion processes every *n* years
 - ◆ A process to ensure continuous capacity building of stakeholders
 - ◆ The design and implementation of measurement, reporting, and verification systems and mechanisms
- **The framework should ensure that transition plans, as part of Principle 6, closely integrate these evolutions—**notably, regarding the need to consider the transition of carbon-intensive assets, activities, and sectors in line with scientific and technological developments.

Transitional activities and pathways should indeed be timebound, as they represent an improvement over the status quo. Given that transition requirements should progressively become more stringent to adapt to scientific and technological developments, it is crucial that disclosures on transition plans integrate such evolutions and make direct references to the time span in which they operate.

The framework should, however, consider an adaptation of full grandfathering (see next section) in the case of transitional activities, to minimize lock-in risks, depending on the timeline and stringency of the decarbonization approach.

Disclosures and Data

- **It is key to develop an inclusive approach to the treatment of green and sustainability-aligned bond instruments already in the market—**without undermining the ambition of alignment approaches—by integrating the concept of equivalent information into the framework.⁴²

A consistent application of disclosures against green debt throughout the alignment approaches' frameworks is a primary objective. This inclusive approach aims to mainstream the market uptake of such alignment approaches and avoid instability, while insisting on preserving the environmental materiality of the approaches and their value for financing transitional activities and assets.

42 See the analysis of the Platform on Sustainable Finance (2022).

Concretely, the financial market participant's use of obtained equivalent information should be made available directly from investee companies or from third-party providers when information about the degree to which investments are made in aligned activities is not readily available from public disclosures by investee companies (for example, forward-looking data and qualitative information). Therefore, the use of such information in debt issuance would be further encouraged.

- **The framework should integrate the concept of full grandfathering** (that is, a provision by which an old rule continues to apply to specific existing situations while a new rule will apply to all future cases) to committed (and/or allocated) proceeds of green and other types of sustainability financial instruments (such as financing fixed assets, capex, operational expenses [opex], sovereign expenditures, equity, and debt).

Under this approach, if the criteria of asset-level approaches change after the issuance of a green (or other type of sustainability) bond, the issuer would be prohibited from applying the amended criteria within a *determined* period of time after the publication of the alignment approach's criteria (for example, 5, 10, or 15 years). Instead, the alignment status of a such a green or sustainability bond would be preserved for its entire maturity.

Incorporating such a possibility into the framework of the use of asset-level alignment approaches in the debt market would contribute to (a) the stability and growth of the sustainability debt market, (b) the attractiveness of such instruments for issuers (especially when the change in criteria may be beyond the issuers' control), (c) the possibility of issuing debt in high-priority sectors for decarbonization (beyond those where low-carbon activities are already at scale), (d) the closer integration of debt instruments' issuance into companies' transition planning (without conflicting timelines), and (e) greater usability (such as to track alignment) and reliability of alignment approaches per se.

Verification by a third party should be a prerequisite for the implementation of this grandfathering provision, as should compliance with potentially preexisting legislative requirements.

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PRINCIPLE

4

Reflect good governance and transparency.

Overview

- A. Operational Challenges**
- B. Takeaways from Technical and Comparative Analysis**
- C. Methodological Suggestions to Apply the Principle**

The implementation of alignment approaches should embed clear processes governing (a) how they are to be used, whom they target, and how they engage those stakeholders; (b) what claims can be made and for what purpose; (c) what needs to be disclosed; (d) what aspects should be externally verified; (e) how key performance indicators should be chosen; and (f) how impact will be measured and monitored. Governance of alignment approaches should ensure market credibility by supporting the flow of information about the compliance of entities, activities, and assets with alignment approaches as well as environmental and social outcomes. Therefore, assurance and verification will play an increasingly important role but should be managed through suitable standards to ensure credibility and to ensure accessibility for SMEs and entities in EMDEs.⁴³ To remain credible, alignment approaches should then also be subject to regular review on a transparent basis and should ensure inclusivity of users, beneficiaries, and affected stakeholders.

⁴³ This section is drawn in part from the BIS paper, “Information Governance in Sustainable Finance” (Aramonte and Packer 2022).

OVERVIEW

Good governance and transparency are critical during both the development and maintenance stages of alignment approaches. Essential elements include the following:

- Clear ownership and leadership by appropriate institutions in the market.
- Clarity of the purpose of the alignment approach, how it will be implemented, and what claims can be made.
- Clear guidance on disclosure of alignment, performance, and outcomes.
- Representation of relevant voices during stakeholder consultation and in ongoing oversight structures.
- Transparent communication to interested and affected parties on governance and implementation matters.
- A process to respond to stakeholder grievances to ensure accountability and responsiveness to market realities.
- A commitment to review and respond to emerging information on the effectiveness of the alignment approach.
- A commitment to promote ease of use and broad applicability through interoperability and the use of common international approaches while also reflecting national priorities and conditions.

A. OPERATIONAL CHALLENGES

Design of the Sustainable Finance Alignment Approach

- **Ownership and leadership by appropriate institutions in the market.** Governance and oversight of alignment approaches can be conducted through the appropriate regulators, independent bodies, or multistakeholder platforms. Governance is a foundation for ensuring the management of risk, integrity in processes, oversight of effective management systems, and alignment with ethical and good practices. Governance structures during the preparation of an alignment approach should promote principles and frameworks for credibility and transparency. They should also ensure the participation of technical experts who can guide the design process by drawing on their deep industry knowledge.
- **During the maintenance phase, governance structures ensure long-term oversight, accountability mechanisms, and timely expansion and updating of the alignment approach.** This is in line with technical considerations laid out in Principle 3 regarding the evolution and review of alignment approaches. For example, sectors, activities, and criteria within taxonomies will need to be expanded and updated over time as sustainable and inclusive markets evolve and industry standards improve. Similarly, labels, ratings, and portfolio alignment approaches should be updated to reflect new products and industry practices and evolving net-zero pathways (Portfolio Alignment Team 2020).
- **Clarity of the purpose of the alignment approach, how it will be implemented, and what claims can be made (figure 20)** Comparative research has found divergence in the roles of governments and the types of agencies involved in the development of alignment approaches, ranging from direct government involvement to public-private partnerships with standard setters, stock exchanges, or industry associations. When government participates directly, the types of ministries or agencies involved vary greatly, ranging from central banks and securities regulators to environmental and social ministries. Such diversity results in differing use and enforcement of approaches. The following are examples in the context of asset-level alignment approaches (specifically, taxonomies):

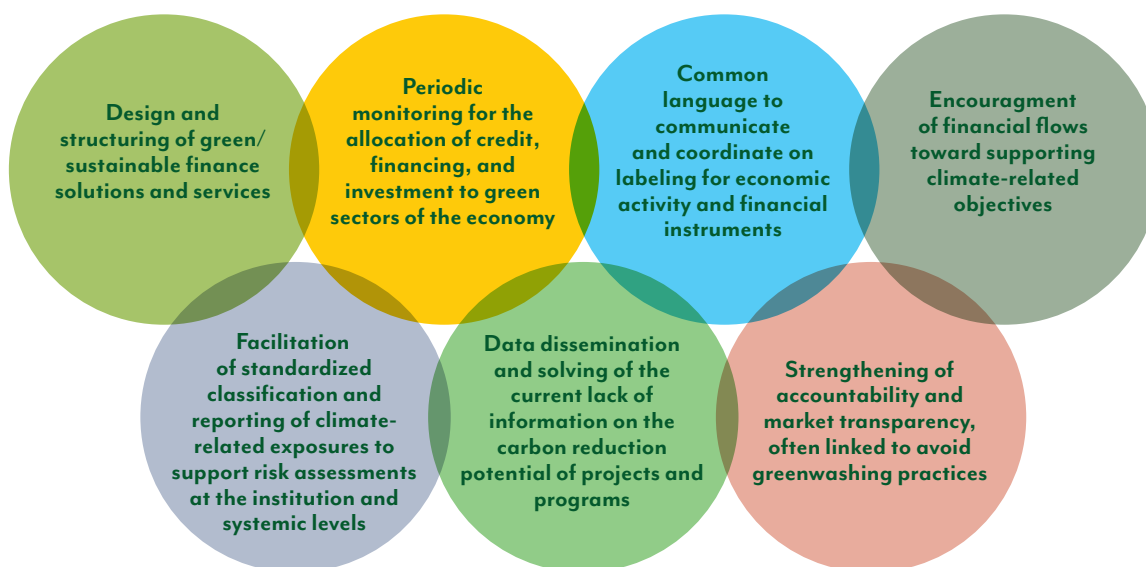
- ◆ In Bangladesh, the Central Bank (Bangladesh Bank) is involved, and therefore the taxonomy focuses on financial institutions and is enforced strictly as part of bank disclosure and supervision. The instrument also encompasses both a green and a sustainable finance taxonomy.
- ◆ In Brazil, the green taxonomy was developed by the banking association (Federação Brasileira de Bancos; FEBRABAN) and does not claim to be the official taxonomy for the country. This limitation affects the types of uses for the taxonomy and the types of entities targeted.
- ◆ In Colombia, the Financial Superintendence of Colombia (SFC) is in charge of the taxonomy and has oversight of financial regulation and market systems. Therefore, it was able to add insurance companies to the use cases and has brought in complementary ESG disclosure regulations.

The entity in charge influences whether the alignment approach is used chiefly for direct financial sector supervision (for example, a banking regulator), to ensure product integrity (for example, a market conduct regulator), or to generate information for the proper functioning of the sustainable finance market (for example, a capital markets regulator). For instance, the alignment approach could be limited to a specific product or part of the financial sector—such as a taxonomy within a green bond regulation—or it could be designed for cross-cutting use across the financial sector (such as in the EU).

Disclosures and Data (in relation to Principle 4)

Therefore, applying different objectives to alignment approaches may have different effects on disclosures and subsequent verification. Examples of use cases include (a) setting a course of action for the financial system, (b) providing relevant information for the transition of the real economy, (c) preventing greenwashing, (d) labeling of investments funds and financial instruments, and (e) increasing transparency of listed and unlisted companies.

Figure 20: Different objectives of alignment approaches



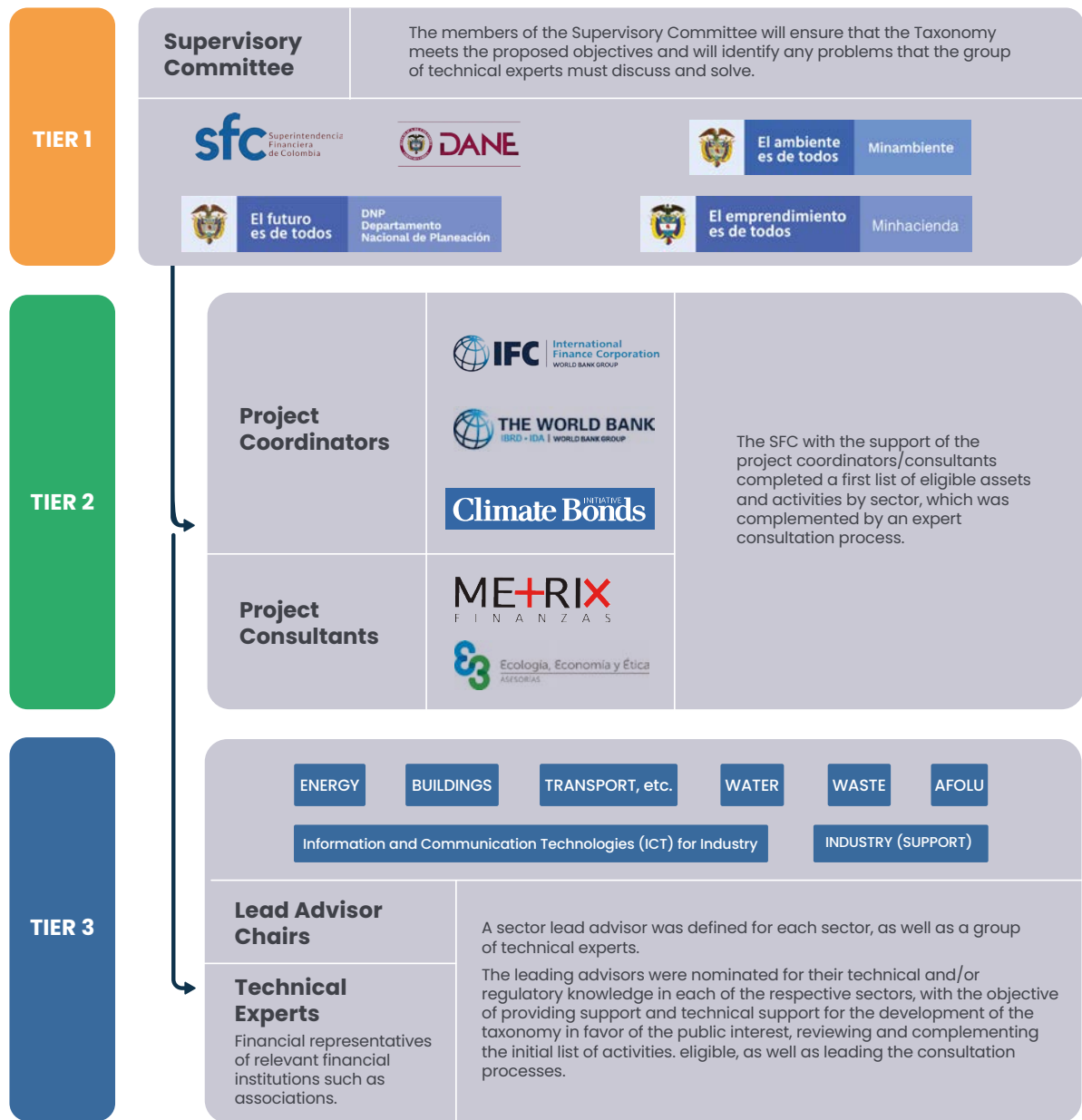
Source: Original figure for this publication.

- **Clear guidance on disclosure of performance and outcomes.** Design and use of alignment approaches are closely associated with improving the availability of data to the market to direct capital to assets and activities that achieve alignment outcomes. The approach should clearly state the procedures for measuring and reporting on performance and outcomes of alignment, including the metrics to be used and the principles for ensuring the materiality, credibility, and comparability of disclosures.
- **Representation of relevant voices during stakeholder consultation and in ongoing oversight structures.** Ongoing stakeholder engagement and dialogue are critical to ensure accountability and effective design of alignment. Inclusion of relevant stakeholders is also important to ensure the inclusivity and accessibility of the alignment approach. Technical elements in the alignment approach, including disclosure requirements and verification expectations, should be assessed in terms of the burden placed on SMEs, households, and vulnerable groups. They should also ideally add value, such as by helping businesses secure contracts from buyers and enabling access to finance.
- **Transparent communication to interested and affected parties on governance and implementation matters.** Regular disclosure on the performance and governance of the alignment approach builds credibility in the approach and supports the market's efforts to adjust to new developments and future plans.
- **A process to respond to stakeholder grievances to ensure accountability and responsiveness to market realities.** An external grievance mechanism ensures that interested and affected stakeholders, including benchmarked entities, can raise concerns or queries related to the alignment approach. Such a mechanism should be easily accessible, such as through a website or hotline, and there should be a clearly communicated process for how grievances will be received, processed, and responded to. Grievances and outcomes of resolution processes should be tracked as part of the ongoing management of the alignment approach and should inform future updates.
- **A commitment to review and respond to emerging information on the effectiveness of the alignment approach.** Regular audits and reviews of the alignment approach should be conducted to account for changing regulations and technologies, progress against targets, the inclusion of additional sectors, and the inclusion of transition or enabling activities.
- **A commitment to promote ease of use and broad applicability through interoperability and the use of common international approaches, while also reflecting national priorities and conditions.** Most countries are interested in achieving a balance between national and/or regional priorities and building toward commonality and interoperability across jurisdictions. This can be achieved by (a) integrating common international principles into national approaches and/or (b) officially recognizing approaches in other jurisdictions (“equivalence”).

B. KEY TAKEAWAYS FROM TECHNICAL AND COMPARATIVE ANALYSIS

An example of the governance structure from the Colombia taxonomy project outlines three tiers to ensure effective governance of the taxonomy project (figure 21).⁴⁴

Figure 21: Example of governance structure: Colombia taxonomy project



Source: Climate Bonds Initiative 2021, 90.

Note: AFOLU = agriculture, forestry, and other land use; SFC = Financial Superintendence of Colombia.

44 Extracted from Climate Bonds Initiative (2021).

In parallel, public authorities may target reductions in cost of capital for less carbon-intensive firms and investments in several ways, including (a) preferential treatment of the loans or securities used to finance these firms or investments, (b) revolving around multilateral institutions that include climate risks and objectives in financial flows, and (c) de-risking sustainable-finance instruments purchased by the private sector with partial loss absorption by public bodies. In some of these cases, alignment approaches have been prime tools. More importantly, all three sets of policy tools hinge on accurate information about the sustainability profiles of companies or investments, and governance is an important ingredient to achieving such accuracy.

Strong governance standards can help overcome a range of disclosure and information challenges in the design and successful implementation of alignment approaches.

In a number of jurisdictions, alignment approaches play a significant role in the broader sustainable finance disclosure architecture, such as taxonomies developed in China, the European Union, and progressively in the ASEAN economies. However, only a few alignment approaches explicitly emphasize disclosures, particularly when their focus is on bond and loan issuance on a regulatory or semi-regulatory basis (Canada, Indonesia, Japan, Malaysia). For example, the Indonesian taxonomy is a guideline for financial market participants to label and record their financing activity as well as their green portfolios. In addition, taxonomies developed by private financial institutions or associations elsewhere call for disclosure requirements that vary by instrument, although most aim to provide aggregate data across instruments—including prevented GHG emissions, committed loan amounts, and sectoral breakdowns in loan allocation (for example, Climate Bonds Initiative [CBI], Santander, Natixis).

The following are common disclosure dilemmas in relation to alignment approaches:

■ **Quality of information available to investors (Pucker 2021).** Sustainable finance may be marred by market failures that are similar to, and may operate in a more complex and less developed data environment than, conventional finance. These market failures are conflicts of interest that cannot be solved by private contracting and need to be addressed with governance provisions (which generally constrain the behavior of various parties to minimize the risk of conflicts of interest). The likelihood of deliberate misreporting, therefore, increases with four main factors: (a) lower litigation risk, (b) higher incidence of insider transactions, (c) financial distress, and (d) within-industry concentration since incumbents downplay profitability to deter entrance (Rogers et al. 2005). Some patterns in sustainable finance may heighten or reduce the severity of market failures and should therefore be closely considered when designing governance frameworks in this context (Claessens, Tarashev, and Borio 2022). For instance, while companies with high sustainability scores generally have more informative earnings reports and fewer episodes of high-profile misconduct, this focus on sustainability appears to propagate through supply chains (Dai, Liang, and Ng 2021; Surroca, Tribó, and Zahra 2013). Conversely, the difficulty of quantifying a company's sustainability standing may be exacerbated by the presence of global supply chains and multinational groups and may result in controversial activities being transferred to countries with weaker monitoring frameworks. Yet the ability of investors to spot bias is a function of uncertainty about future prospects, volatility in realized results, and financial distress.

In this context, market failures from insufficient disclosure practices in traditional capital markets can lead to reduced funding flows and higher funding costs. By improving information quality, governance frameworks can help steer investors toward objectives that are consistent with the preferences and policy objectives of sustainability.⁴⁵ Information produced by financial market participants can also help set the appropriate price for externalities (for example, carbon taxes), thus enhancing the sustainability of economic activities.

45 Goss and Roberts (2011, 1795), who analyze the cost of bank loans for sustainable firms, write that “banks are able to discriminate between sincere attempts to align the goals of the firm with the broader societal good and value-destroying agency costs.” By contrast, the recent literature on the pricing of climate risks concludes that the information available to investors about these risks and their consequences is often incomplete or imperfect (see Eren, Merten, and Verhoeven 2022). Also refer to Christensen, Hail, and Leuz (2021).

- **Minimum disclosure requirements that don't distinguish between entity-level reporting and activity/sector-level reporting.** An asset-level approach that ignores entity-based information altogether is more prone to greenwashing risks (such as misleading labeling), since a company or an issuer that can label part of its activities, revenues, and/or projects as aligned with sustainability criteria may not necessarily be aligned as an entity. While much of the sustainable finance market—particularly green bonds—has focused on verifying green, low-carbon, or sustainable activities, asset-level alignment approaches are progressively incorporating entity-based information. Therefore, taxonomies—and other asset-based alignment approaches—must not examine activities in isolation but rather must recognize progress relative to a legacy of previous activities that fall under a given actor or entity's remit. Given that such alignment approaches should be applicable to a suite of financial products (bond and loan instruments beyond use-of-proceeds models, equity financing, bank lending, project finance), disclosures at the entity level would help financial market participants map revenues or assets to different industrial activities and therefore assess the company's alignment to national, regional, or global industry-specific climate-related targets. See, for example, the proposal in the draft Australian taxonomy to evaluate a funding recipient against entity-level criteria such as science-based targets or net-zero commitments, when financing at the entity level for general use of proceeds (Australian Sustainable Finance Institute 2022). As emphasized by the Bank for International Settlements (Ehlers, Gao, and Packer 2021, 17), most key performance indicators are “best measured at the entity (that is, the issuer) level rather than the project level.” BIS has argued that analogous to GHG emission exporting, companies could shift emission-intensive parts of a project to other projects, creating the *appearance* of emission reduction for any project that may be considered taxonomy aligned or certifiable by a label in the disclosing jurisdiction. This is an important point, as diversified companies often operate across multiple jurisdictions, sectors, and subsectors.

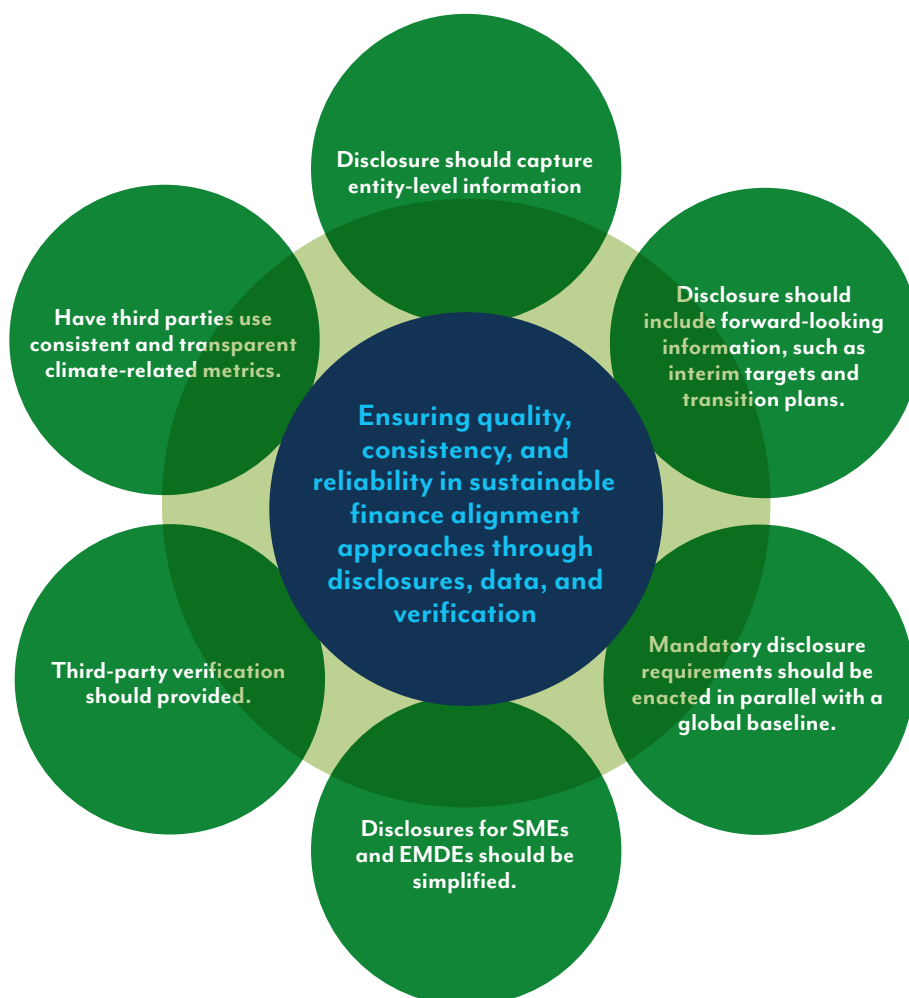
In addition, as underlined by the Network for Greening the Financial System (NGFS 2022) and the OECD (2022), policy makers, financial authorities, and central banks (where appropriate within domestic mandates) should strengthen the availability and use of reliable, comparable, and high-quality data to assess climate risks and opportunities in line with global baseline standards. In view of this objective, financial authorities should therefore consider working toward mandatory disclosure requirements in line with, or building on, the global baseline. Authorities should also explore additional and voluntary tools available to them that could provide investors with data beyond a globally defined baseline.

- **Addressing the needs of diverse users of information.** Sustainable finance is of interest to a broader set of stakeholders than just investors in a company's equity or debt securities. Given the need to account for the externalities that a firm imposes on the environment in which it operates, a common view is that disseminated information should be material to both investors and other stakeholders (“double materiality”), and the adoption of double materiality standards could improve the quality and comparability of the information provided.⁴⁶

While companies are increasingly seeking to strengthen their environmental credentials, and investors—and other financial market participants—are increasingly directing greater funds toward investments with positive environmental associations, it is critical that alignment approaches fully integrate such a principle (see figure 22). Accordingly, it is important for policy makers and standard setters to ensure that capital allocation achieves the implied (or claimed) climate or environmental impact (or both). Although it may require the development of fit-for-purpose tools to assess the environmental consequences of financial and investment decisions, the reliance on climate and environmental disclosure metrics that ultimately make up alignment approaches—and that are environmentally material—is a crucial objective. Alignment approaches may indeed prove key to identifying core elements and metrics for environmental impact. As such, they may contribute to the improvement of the effectiveness of disclosure and data availability, as well as drive harmonization of scoring methodologies. They may ultimately enhance comparability of disclosed information, while accelerating real positive climate and/or environmental impact.

46 See Täger (2021) and Pucker and King (2022).

Figure 22: Critical considerations for disclosure regarding alignment approaches



Principle 4 serves as a core principle given the close connection between alignment approaches and disclosure of climate and/or environmental activities and assets that combine to provide consistent, comparable, and trustworthy data to financial market participants and supervisors.

Source: Original figure for this publication.

Note: EMDEs = emerging markets and developing economies; SMEs = small and medium enterprises.

- **Managing data complexity.** Sustainability-related data needs are inherently higher than those in conventional finance. For example, investors in thematic bonds, contrasted with “vanilla” bonds, will demand additional data on the use of proceeds or on key performance indicators as well as ongoing data updates to track progress toward promised effects. Alignment approaches can help identify core elements of, and metrics for, environmental impact and thus contribute to the improvement of the effectiveness of disclosure and data availability as well as harmonization of scoring methodologies.

- **Ensuring consistent and transparent use of climate-related metrics.** Metrics used by third parties (such as index providers and transition finance framework providers, including authorities and industry bodies) should support the global comparison of climate-related risks and opportunities as well as the achievement of climate and environmental objectives for those financial market participants committed to meet those objectives. Methodological elements should be transparent to support the quality of climate-related metrics.

SMEs in all economies and firms in EMDEs⁴⁷ typically have fewer resources to comply with onerous disclosure requirements. Different disclosure regimes for such firms could also solve the issues of (a) limited availability of assurance services and (b) excessive compliance costs relative to their size and the lower risks that they present. They could also address broader concerns about these firms' ability to acquire and process complex data. Less data should be expected from companies further down the supply chain because of the associated costs. Therefore, one strategy is to prioritize key metrics, such as the following: (a) the main sectors and activities in which the SMEs operate; (b) Scope 1 and Scope 2 GHG emissions, which can be integrated into Scope 3 for larger entities; and (c) the potential magnitude of excluded GHG emissions. SMEs may contemplate a simplified transition plan, with a focus on (a) key implemented and planned actions for decarbonization, associated with governance practices (for example, management's role) and (b) climate-related initiatives undertaken and planned (such as, energy efficiency in buildings and in production processes; low-carbon energy generation and energy consumption; waste reduction and materials circularity; fugitive GHG emissions reductions; GHG emissions in nonenergy industrial processes; transportation; and in-company behavioral change). Disclosure regimes for SMEs can focus on being designed in a way that strengthens their ability to secure contracts with buyers along supply chains and to gain access to finance from banks because of their climate credentials.

- **Increasing credibility through external review.** Verification, auditing, and assurance of climate-related disclosures are required or recommended in a number of large jurisdictions, though not all: the European Union, and in countries such as China, Japan, and the United Kingdom. For transition plans, the G-20 Sustainable Finance Working Group (SFWG) recommends the use of independent third-party verification/assurance, such as auditors, consultancies, nongovernmental organizations (NGOs), or assurance companies—keeping in mind domestic circumstances—and encourages third-party verification bodies to be transparent about the methodologies they use to verify information in transition plans. Use of assurance and verification has implications for the costs of adopting alignment approaches and can therefore be perceived as a market barrier. It also requires that regulators consider the availability of local service providers and provide guidance on suitable standards of practice, such as whether assurance providers must be certified according to local or international standards. Other options that may add more value for SMEs include getting certified in line with specific labels or programs, such as the International Social and Environmental Accreditation and Labeling Alliance (ISEAL) or International Organization for Standardization (ISO)-type standards. Assurance will generally focus on the systems that underpin ESG performance. If verification of GHG Scope 1, 2, and 3 is the main goal, then audit/assurance/verification can be limited to that topic.

As emphasized by the NGFS (2022, 30), a central benefit of having properly designed assessments or external review processes is that “they would allow investors or companies to transmit credible signals to the market on their decarbonization effort, e.g., their alignment with the Paris Agreement or their carbon footprint. Independent and professional external reviews are of critical importance to prevent misleading information about the environmental benefits of an asset and are thus key to mitigate greenwashing.” See box 4.

47 For broader research on the challenges related to climate action for SMEs in EMDEs, refer to Grantham Research Institute (2021); OECD (n.d.).

Policy makers should aim to provide the right incentives for high-quality and effective external review, backed up by uniform standards of conduct for the providers of certification and verification services. In addition, an ex-post assessment of performance by external review institutions should also be conducted. BIS (Aramonte and Packer 2022) proposes action to reduce incentives for raters to provide lenient assessments by restricting competition among rating agencies and thus avoid “ratings shopping”⁴⁸ and to give more weight to ratings from agencies with significant volume outside sustainable finance. However, this approach should be balanced against the need to ensure the availability of credible ratings providers and external reviewers across jurisdictions. One of the challenges that EMDEs face is the lack of qualified service providers that can provide ratings and assurance services in line with national context and alignment approaches, including comprehensive ratings coverage of local listed companies. International assurance providers may also be reluctant to offer external review for alignment approaches with which they are less familiar, and which diverge from common international practices.

Box 4: The Use of Financial Technology to Ensure Avoidance of Greenwashing: Relevant Insights

The term “greenwashing” was originally coined by prominent environmentalist Jay Westerveld in a 1986 essay in which he claimed the hotel industry falsely promoted the reuse of towels as part of a broader environmental strategy when, in fact, the act was designed as a cost-saving measure (Orange and Cohen 2010). In essence, greenwashing is when a company feigns or overstates the true magnitude of its green efforts to benefit its own reputation.

The main challenge in improving the quality of sustainability reporting is finding reliable and valid measurement methodologies for environmental, social, and governance (ESG) variables. While many standard setting bodies (SSBs) and financial sector regulators have greenwashing on their radar, application of financial technology can ensure avoidance of greenwashing while at the same time supporting increasing competition.

The following are a few examples of the application of financial technology:

- a. ClimateBert, an artificial intelligence (AI)-powered deep neural language model created by Swiss and German academics, is a natural language processing (NLP) tool developed specifically to target corporate reporting and disclosures (Bingler, Kraus, and Leippold 2021).

Continue on the next page

48 For literature on rating shopping, see Griffin, Nickerson, and Tang (2013); Skreta and Veldkamp (2009).

- b. The Financial Stability Board used an AI tool to examine companies' financial disclosures and score them in its 2020 status report to determine whether firms' reports include information that appears to align with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). It reviewed financial filings, annual reports, integrated reports, and sustainability reports. The AI technology used was trained on a set of labeled data comprising passages of text or excerpts identified as being in line with the 11 disclosures recommended by the TCFD. A different AI model incorporating computer vision techniques was used for the 2021 status report to identify thousands of paragraph passages, which needed to be narrowed down to only those relevant to climate-related disclosures. At the end of this process, a language model fine-tuned for climate disclosure classification was used to determine whether an entity's report aligned with each of the TCFD's 11 disclosures.
- c. The Financial Conduct Authority (FCA UK) will be among 13 international regulators (so far) taking part in the Global Financial Innovation Network's (GFIN) first-ever Greenwashing TechSprint, which was launched on June 5, 2023.* The objective of the TechSprint is to develop a tool or solution that can help regulators and the market effectively tackle the risks of greenwashing in financial services, given that the number of investment products marketed as green or making wider sustainability claims is growing with exaggerated, misleading, or unsubstantiated claims about ESG credentials.

While lack of assessment accuracy due to insufficient training data is the obvious challenge to any AI-generated evidence (in addition to the usual risks of excessive reliance on any technology-enabled application), consistently structured data will arguably no longer be scarce as climate risk disclosures are on track to become mandatory in some countries.

* See Greenwashing TechSprint, GFIN, <https://www.thefin.com/greenwashing-1>.

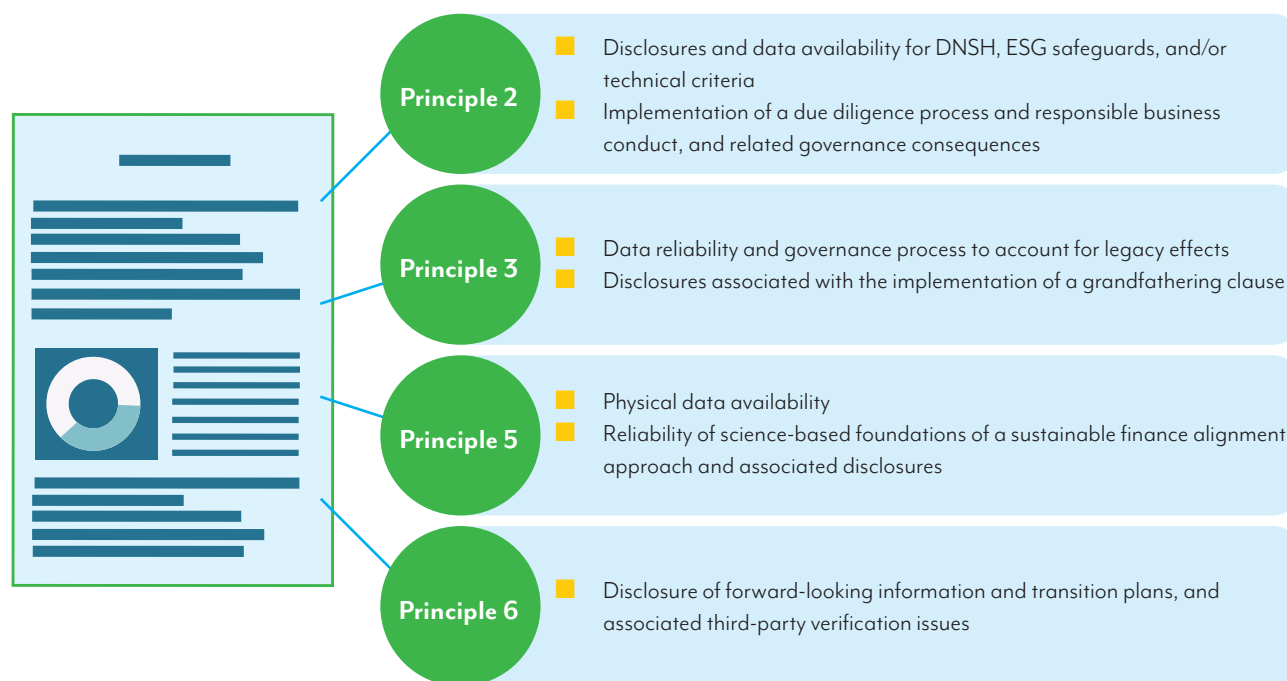
C. METHODOLOGICAL SUGGESTIONS TO APPLY THE PRINCIPLE

To promote quality, consistency, and reliability in disclosures related to sustainable finance alignment approaches, policy makers, financial authorities, and central banks—within their mandates—can consider the following strategies:

- **Support the consistent and transparent use of climate-related metrics to foster greater quality and comparability across jurisdictions and industries.**
- **Gradually work toward mandatory disclosure requirements to reduce market uncertainty and** promote the availability and use of reliable, comparable, and high-quality data.
- **Require entity-level as well as activity-level information to prevent greenwashing and assess companies' broader alignment to national, regional, or global industry-specific climate-related targets.**
- **Encourage disclosure of forward-looking information, including interim targets and transition plans.**
- **Ensure effective, high-quality external review.**
- **Provide clear and proportional guidance to support the scope, format, and frequency of information** (including forward-looking information) to be disclosed.

Figure 23 shows connections between Principle 4 and Principles 2, 3, 4, and 5.

Figure 23: Connections between Principle 4 and the other G-20 Principles



Source: Original figure for this publication.

Notes: DNSH = do no significant harm; ESG = environmental, social, and corporate governance.

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PRINCIPLE

5

Be science based for environmental goals and science or evidence based for other sustainability issues.

- A. Operational Issues**
- B. Key Takeaways from Technical and Comparative Analysis**
- C. Methodological Suggestions to Apply the Principle**

Alignment approaches should be objective in nature and should be supported by clearly defined and disclosed metrics, thresholds, or technical screening and assessment criteria that align with the best available science and technologies. Where possible, they should be internationally interoperable. When science-based metrics are not feasible, approaches should be fact based and subject to verification. A scientific basis is particularly relevant to environment- and climate-related alignment approaches, but objective evidence should support approaches and tools that address some other sustainability issues, especially social and governance issues. This is even more important to ensure that alignment approaches are flexible and dynamic enough to account for evolving and augmented scientific and technological developments as well as unfolding climate and environmental issues. Ensuring the science-based nature of alignment approaches requires mechanisms that facilitate continuous monitoring, evaluation, and learning, particularly when decisions are made under uncertainty (see Principles 3 and 4). Setting high-ambition science-based targets

also allows alignment approaches to be connected to climate goals at the country, regional, and/or global level and to send a strong signal to financial market participants to catalyze climate ambition, drive innovation, and allow for the necessary deployment of decarbonization technologies, processes, and activities.

A. OPERATIONAL ISSUES

Design of the Sustainable Finance Alignment Approach

- **Choosing a science-based driver in the design of the alignment approach.** In addition to setting objectives for the design per se, alignment approaches follow a reference point that can be either a normative source or a driver of a strategic and/or scientific nature (for example, national and/or regional development priorities, SDGs, or temperature objectives of the Paris Agreement).
- **Defining a scientific baseline and ensuring that it is incorporated into the criteria setting.** This is often defined alongside Principle 1 (material positive contributions) and the election of climate or carbon neutrality objectives, or both, for the alignment approach. The choice of science-based metrics is a complex issue, as it involves a series of intricate methodological consequences. (For example, opting for a carbon neutrality objective across the value chain involves the coverage of Scope 3 GHG emissions and the application of a life cycle analysis approach, while also taking into consideration the role of negative GHG emissions.)
- **Ensuring that the alignment approach is embedded in science.** This has significant consequences for (a) sectoral coverage, (b) revision of the criteria over time to align with evolving scientific and technical developments, and (c) applying a transition approach in criteria setting, disclosures, and implementation of the alignment approach.
- **Ensuring a close link to Principle 2** (avoiding negative contributions) and the application of a “do no significant harm” criterion and/or minimum safeguards, considering the latest scientific knowledge and related scientific, technical, other social developments. The need to guard against harm leads to subsequent methodological issues to ensure that a science-based (or evidence-based) approach is applied when a measure cannot capture the contribution to a sustainability goal (for example, weighting of a range of key performance indicators).

Disclosures and Data (in relation to Principle 4)

- **Embedding measurement (and/or accounting) methodologies in science to ensure science-based disclosures.** The role of verifiability is key owing to the technical nature of the metrics, data points, and underlying methodologies—and to reporting in general. The choice of accounting standards (for example, GHG accounting) to inform reporting under science-based criteria is significant.
- **Basing the alignment approach on a due and adequate verification process.** Potential minimum auditing standards may be desirable to allow for a minimum level of assurance of this principle.
- **Interoperability issues stemming from the major differences in quality, comparability, and reliability of data** (specifically physical data) across the spectrum of economies, for which significant data gaps exist—as referenced by the literature. Different starting points and objectives in achieving climate-related goals (for mitigation and adaptation purposes) involve differences in the way alignment approaches are implemented.

B. KEY TAKEAWAYS FROM TECHNICAL AND COMPARATIVE ANALYSIS

As described in Principle 4 (governance), most alignment approaches involve a variety of strategic objectives, with a few of them being directly embedded in science. Some may leverage the alignment approach in the design and structuring of solutions and services to accelerate (a) the development of low-carbon sectors and activities and (b) decarbonization efforts in the economy.

Yet although these objectives closely influence the design and the disclosure-related features of the alignment approach, they are not always coupled with a science-based driver. Such drivers may take a variety of forms (which are generally noncomplementary), such as the following:

- Scenarios, with variations in terms of sector and geography coverage.

Scenarios simulate possible alternative outcomes that could happen, often involving a comparison with forecasts assuming that the status quo continues—for instance, the economic effects of global temperature changes under different climate pathways (Hendry and Pretis 2023).

As such, they aim to operationalize a given carbon budget (Institut Louis Bachelier 2020) by attempting to distribute the remaining carbon budget on a temporal, geographic, or sectoral basis to achieve a given decarbonization and temperature limitation objective. “Carbon budgets, which are specified by scientific climate scenarios, ultimately form the back-bone of portfolio alignment tools” (TCFD Portfolio Alignment Team 2021, 58). Scenarios may therefore be used as underlying inputs to the metrics of alignment approaches, particularly at the portfolio level (including portfolio warming metrics and deviation from pathways). They range from global sector-agnostic benchmarks to more granular pathways and target-setting frameworks. They cover different decarbonization trajectories and aim to remain consistent with both climate science and the latest decarbonization efforts in the economy, with varying levels of granularity.

For portfolio-level approaches that aim to translate GHG emissions to a temperature score, methodologies rely on the assessment of the alignment of GHG emissions against one or a series of temperature pathways. They aim to assess the performance of a corporate asset as the deviation from a GHG emissions pathway associated with a given temperature. This translation into a “carbon budget overshoot”⁴⁹ then leads to a certain temperature score based on a whole-economy assumption.

Variations observed are related to the differentiated degree of detail—at the geographic or sectoral level—of the temperature pathway, or benchmark.

- ◆ **Some portfolio-level approaches rely on global and sector-agnostic scenarios** (for example, the use of IPCC pathways⁵⁰), which are the simplest approaches to assess large and diversified portfolios. With these approaches, the entire portfolio should decarbonize at the same rate as the overall economy needs to decarbonize to be considered as aligned with a given temperature trajectory. For example, *Global Warming of 1.5°C* (IPCC 2018) provides users with a 1.5°C trajectory with no or limited overshoot. This is most suitable for portfolio methodologies

49 For further details on the carbon budget, uncertainties in the carbon cycle and the climate response, and methods to quantify GHG emission budgets for the 2000–50 period that would limit warming throughout the twenty-first century, see Meinshausen et al. (2009).

50 The assessed pathways describe integrated, quantitative evolutions of all emissions over the twenty-first century associated with global energy and land use and the world economy. Pathways consistent with 1.5°C of warming above preindustrial levels can be identified under a range of assumptions about economic growth, technology developments, and lifestyles. These are developed in Rogelj et al. (2018).

seeking alignment with the temperature objectives of the Paris Agreement (1.5°C or well below 2.0°C compared with preindustrial temperatures).

- ◆ **Some other approaches may vary by geography and by sector** (for example, use of the IEA scenarios, given their high level of sector disaggregation and coverage and their related production data availability. Underlying assets therefore decarbonize within their given sector and converge to a shared sector average under a scenario. These differences have consequences for the warming estimates, considering the varying degrees of portfolio exposures across geographies and sectors (Institut Louis Bachelier 2020; TCFD Portfolio Alignment Team 2020).

Portfolio alignment and temperature methodologies—often developed by data providers and investors—therefore use IPCC sector-agnostic and/or IEA sector-specific scenarios. These have been well detailed by Institut Louis Bachelier (2020, 35–39 [table 6]).

- ◆ **The Science Based Targets initiative (SBTi)⁵¹ is also a commonly used company-level method.** One of SBTi's objectives is to “define and promote best practice in science-based target setting.”⁵² Science-based targets are indeed GHG emissions reduction targets that are aligned with reduction trajectories for limiting temperature rise to the Paris Agreement objectives. Measuring portfolio alignment temperature often builds on SBTi methods at the company level for target setting.
- ◆ **Among other methods to derive science-based targets, the SBTi provides the Sectoral Decarbonization Approach (SDA).⁵³** The SDA aims to support companies in homogeneous, carbon-intensive sectors in aligning their GHG emissions reduction targets with climate science by allocating the global carbon budget to sectors and subsectors of the economy.
- ◆ **The method is based on the 2°C scenario, one of the IEA's detailed CO₂ sector scenarios** modeled in its 2014 *Energy Technology Perspectives* report (IEA 2014; consistent with the IPCC's representative concentration pathway 2.6 [RCP2.6] scenario⁵⁴). Sectoral pathways are available for a wide range of key industry sectors (for example, aluminum, cement, commercial buildings, iron, power generation, pulp and paper, steel, and transportation). The SDA method considers inherent differences among sectors—that is, mitigation potential and sectoral growth potential relative to economic and population growth. Within each sector, companies can derive their science-based GHG emission reduction targets on the basis of their relative contribution to the total sector activity and their carbon intensity relative to the sector's intensity in the base year. As such, this method recognizes that different sectors of the economy face different transition challenges (which depend on where GHG emissions are concentrated in the value chain) and that different emissions have varying cost reduction potential. In the SDA method, target GHG emission intensity therefore varies according to company base year emission intensity, projected activity growth, and sectoral budget.

Other methods that are available as part of the SBTi and are commonly used include (a) methods by which companies are required to reduce their GHG emissions per value added by 7 percent per year (compounded) and (b) absolute contraction methods by which all companies reduce their absolute emissions at the same rate, regardless of initial emissions performance. Another commonly used method is the Transition Pathway Initiative,⁵⁵ a global, asset owner-led methodology that assesses companies on two dimensions based on publicly available information: management quality and carbon performance. The carbon performance module evaluates how companies' current

51 See Science Based Targets initiative (2019).

52 Science Based Targets initiative, “About Us,” [https://sciencebasedtargets.org/about-us#:~:text=The%20Science%20Based%20Targets%20initiative%20\(SBTi\)%3A,with%20the%20latest%20climate%20science](https://sciencebasedtargets.org/about-us#:~:text=The%20Science%20Based%20Targets%20initiative%20(SBTi)%3A,with%20the%20latest%20climate%20science).

53 See Science Based Targets initiative (2015).

54 For further details on RCP2.6, see van Vuuren, Stehfest et al. (2011).

55 See Dietz et al. (2021).

and future carbon performance may compare to the Paris Agreement temperature targets and NDCs. It is based on the SDA and compares companies in carbon-intensive sectors with each other and with sector-specific benchmarks, which establish the performance of an average company that is aligned with the temperature goals of the Paris Agreement.

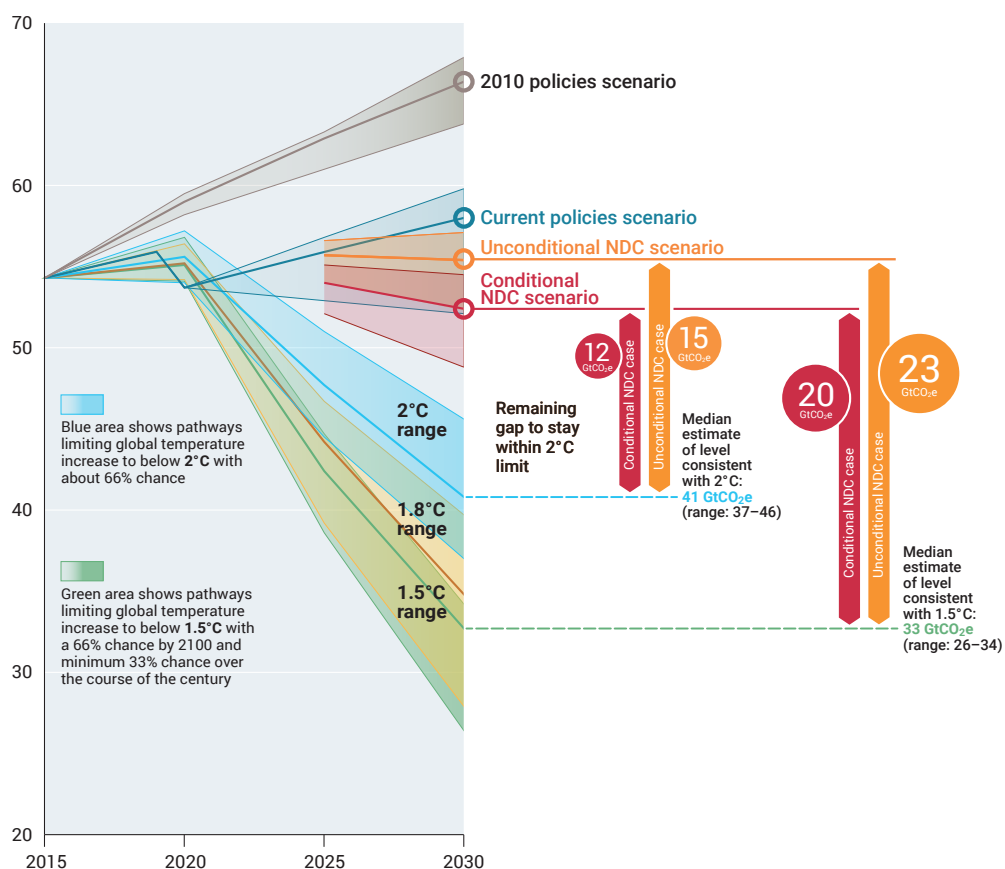
- NDCs in line with the Paris Agreement.

Often, taxonomies use the country’s NDC⁵⁶ as a driver for the design of the objectives, sectoral coverage, and criteria (for example, for Bangladesh, Colombia, Indonesia, Malaysia, Mongolia, the Republic of Korea, and South Africa).

An increasing reliance on NDCs, for both consistency and feasibility purposes in the design of taxonomies (especially), leads to two key issues that are critical to closely consider when assessing the science-based nature of alignment approaches.

- ◆ **The first key issue is the so-called climate ambition gap**—that is, the gap between the GHG emissions reductions promised and the emissions reductions *needed* to achieve the temperature goals of the Paris Agreement (figure 24).⁵⁷

Figure 24: GHG emissions under different scenarios and the emissions gap in 2030



Source: UN Environment Programme 2022.

Note: GHG = greenhouse gas; GtCO₂e = billions of tonnes of global annual CO₂ equivalent emissions; NDC = nationally determined contribution.

56 See CCAP (2022) and NDC Partnership (2020).

57 See Black et al. (2021).

Understanding the rationale behind the choice of an NDC as a strategic driver to design an alignment approach, such as a taxonomy, is crucial because of the complexity of this climate ambition gap. This has been especially true since COP26 (the 2021 United Nations Climate Change Conference), which has been widely seen as a milestone for ratcheting up ambition. More than 120 countries have upgraded their 2030 targets, and major emitters representing more than 70 percent of global CO₂ emissions announced and/or adopted net-zero commitments at this occasion (Höhne et al. 2021).

Critical research by van de Ven et al. (2023, 576) shows that if announced national near-term (2030) and longer-term (2050–70) GHG emissions reduction ambitions throughout the world are achieved, global peak temperature increase will stay below 2°C with approximately 75 percent certainty. In particular, the research notes the following:

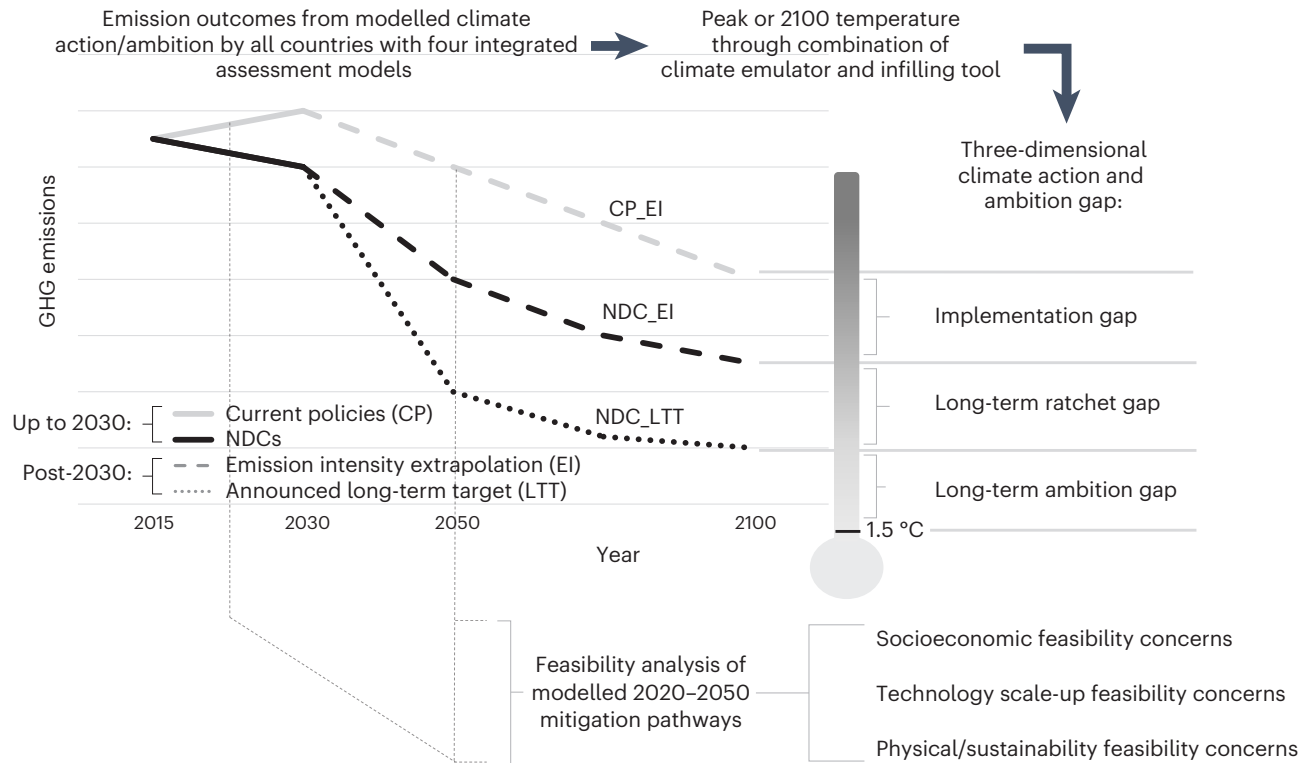
- If “climate action is not strengthened post-2030, long-term ambitions will not be achievable (long-term ratchet gap) and global temperature increase will be around or above 2°C by 2100 [...] sufficiently strong to activate several climate tipping elements.”⁵⁸
- According to the current pace of policy implementation, global GHG emissions are set to peak in the current decade with current NDCs. It is therefore critical that current NDCs be applied, which is the minimum level of ambition, but also be strengthened in order to achieve long-term climate-related goals.
- Mitigation pathways in line with NDCs face “substantial feasibility challenges, either in socioeconomic, technology scale-up, physical or sustainability dimensions.” The authors note that these are not insurmountable challenges but rather should be seen as “areas where additional policy support or breakthroughs in technology or consumer behavior may be needed.”
- Therefore, “the short- and long-run implementation of the existing set of ambitions is currently the most relevant factor to avoid a climate disaster.”⁵⁹

58 For further details on the suite of emissions pathways showing that ratcheting near-term ambition through 2030 will be crucial to limiting peak temperature changes, refer to Iyer et al. (2022).

59 “To our knowledge, the article by van de Ven and coauthors is the first to employ four different (Integrated Assessment Models) IAMs to assess the climate mitigation impact of the Glasgow commitments and to systematically identify possible region-specific feasibility challenges. It provides a robust assessment of the temperature impacts of existing climate policies, of medium-term commitments for climate action by 2030 and of longer-term pledges such as mid-century strategies. The authors highlight that current policies are not sufficient to achieve the 2030 goals defined in the NDCs submitted in Glasgow. They also point out that even a full implementation of the NDCs will not be sufficient to reach the Paris Agreement’s long-term goal. The mid-century commitments by major emitters also need to be fulfilled, and even this would probably not be enough to keep global warming below 1.5 °C,” in Pianta and Brutschin (2023). Refer to van de Ven et al. (2023).

See figure 25 for an illustration of gaps in climate action between 2015 and 2100.

Figure 25: Breakdown of the climate action gap in an implementation gap, a long-term ratchet gap, and a long-term ambition gap

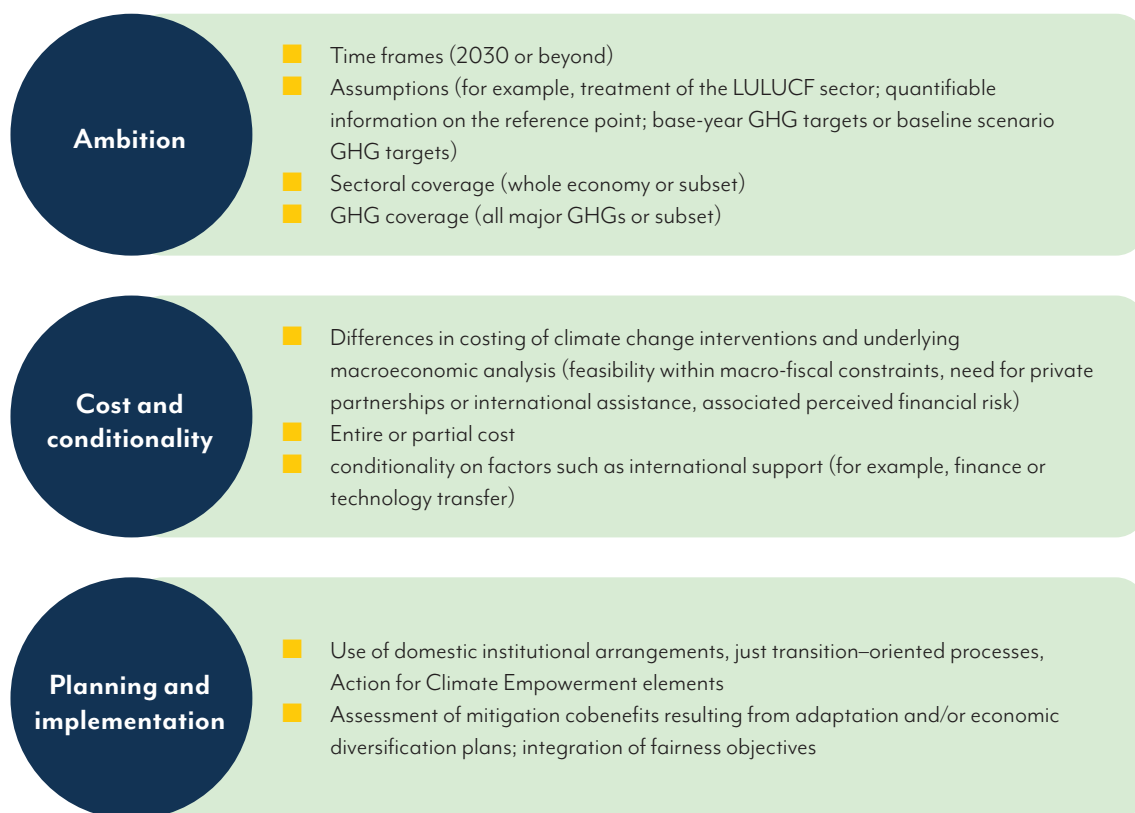


Source: van de Ven et al. 2023.

Note: Implementation gap: temperature difference between current policies and NDCs. Long-term ratchet gap: temperature difference between NDCs followed or not by long-term targets. Long-term ambition gap: difference between temperature achieved by long-term targets and the 1.5°C goal. GHG = greenhouse gas; NDCs = nationally determined contributions.

- **The second key issue is understanding the main differences across NDCs (see figure 20).** These can be drawn from two critical documents: *The Closing Window: Climate Crisis Calls for Rapid Transformation of Societies* (UN Environment Programme 2022) and the *2022 NDC Synthesis Report* (UNFCCC 2022).

Figure 26: Synthesis of main differences across NDCs



Source: Original figure for this publication based on UN Environment Programme 2022 and UNFCCC 2022).

Note: GHG = greenhouse gas; LULUCF = land use, land-use change, and forestry; NDCs = nationally determined contributions.

These distinctions across NDCs are key, in terms of the following:

- **Ambition.** For instance, increasing near-term climate ambition may imply achieving greater reductions in *non-CO₂* emissions, given that some (for example, methane) have higher global warming potential and shorter atmospheric lifetimes and therefore play an important role in both stabilizing long-term temperature change and limiting peak near-term warming, yet NDCs that do not include non-CO₂ emissions would potentially have more limited effects in the near term.
- **Implementation.** Divergent assumptions about the role of the land use, land-use change, and forestry (LULUCF) sector, for instance, may lead to differentiated approaches in covering this sector as part of an alignment strategy. Limited sectoral coverage would also have significant practical consequences for the ambition of NDCs and therefore potentially underlying alignment approaches.

So when taxonomies use the NDC as a strategic driver, climate-related goals may vary: GHG emission reduction levels would differ across taxonomies as well as target years (2030, 2050). That is why it is critical to assess the science-based nature of the alignment approach with regard to the ambition of the NDC, its underlying characteristics, and its revision over time.⁶⁰

- Key reference policy targets, preestablished in regional and/or national regulations (often of a sectoral nature).

Sometimes taxonomies (but also other alignment approaches at entity and portfolio levels) will be based on high-level policy objectives that are not directly related to the NDC. This is the case for regional taxonomies such as the EU's and the ASEAN's, but also for China's taxonomy (whose high-level policy objective is the Integrated Reform Plan for Promoting Ecological Progress). In addition, specific sectoral road maps may sometimes be chosen, mostly in cases where a whitelist approach has been chosen to define the sectoral coverage (for asset-level approaches). These choices may affect the ambition of the climate-related goal.

In this context, disclosure-related consequences of applying a science-based approach are mostly overlooked across existing alignment approaches, as only a few of them require due verification process and embed a science-based principle into the data features of the approach.

⁶⁰ In addition, it is worth noting the role of finance ministers in the economic assessments of proposed policies to ensure that climate risks and opportunities are being factored into decision-making. Considering their dual role in the NDC process and in supporting the development of alignment approaches it is crucial that sound costing of NDCs helps identify least- and low-cost pathways for a low-carbon transition and climate-resilient strategies. Financing needs for NDCs are also determined through this process, and attracting private sector financing for NDC projects and programs through investor-friendly policies and regulations is key. See Coalition of Finance Ministers for Climate Action (2020, 2022).

C. METHODOLOGICAL SUGGESTIONS TO APPLY THE PRINCIPLE

- **The rationale behind the alignment approach design should be clearly laid out**—and with it, the advantages and disadvantages of the different science-based drivers of alignment approaches, as well as their methodological challenges.
- ◆ **By science-based driver, for the climate mitigation objective, alignment approaches would aim to collectively⁶¹ keep cumulative GHG emissions within the carbon budget** associated with the Paris Agreement warming target.

As far as NDCs are concerned, box 5 may act as a basis for discussion for authorities designing or revising an alignment approach.

61 See Davasse (2022) on the distinction between company-level carbon-neutrality claims and a transparent and proportionate communication of the firm's contribution to collective carbon neutrality.

Box 5: Issues to be considered when choosing an NDC as a strategic driver for alignment

Using an NDC as a strategic driver for alignment

- The NDC acts as a **bridge between national priorities for mitigation and alignment approaches, especially those at asset level and entity level**. It allows for tailoring to the national and/or regional context. If the NDC has been underpinned by relevant macroeconomic analysis, it has a better chance to develop an achievable set of targets in the short to medium term and therefore to provide a robust foundation for target setting as part of an alignment approach.
- An **NDC ensures greater policy predictability and transparency**, which are extremely relevant for emerging markets and developing economies and for low-income countries.
- The **potential inclusion of domestic institutional arrangements and just transition-oriented processes in an NDC is a positive input** in alignment approaches. It contributes to (a) grounding the alignment approach in a preexisting favorable institutional context, contributing to a sound governance process, and (b) the inclusion of essential just transition considerations in the design, criteria, and governance process of the alignment approach. Impact assessments of NDCs are also useful contributions.
- An NDC serves as a **focal point with financing institutions and partners** and is therefore able to play a useful role for financial institutions' take-up of alignment approaches once the approaches are designed.
- An NDC is often revised to **optimize financing and decarbonization needs within fiscal constraints**, which allows the prioritization of decarbonization projects and enhancement of dialogue with financing partners.

Areas that warrant close consideration and transparency if an NDC is used

The climate ambition gap between an NDC and international temperature goals (see section B) requires attention. In the *Alignment Cookbook* report, Institut Louis Bachelier (2020, 47) notes that the NDCs cannot be used directly to derive 2°C benchmarks for temperature alignment assessments because they do not limit temperature rise under 2°C. The authors conclude that “using them as benchmarks require[s] extra manipulation, which creates uncertainty.”

Continue on the next page

- **NDCs' characteristics can add difficulties to ensuring the science-based and predictability needs of an alignment approach**, especially given (a) the integration of political economy and socioeconomic considerations into NDCs and their difficult application to the unfolding of asset-level approaches, (b) an often broad scope that may be at odds with the level of granularity and the identification of transitional assets and/or activities in alignment approaches, and (c) the moving target of NDCs that may be at odds with the predictability objective in applying alignment approaches within the financial sector.
- Fransen et al. (2019) note the following, **aiming to achieve greater convergence among NDCs**:
 - ◆ **Seeking a closer link between updated projections of future GHG emissions in NDCs and GHG emission indicators** linked to national inventory reports
 - ◆ **Maximizing mutual benefits with other development objectives and addressing potential trade-offs with objectives** such as energy access; access to affordable, sustainable transportation and mobility; improved air quality and health outcomes; reduced damages from climate-related disasters through adaptation measures; climate-appropriate green jobs and/or just transition programs and investments; and health-related and gender-related objectives (Relation with Principle 2)
 - ◆ **Greater information on socioeconomic trends** (including, but not limited to, just transition and other SDGs) (Relation with Principle 1)
 - ◆ **The provision of more granular sectoral and technological indicators** (Relation with Principles 1 and 6)
 - ◆ **The inclusion of national and regional plans and policies** (that is, legislation and policy, national development plans, sector-specific plans and policies, long-term climate strategies, and SDG implementation plans) (Relation with Principles 1 and 4).

These elements are critical for understanding what the potential gaps of NDCs may be. The solutions provided by Fransen et al. to bridge these gaps may serve as useful tools to complete the NDCs with relevant policy indicators and objectives.*

Note: NDC = nationally determined contribution; SDG = Sustainable Development Goal.

* Fransen et al. (2019) suggest drawing on the following resources: (a) the Initiative for Climate Action Transparency's Sustainable Development Guidance, which provides guidance for assessing the environmental, social, and economic impacts of climate-related policies and actions, including both qualitative and quantitative assessments; (b) the United Nations Development Programme Climate Action Impact Tool, which provides a framework for considering the development impacts (including for the SDGs, of climate actions at the program and project levels); (c) the SDG Climate Action Nexus tool, which provides mapping for the effects of various climate actions on achieving the SDGs; and (d) the Climate Watch database and the NDC-SDG Connections tool, which enable users to examine the ways in which targets and actions in existing NDCs are relevant for SDG-related objectives, which can then be considered in the development of enhanced NDCs.

- **As box 5 suggests, an NDC is a useful *strategic* driver in the design of an asset- or entity-level alignment approach.** However, it remains critical that any alignment approach using a NDC as a strategic driver makes full transparency of necessary adjustments to fill the climate ambition gap and address potential gaps with a Paris Agreement-aligned pathway.

Countries' long-term climate mitigation perspective (included in long-term low-GHG emission development strategies or other national [sectoral] long-term strategies) may also drive and shape short-term action (OECD and IEA 2020).⁶² As such, linking NDCs and long-term low emissions development strategies (LT-LEDS) from a climate mitigation perspective means that, ideally, the mitigation targets put forward by an NDC would be concrete milestones along the low-emissions pathway resulting from the long-term strategy. Linking NDCs and LT-LEDS may therefore usefully drive alignment approaches.

As for underlying scenarios, sectoral road maps, and/or decarbonization pathways, it is essential to clarify several methodological features. These may involve caveats from a climate and environmental integrity perspective as well as an interoperability perspective, as follows:

- **On the choice between sector- and geography-agnostic versus sector- and geography-specific methods for portfolio-alignment approaches,** the following should be considered.

As reflected by Institut Louis Bachelier (2020) and I4CE (Cochran and Pauthier 2019; Colin, Vailles, and Hubert 2019), the choice of one or several scenarios and associated trajectories would depend on a range of conceptual and practical considerations. Most of the time, data providers and investors use the most “practical” scenarios rather than those best suited to the assessment question, from a conceptual point of view.

- ◆ **Sector- and geography-agnostic methods contribute to increasing the accuracy of portfolio warming metrics** because there is inherent uncertainty about desired future decarbonization pathways that characterize sector- and geography-specific methods. These methods are also useful for financial market participants because of their broad coverage.
- ◆ **On the other hand, sector- and geography-specific methods also benefit from expanded sectoral coverage and regular updates.** The methods are prone to better reflect different regions and sectors' abilities and needs to decarbonize. As underlined by the TCFD Portfolio Alignment Team (2021), they also allow hard-to-abate sectors and regions to decarbonize at a slower rate than others, which reduces deviation from benchmarks and translates GHG emissions for those sectors into lower temperature scores. That lenience contributes to increased capital flow to those sectors and regions and more effectively supports the identification of those sectors and regions that are leading or lagging. This is also relevant for methods that aim to assess portfolios with a large—or relatively large—exposure to sectors for which specific decarbonization trajectories exist (for example, the energy production sector).

62 LT-LEDS are indeed long-term national strategies that identify opportunities or pathways for low-emission development and that also consider broader socioeconomic goals. Although NDCs are mandatory for all parties to the Paris Agreement, LT-LEDS are voluntary, Milestone targets are usually set for 2025 or 2030, frequently corresponding to or more ambitious than the targets put forward in the NDC. The OECD suggests how a long-term climate mitigation perspective can influence short-term action, by (a) helping define strategic areas where action in the short to medium term is crucial for achieving long-term goals; (b) unlocking long-term mitigation opportunities (for example, early action and careful sequencing of short- and medium-term measures that are needed to scale up carbon capture, utilization, and storage [CCUS] technologies); (c) providing strong political signal and support for action in the short to medium term; and (d) avoiding or reducing the risk of locking in GHG emissions. See OECD and IEA (2020).

- **On the need to adjust scenarios**, the following should be considered.

Since these scenarios do not initially aim to support portfolio-level alignment approaches, they are not necessarily perfectly suited for this type of exercise in their scope or outputs. Therefore, as highlighted by the Institutional Investors Group on Climate Change (IIGCC), “understanding the assumptions behind scenarios and the methodologies used to apply them to investments is critical. These assumptions drive the results. Without knowing how they work, the outputs of assessment will be challenging to rely on for investment purposes” (IIGCC 2018, 7). Understanding the rationale behind their design is a necessary step.

Among a series of practical lessons from a scientific perspective, the *Alignment Cookbook* (Institut Louis Bachelier 2020) usefully describes two main categories of scenarios and trajectories that are available to financial market participants in the context of portfolio alignment assessment:

- ◆ **Agnostic trajectories**, provided by the IPCC Representative Concentration Pathways (RCPs).⁶³

In addition to providing access to data, and a fixed 1.5°C trajectory provided by the IPCC, these scenarios are easy to use for sector-agnostic portfolio alignment approaches, given the low level of emissions data disaggregation across sectors and the lack of sector-specific physical and economic data across RCPs.

- ◆ **Technology and economy scenarios**, notably provided by the IEA.⁶⁴

The high output data availability and granularity and frequent updates of these scenarios have allowed wide use of the scenarios across financial market participants. IEA scenarios benefit from a high level of sectoral and regional disaggregation and of sector coverage. In addition, given that several IEA scenarios are based on the same models, leading to different temperatures targets, the scenarios provide a consistent set of trajectories.

- **In addition to understanding the rationale and outputs of scenarios used, as they influence the alignment approaches’ pathways** and, ultimately, their comparison with portfolios’ climate performance, considering the lessons of the *Alignment Cookbook* (Institut Louis Bachelier 2020) is suggested, particularly the following:

- ◆ **Table 15 on the main trade-offs in temperature alignment methodologies**, including the choice of metric, the value chain perspective, the inclusion of removed and avoided emissions, and the choice of scenarios and trajectories

- ◆ **The “Main Course” section**, describing how to choose a scenario or scenarios and how to adapt one or more externally derived scenarios.

The lessons learned from Rekker et al. (2022) on the different allocation methodologies (including the SDA) and their compliance with the Paris Agreement are also important to **consider when developing such portfolio alignment approaches while ensuring that their underlying decarbonization pathway is consistent with a target of well below 2°C.**

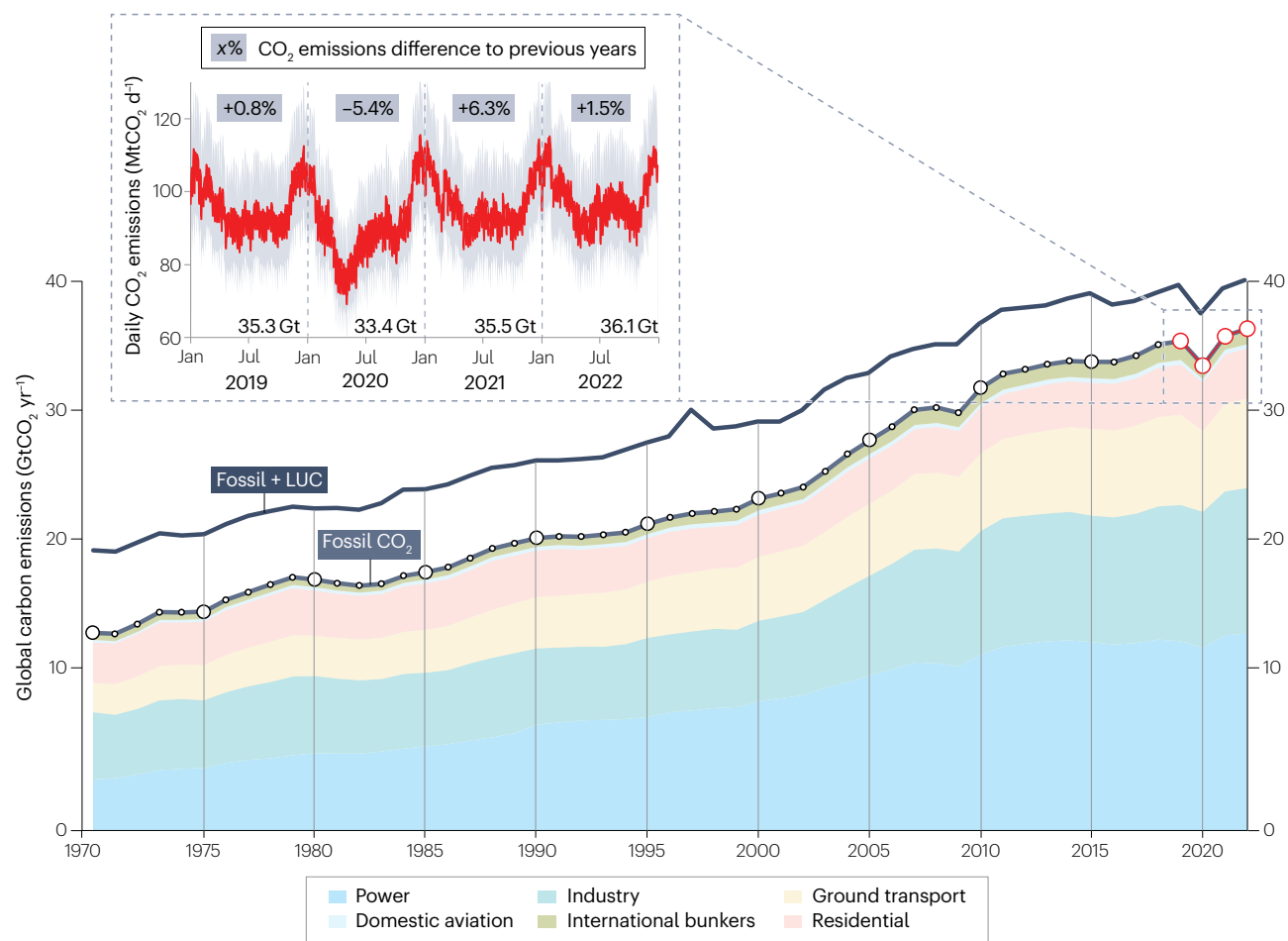
63 RCPs are a scenario set containing emission, concentration, and land-use trajectories. According to van Vuuren, Edmonds et al. (2011), “Two important characteristics of RCPs are reflected in their names. The word ‘representative’ signifies that each of the RCPs represents a larger set of scenarios in the literature. In fact, as a set, the RCPs should be compatible with the full range of emissions scenarios available in the current scientific literature, with and without climate policy. The words ‘concentration pathway’ are meant to emphasize that these RCPs are not the final new, fully integrated scenarios (i.e. they are not a complete package of socio-economic, emission and climate projections), but instead are internally consistent sets of projections of the components of radiative forcing that are used in subsequent phases.”

64 See IEA scenarios and their underlying model(s) in IEA (2022).

- **More broadly, ensuring the scientific alignment of Paris Agreement–alignment approaches, underlying assumptions, and supporting metrics means that an analytically rigorous review process must be applied** to ensure consistency with climate science. Scenarios that are sector- and geography-agnostic, and those that are sector- and geography-specific, should be updated regularly, ideally on an annual basis, to reflect climate science and the latest decarbonization efforts.

See figure 27 for a historical view of carbon dioxide emissions from key sectors of the economy.

Figure 27: Historical CO₂ emissions from key sectors of the economy, between 1970 and 2022



Source: Liu et al. 2023.

Note: CO₂ = carbon dioxide; Gt = gigaton; GtCO₂ = gigatons of CO₂; LUC = land use change; MtCO₂ = metric tons of carbon dioxide. Global CO₂ emissions continue to grow after a brief decline in 2020. If this increase persists, it will use up the remaining 1.5°C carbon budget within two to seven years.

Full consideration of the policy implications of a finite carbon budget is a key step to ensuring the science-based nature of an alignment approach (see Liu et al. 2023).

These policy implications include the need to maintain a net-zero objective in order to stabilize global temperature, across all GHGs, according to Matthews et al. (2020, 19). Consistency with the Paris Agreement temperature goals means that a net-zero emission target must also be supported by “aggressive mitigation of non-CO₂ emissions, such as methane, nitrous oxide, and black carbon.”

Research shows that most of the reduction in carbon budgets is a result of the direct warming effect of the non-CO₂ emissions, with a secondary contribution from the influence of the non-CO₂ emissions on the carbon cycle. Given the increasingly important role in climate change mitigation policy, understanding the influence of non-CO₂ emissions on these budgets and their uncertainties is critical. Recent research has therefore heavily focused on non-CO₂ emissions: the eventual size of the effective carbon budget will be highly influenced by human decisions and in particular by people’s ability to mitigate emissions of short-lived greenhouse gases and aerosols. This is why it is critical that alignment approaches fully incorporate *all* types of GHGs in their design and assessment.

Figure 28 discusses the use of science-based alignment approaches.

Figure 28: Guaranteeing the science-based nature of alignment approaches



Setting an ambition in line with the Paris Agreement (well below 1.5°C and 2°C at most)

- The strategic driver chosen must ensure that, if it were widely adopted, it would keep cumulative GHG emissions within the carbon budget associated with the Paris Agreement temperature targets.
- Alignment approaches at all levels (those with a low-carbon trajectory) must lead to an actual reduction of GHG emissions in the real economy, and not a redistribution of emissions between sectors, companies, and financial market participants.
- A common set of principles is needed for scenario selection: a limit on carbon dioxide removal assumptions to lead to more aggressive decarbonization requirements; a limited carbon budget according to the latest climate science with a cap on total GHG emissions through 2100; and limited temperature overshoot assumptions.
- Non-CO₂ emissions must be included in parameters of alignment approaches.



Robust science-driven governance, full disclosure of data gaps and potential “climate ambition gaps,” and credibility of alignment approaches

- The governance process of alignment approaches must ensure that they are based on the best available and peer-reviewed climate science. Climate scientists and modelers, country and regional authorities and policy makers, and financial market participants must collaborate on the parameters of underlying climate scenario models ultimately used for alignment.
- All data on underlying assumptions and parameters of strategic drivers for alignment approaches should be fully disclosed and updated regularly.
- Any deviation from the warming targets should be fully disclosed and justified (including those related to NDC alignment).
- External validation of targets and alignment approaches’ main foundations is needed (see Principle 4).



Socioeconomic conditions and fairness challenges should not be overlooked when ensuring the scientific nature of alignment approaches

- Fairness and equity are issues that fully pertain to the alignment with warming targets. They are, however, not a scientifically driven choice and lie at the intersection between ethics, justice, history, society, and geophysics.
- Although such an exercise seems “fraught with value judgments which have little relation to the geophysical underpinnings of carbon budgets,” science can still inform and quantify the implications of what are largely subjective choices by individual countries or systems to distribute quotas among countries (Matthews et al. 2020). This is why international cooperation is needed to achieve an iterative process of evaluating and strengthening national carbon budgets.
- In the context of alignment approaches, reflecting the just transition characteristics described in Principle 1 is part of this process.

Source: Original figure for this publication

Note: GHG = greenhouse gas; NDC = nationally determined contribution.

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PRINCIPLE

6

Address transition considerations.

- A. Operational Challenges**
- B. Key Takeaways from Technical and Comparative Analysis**
- C. Methodological Suggestions to Apply the Principle**

Methodologies to align sustainable investments should consider how to support a credible and just transition to a low-emission and climate-resilient economy. By transition, we mean the fundamental interim process by which financial market participants, including nonfinancial companies, must transform their business model and activities to substantially decarbonize, ensure their environmental, social, and financial resilience and therefore adapt to a (warming) world under tight GHG emissions constraints. As a result, the transition is a forward-looking (referring to the time-bound decarbonization pathways to reach carbon neutrality goals, temperature alignment, or other environmental objectives) and holistic concept (that is, it has to be applied at the entity level).

Addressing transition considerations is challenging, given the unintended consequences it may entail—involving carbon lock-in, low-integrity investments and “greenwashing” risks, and rebound effects if solely based on reduced emissions intensity rather than on absolute emissions.

In this context, the effort to guarantee that alignment methodologies fully address transition considerations and capture transition dynamics includes identifying transitional assets; designing credible transition pathways; implementing relevant disclosures, including transition plans; and rolling out verification requirements.

A. OPERATIONAL CHALLENGES

Design of the Sustainable Finance Alignment Approach

- **Embedding transition into the alignment methodologies involves making complex choices regarding technical issues related to other Principles.** These include assessing material contribution to climate objectives and related methodological issues and sectoral coverage (Principle 1: material positive contributions); transition and legacy effects, revision of transition pathways and criteria over time (Principle 3: dynamic), and science-based drivers for the alignment approach; and assessment over time of the compliance of assets and activities (Principle 5: science-based). Criteria setting, for example, may be linked to existing sustainability road maps (for example, for a climate mitigation objective, in the form of decarbonization pathways⁶⁵) and energy-climate scenarios (for example, IPCC, including Shared Socioeconomic Pathways [SSPs] and International Energy Agency [IEA] scenarios). In addition, adjusting asset- and entity-level alignment approaches to the progression of an economy's transition (for example, adjusting emissions thresholds over time) may prove to be a complex exercise.
- **Deciding to exclude certain sectors, activities, or technologies in the design of an asset- and entity-level approach may be at odds with the transition concept per se.** Therefore, such exclusion involves careful choices (technical or science-based reasons for the exclusion, the distinction among carbon-intensive sectors, and how it fits with the overall objective of the alignment approach and its science-based drivers).
- **Applying the transition concept across a diverse range of sectors, activities, and assets in asset- and entity-level alignment approaches requires particular attention to national and regional circumstances** (location in supply chains, data availability and macroeconomic constraints in EMDEs and low-income countries, and so forth). Some aspects may render the transition more just or orderly⁶⁶ but remain credible (for example, inequality levels, level of technological development, availability of government budgets, and so forth). In the same vein, embedding *just* transition aspects may prove a difficult exercise (for example, in criteria setting and road map anchoring and their use⁶⁷). In addition, the specific challenges faced by fossil-fuel-exporting or fossil-fuel-dependent countries (beyond coal)⁶⁸ need to be accounted for.⁶⁹

65 For more information on SSPs, see Hausfather (2018). SSPs can indeed inform the setting of criteria, depending on different “baseline worlds” that might occur in the absence of any concerted international effort to address climate change, beyond those already adopted by countries. Underlying factors, such as population, technological, and economic growth, could indeed lead to very different future GHG emissions and warming outcomes, even without climate policy.

66 The OECD report *Financial Markets and Climate Transition* (2021) offers views on how, in an orderly transition, losses on carbon-intensive assets from the low-carbon transition could be offset by various positive effects, which could contribute to net gains. See section 2.2, “Getting the Balance Right to Navigate the Low-Carbon Transition.”

67 The UN Principles for Responsible Investment’s Inevitable Policy Response (IPR) project provides, for each IPR lever (such as net-zero targets, fossil fuel phaseout, and clean power), a series of solutions to integrate just transition into the implementation of that lever (such as in the design sector and place-based plans for workers and communities, finance reskilling, social protection and regional development, and so on). See Robins (2022).

68 Specific to coal, see Pai et al. (2021) and Bhat, Murray, and Mann (2023).

69 See Saha, Walls, Waskow, and Bergen (2023) and Saha, Walls, Waskow, and Lazer (2023). More specifically, the literature points to the challenges stemming from phasing out fossil fuels that entail the necessary destabilization of incumbent regimes while protecting those affected by the fossil fuel decline. Nacke, Cherp, and Jewell (2022) argue that “sequencing destabilization and just transition policies addresses three policy problems: phasing out fossil fuels, transforming affected industries, and ensuring socio-economic recovery in fossil resource-dependent regions.”

Disclosures and Data (in relation to Principle 3 and Principle 4)

- **Ensuring that disclosures and data carefully embrace the transition concept comes with challenges** linked to the level of detail in reporting, its forward-looking nature,⁷⁰ and its assessment and potential variability over time—especially at the asset and entity levels.

B. TAKEAWAYS FROM THE COMPARATIVE AND INTERNAL TECHNICAL ANALYSIS

The comparative analysis shows that

- **There are three main approaches to transition to date in existing asset-level alignment methodologies** (mostly in taxonomies):
 - ◆ **A transition whitelist approach** that distinguishes between efforts that have a positive impact on climate (and therefore that have, most of the time, no specific thresholds, such as solar energy generation) and those that offer benefits for climate mitigation purposes (for example, CCUS technologies for coal-fired power plants; restoration of gas pipelines to reduce methane leakage; use of recycled materials in manufacturing, clothing, and consumer goods; fuel shifting in shipping; and so forth). This approach mostly does not include progressively decarbonizing activities that focus more on enabling activities to support decarbonization in hard-to-abate sectors.
 - ◆ **The application of so-called remedial measures or remedial efforts to transition with a focus on innovation.** This approach might include a variety of measures to ensure the minimization of waste and GHG emissions with reductions in material and energy inputs, which can, in turn, efficiently act as a transition route for all sectors (for example, use of energy efficiency and renewable energy and improvements in business process engineering, operations management, waste management, and so forth).
 - ◆ **A dynamic pathway approach that moves from a significant harm to a significant contribution**—sometimes referred to as a “traffic light approach,” in which amber or transition activities move toward a low-carbon (“green”) pathway within a specified time frame (figure 29).

70 In the financial reporting space, challenges to disclosure of forward-looking information are important, as explained in PwC (2007). Challenges specific to sustainability-related forward-looking information have been drawn from a specific survey conducted by TCFD (2021), including concerns around reliance on assumptions required to derive future company-level emissions; lack of/poor quality of other data (non-GHG emissions); lack of comparable metric calculation methodologies; concerns around reliance on assumptions and future uncertainty; distrust in the reliability of outcomes; resource constraints; difficult-to-understand or opaque metric calculation methodologies; and metrics that are sometimes useful internally but not suitable for public disclosure.

Figure 29: Traffic-light approach in transition taxonomies



Source: Original figure for this publication.

Note: GHG = greenhouse gas; IPCC/IEA = Intergovernmental Panel on Climate Change/International Energy Agency.

Categories in this approach are threefold (figure 29):⁷¹

- **Red (significant harm).** These activities significantly hinder climate-related goals and should either (a) be abandoned (for example, energy generation from solid fossil fuels), with the decommissioning of all activities then qualifying as environmentally sustainable to facilitate finance for the decommissioning, or (b) transition to achieve substantial decarbonization (for example, cement or steel production), therefore having to improve to halt significant harm.
- **Amber (intermediate performance).** These activities significantly affect climate mitigation goals but do not significantly deter (nor substantially contribute to) climate or environmental sustainability objectives. Such activities may include (a) those that are not currently releasing zero (or near zero) emissions but that are following

71 See IMF (2022), chapter 2 and the online appendix, <https://www.imf.org/en/Publications/GFSR/Issues/2022/10/11/global-financial-stability-report-october-2022>.

a decarbonization pathway aligned with the trajectory required by the Paris Agreement; (b) those that face significant barriers to decarbonization—because low-emission alternatives are not yet available or economically viable and therefore lack a viable well-established technological pathway toward decarbonization—but are making all available short-term emission reductions while zero-emission alternatives are being developed (for example, zero-emission marine transport); and (c) interim solutions, embedding activities that generate fewer greenhouse gases compared with an alternative and that need to be carried out for a limited time while alternative low-carbon technologies are developed into viable and scalable solutions (for example, electricity generation from existing natural gas plants with carbon capture and storage technologies).

- **Green (such as low-carbon activities).** Such activities fulfill all environmental sustainability requirements as set out by a taxonomy, a decarbonization roadmap, a transition plan, and so forth. This category may include activities with a low climate and environmental impact—which do not have the potential to contribute substantially to, nor significantly harm, environmental sustainability.

Most of these approaches refer to a color-coding approach and to the concept of “improvement” for carbon-intensive activities (especially for those that are not currently zero or near-zero emissions or that face significant barriers to decarbonization). These approaches provide interim solutions to firms for a limited period (before the activities eventually become ineligible for any robust and science-based transition methodology—for example, natural gas power plants using CCUS technologies). Most of these approaches involve companies (both nonfinancial and financial) setting midterm targets, identifying pathways to meet climate objectives, and establishing implementation plans to meet the targets over a defined period.

Existing approaches lack some clarity regarding criteria setting and other technical considerations. For example,

- **Distinguishing between sectors is unclear** (especially for those asset-level alignment approaches adopting a holistic sectorial approach), as are activities and industrial processes and technologies when a set of different thresholds or pathways is applied.
- **Taking steps is needed to avoid supporting activities (for instance, via a managed phaseout strategy)⁷² that promote long-term carbon lock-in or activities that retain economic barriers to low-carbon solutions.⁷³** This approach has not been greatly advanced at this stage. In the absence of appropriate safeguards, transition finance may be particularly prone to carbon lock-in owing to investments that may be related to fossil fuels (such as retrofitting⁷⁴).
- **Most asset- and entity-level alignment approaches do not provide complete pathways.** Rather, thresholds are set for defined periods and then designed to ratchet down over time. This method leads to a series of comparability and interoperability challenges.

72 See GFANZ (2022b). For example, the Monetary Authority of Singapore launched on June 28, 2023, a public consultation on the detailed thresholds and criteria for financing the early phaseout of coal-fired power plants under the Singapore-Asia Taxonomy (MAS 2023). The document underlines “The challenge is to align the ambition of the 1.5°C objective **with an actionable strategy required to fast-track** the decommissioning and retirement of the [coal-fired power] plants that still have a long remaining operational lifetime and remain economically competitive, which could be due to lock-in of long-term contracts” (ABS 2023, emphasis in original). In this context, the document suggests that “the criteria for early coal phase out complement the Singapore-Asia Taxonomy’s **effort to develop a credible approach [to] what constitutes a transition finance**. While **the amber category defined for the Singapore-Asia Taxonomy focuses on the “transition within”** concept (activities that will be required beyond 2050 but will require extensive decarbonization to be aligned with net-zero), the **early coal phase out criteria aim to operationalise [the] ‘transition away’** approach (managing and fast-tracking the decline of emissions-intensive economic activities for which there is an alternative) (ABS 2023, emphases in original).

73 For a general definition of carbon lock-in, see Sato, Elliott, and Schumer 2021. According to Nacke, Cherp, and Jewell (2022), “lock-in is an overarching concept that encompasses several, more granular mechanisms, such as strategies of incumbent regimes including regime resistance, self-reproduction and incremental adjustment.” For more details on why existing sociotechnical systems are characterized by stability, inertia, and lock-in, see Berkhout, Smith, and Stirling (2004).. See also Elzen, Geels, and Green (2005).

74 Particularly if conversion, retrofitting, or both come at a relatively high cost. See ECA (2015).

- **Given the range of unknown factors at play, it is difficult to predict future threshold levels.** For example, the availability and viability of low-carbon alternatives, the pace of transition pathways for hard-to-abate sectors, and nonlinear transition trajectories at the entity level are difficult to foresee.
- **Ways to effectively cover economic, technological, or political barriers are not detailed at this stage for the vast majority of methodologies.** To a lesser extent, a somewhat high degree of dependency on external factors hinders decision-making as well.
- **Current asset-level approaches have followed a multitiered approach that would be the most efficient way forward, but the varied approach results in different starting points for entities undertaking a particular activity.** For instance, one approach would allow higher GHG emissions for a limited period while it incentivizes progression to lower emissions, but a mechanism would set less ambitious tiers with a clearly stipulated sunset date, after which higher emissions are no longer allowable. Such an option has been discussed in policy and academic literature;
- **Little attention has been given to transition considerations in existing alignment methodologies,** including those criteria related to managed phaseout of carbon-intensive activities, which usually entail complex employment-related and social challenges.

C. METHODOLOGICAL SUGGESTIONS TO APPLY THE PRINCIPLE

Design of the Sustainable Finance Alignment Methodology

When designing transition plans, detail options to effectively embed supply chain criteria and targets, given that Paris Agreement-aligned decarbonization entails transformative changes in energy and production systems (D’Arcangelo et al. 2022). More specifically, criteria for decarbonization may be focused on the most efficient abatement levers (most of them being readily available and affordable, depending on countries and industries),⁷⁵ including

- **Circularity.** In light of existing difficulties in assessing circularity,⁷⁶ regulatory regimes differ substantially among countries. It is a popular objective in existing asset- and entity-level approaches, but it remains not well defined at this stage.
- **Process and material efficiency (reducing power, waste, and heat consumption) or new (production) processes.** This option fits closely with a transition approach because GHG emissions thresholds are not difficult to assess and allow for efficient and cost-effective decarbonization (and cost-savings) in most industries. In addition, the option supports innovation (for example, process and heat technologies, process steering, and switching).⁷⁷

⁷⁵ See Rissman et al. (2020).

⁷⁶ As defined by Rissman et al. (2020), the term circularity refers to a circular economy, which contrasts with the concept of a “linear economy” (the predominant value chain structure today), in which goods are produced, consumed, and discarded. Circularity refers to the fact that every end-of-life product is considered a resource that can be put to valuable use. Rather than being a single type of activity (such as recycling), circularity refers to a cascade of options that put each product, component, or material to its highest or best use, minimizing value loss.

⁷⁷ See, for instance, Bataille et al. (2018).

- **Use of renewable power (self-generation, procurement) and heat or steam generation or fuel switching.** This option fits closely with current alignment methodologies, despite a life cycle approach to criteria setting and effective implementation that is not common in current tools, potentially limiting the application of this cost-effective lever.
- **Nature-based solutions (sustainable agriculture practices, reforestation, restoration of peatlands and mangroves, soil sequestration, and so on) and CCUS technologies.** These options can be costly, and significant advantages may differ among sectors and geographical areas.⁷⁸

Disclosures and Data

The following actions regarding disclosures and data are appropriate.

- **Underscore to stakeholders to what extent and how entity-level reporting is key to encompass the entire value chain,** especially if the firms are associated with sectoral pathways and the approach is based on a full GHG scope reporting criterion. Given that the lack of transparency and data is certainly the most common challenge, stemming from an often-unclear picture of most companies' end suppliers (tier suppliers, including suppliers and suppliers of suppliers), it is important that alignment methodologies deeply embed this concept.⁷⁹
- **Ensure that corporate climate transition plans provide environmental and financial credibility** so that they can have a measurable impact on the real economy and support climate alignment frameworks at the financial sector level (GFANZ 2022a).
- **Such credibility is crucial because in a carbon-constrained economy, transition plans enable companies to describe—and thus reach—their climate, environmental, and just transition-related commitments, goals, targets, and measures.** The transition plans need to include critical business (suppliers, capital expenditure spending) and decarbonization levers (ICMA 2023). Through the plan companies may demonstrate how to deliver change and demonstrate transition readiness. Because of the lack of one-size-fits-all approaches to transition plans (due to a variety of decarbonization levers, economic and industrial environments, and subsequent commercial trade-offs), the plans should also illustrate how the firms will maintain financial performance and competitiveness during their transition, in addition to being dynamic and forward looking. Thus, transition plans enable financial market participants to have a sufficiently robust basis on which to make informed investment decisions and to better manage their transition risks while harnessing transition opportunities.
- **Ensure that entity-level alignment approaches address transition considerations in a science-based manner.** Doing so involves the consideration of seven pillars, which result from a planning process at the entity level.⁸⁰ Figure 30 illustrates the pillars encircling the overall goal.

78 See van Zanten et al. (2023) and Girardin et al. (2021).

79 CDP recommends that value chain engagement and low-carbon solutions be integral elements of transition plans (CDP 2023, 9): "A climate transition plan should include time-bound actions to decarbonize business processes (and those of its value chain), with time-bound KPIs [key performance indicators]. This includes three distinct elements: (1) value chain engagement; (2) increasing share of revenue from low-carbon products and services; and (3) implementing emissions reduction initiatives for its direct and indirect operations."

80 This section partly builds on takeaways from OECD (2022a).

Figure 30: Seven pillars to address transition challenges at the entity level



Source: Original figure for this publication.

D. METHODOLOGICAL SUGGESTIONS AND CONNECTIONS WITH OTHER PRINCIPLES

Set Net-Zero and Paris Agreement Temperature Goal-Aligned Targets and Interim Targets

CONNECTION WITH PRINCIPLE 1 AND PRINCIPLE 5

Description

Targets need to be in line with the global temperature goals of the Paris Agreement, while plans need to specify how the entity aims to achieve those targets across emissions Scopes 1, 2, and 3. These targets clearly specify the underlying assumptions and methodologies and how they relate to the global temperature goals (IPSF 2022).⁸¹ Whenever feasible, the plan explains how a climate scenario analysis has been used to set targets (including underlying assumptions and limitations).

Key methodological issues

Setting these targets comes with a series of challenges (some of which have been addressed throughout this paper, notably in Principle 1), especially in the absence of full standardization in target setting.⁸²

- **The exact target dates for achieving net zero may vary by sector and jurisdiction** because achieving net zero globally by 2050 can involve different levels of effort by different sectors and industries, and commitments by national jurisdictions vary⁸³ (for instance, on scope and coverage of GHG emissions and sectors, time frame, and their status). Therefore, to account for this variety and allow for proportionality, companies may use an IPCC reference scenario consistent with limiting warming to below 2°C if they cannot, in their assessment, use 1.5°C as their benchmark.⁸⁴ However, for anti-greenwashing purposes and to allow investors to be able to evaluate the level of climate ambition, disclosures should include an explanation as to how the plan's targets compare to a science-based benchmark or the relevant NDC and national net-zero target (in this case, any discrepancy with a temperature goal should be acknowledged).

81 The International Platform on Sustainable Finance (IPSF) has developed target-setting principles in its 2022 Transition Finance Report (IPSF 2022), of use especially at the portfolio level.

82 See SBTi (2023) and UN (2022).

83 As described in this report, in Principles 1 and 5, and in Jeudy-Hugo, Lo Re, and Falduto (2021).

84 The lack of a national net-zero target, or the setting of a target with a later date (that is, after 2050), or the lack of sufficient enabling policies to incentivize company decarbonization may be factors that could prevent some of the companies operating in those jurisdictions from being able to comply with a 1.5°C trajectory.

As a matter of example, the European Commission specifies in its June 2023 recommendation on facilitating finance for the transition to a sustainable economy⁸⁵ that companies may consider their transition finance needs based on their sustainability impacts, risks, and opportunities, through a materiality assessment. The recommendation underlines: “As part of this assessment, undertakings could use climate- and environment related scenario analysis to inform the identification and assessment of physical and transition risks and opportunities over the short, medium- and long-term time horizons. Based on the outcome of such a materiality assessment, undertakings could set transition targets and determine transition finance needs and commitments, where relevant” (EC 2023b, 3). Such an assessment would therefore feed into a transition plan, which the European Commission describes as follows: “Transition plans are a useful tool to translate climate or environmental targets at the levels of both undertakings and economic activities into actions and an investment plan when communicating with financial intermediaries and investors. Financial intermediaries and investors might also take into account information from transition plans and the integrity, transparency and accountability of the targets included in the plans when assessing the transition and physical sustainability risks associated with an investment” (EC 2023a, 5).

- **A robust final target should be accompanied by interim (for example, 3–5 to 10 years), quantifiable, detailed and time-bound targets**, including an explanation of the methodologies and assumptions used to derive them. These intermediary targets should be considered milestones on the path to net zero, thereby emphasizing that investment decisions are not backloaded and would take place in an orderly and near-term way. As countries would underpin long-term goals with interim targets (usually with concrete implementation road maps to achieve stated ambitions, including interim milestones, implementing policy measures, and regular reporting and review mechanisms), companies can embed those elements in their plans.

Countries increasingly set interim milestones using carbon budgets, according to Jeudy-Hugo, Lo Re, and Falduto (2021). Compared with single-year interim targets, carbon budgets, they wrote, “offer flexibility in distributing yearly emission reductions over a set period. At the same time, given the flexibility they offer, carbon budgets may be difficult to enforce. This is because in the absence of quantified, single-year milestone target, there can be an incentive for policymakers to delay action and investments.” These concerns may therefore be addressed in designing transition plans at the entity level.

- **Therefore, the entity’s objectives and priorities for reducing GHG emissions should be integral to target setting.** If the entity excludes any relevant scopes or categories of GHG emissions from its targets, it should explain why and outline the steps taken to enable target setting for the scopes or categories considered relevant.

85 In its June 2023 recommendation, the European Commission specifies: “Sustainable finance tools, in particular the Taxonomy, or the EU climate benchmarks as well as credible transition plans can be used to support the definition of transition targets and articulate specific transition finance needs at the level of the undertaking and at the level of economic activities” (EC 2023b, 9). The annex further notes, “Transition finance can then be raised through green- or sustainability linked bonds, loans, equity financing or specialised lending” (EC 2023a, 6). The recommendation aims at clarifying the concept of transition finance, acknowledging the significant role that market participants can play by voluntarily using tools from the European Union sustainable finance framework, as needed, for transition finance. (Tools include EU climate benchmark decarbonization methodologies to set portfolio transition targets and identify relevant companies; EU Taxonomy criteria and disclosures to set portfolio-level targets and identify relevant undertakings; corporate disclosures under the Corporate Sustainability Reporting Directive to select undertakings with specific transition objectives and needs; disclosures and prospectuses accompanying the issuance of green-, transition-, and sustainability-linked bonds or equity.)

Connection with asset- and portfolio-level approaches

- **A target-setting exercise may be pursued, considering the level of ambition of criteria setting at the asset level.** If a transition plan incorporates transitional activities or technologies embedded into a transition taxonomy, it should make the connection between the feasibility of decarbonization of those activities or technologies in the near term (at interim dates that have been chosen) and how it may match with the final target set out in the plan.
- **Portfolio-level alignment methodologies commonly use one of three measurement approaches:** (a) binary target assessment (alignment of a portfolio with a given temperature outcome based on the percentage of investments with declared net-zero or Paris Agreement alignment targets); (b) benchmark divergence assessment, based on emission pathways describing the reduction needs to achieve a given warming target, derived from climate scenarios and comparing counterparty GHG emissions against them); and (c) implied temperature rise models, translating an alignment assessment with a benchmark into a measure of the consequences of the alignment in the form of a temperature score).

Companies with net-zero/Paris Agreement-aligned transition plans, including targets, would substantially ease the process of target assessment at the portfolio level, especially for those methodologies that can be applied to any asset type. It is also important that the portfolio alignment approach allows for the evaluation of progress based on (or weighted by) real-world emissions, ensuring that activities requiring capital flow are well identified. Portfolio alignment tools, therefore, play an important role in the target-setting process, setting expectations on portfolio alignment in the intermediate term with a unique economic composition perspective and providing input for engagement and management decisions to achieve those targets.

GHG emissions, targets, and production-related plans are fundamental elements in assessing the forward trajectory of companies in a portfolio alignment approach. Although they are improving, voluntary disclosure and target-setting exercises still fall short of data needs, especially on Scope 3 GHG emissions,⁸⁶ targets, and forward-looking decarbonization plans. Such an approach in transition planning would, therefore, greatly contribute to filling this data gap.

⁸⁶ As emphasized by GFANZ (2022a), Scope 3 emissions “should be included at minimum for high-emitting sectors, such as the priority sectors identified in the Net Zero Asset Owners Alliance target-setting protocol [UN 2023], which include Oil and gas; Utilities (including coal); Transport (civil aviation, shipping, and road transport); Materials (steel, cement, and aluminum); Agriculture, forestry, and fisheries; Chemicals; Construction and buildings; Water utilities; and Textiles and leather.”

Grounding in a transition taxonomy, sectoral pathways, or technology road maps

CONNECTION WITH PRINCIPLE 1 AND PRINCIPLE 5

Description

Transition plans should explain how the plan's targets compare with relevant national-level frameworks, such as sector-specific transition pathways and road maps, where these are available. The plans should clarify how and for which technologies future operating and capital expenditures (including research, development, and innovation) will be used to achieve targets. Transition plans should also specify the mechanisms to be put in place to prevent carbon lock-in if proposed investments in the plan present such a risk (particularly investments relating to fossil fuel assets and infrastructure).

Key methodological issues

A credible corporate transition plan needs to include the following actions:

- **Ensure that the plan's targets compare to relevant sector-specific transition pathways, transition taxonomies, and road maps.** Ensuring the targets enables financial market participants to place the company's activities within the relevant national or regional policy context. Any discrepancy between those transition frameworks (sectoral transition pathways and taxonomies, or road maps) and the plan's target should be disclosed and explained.
- **Clarify how and for which technologies future operating and capital expenditures (including research, development and innovation expenditures) will be used to achieve targets.** This identification process must be grounded in science-based transition taxonomies, related sectoral pathways, and road maps.

These elements have been underlined by the International Capital Markets Association in its "Climate Transition Finance Handbook" (ICMA 2023): "Climate transition focuses principally on the credibility of an issuer's GHG emissions reduction strategy, commitments, and practices" (3). ... Recommended information and indicators [include] a long-term, science-based target to align with the goals of the Paris Agreement; relevant and credible interim science-based targets in the short and medium-term on the trajectory towards the long-term goal, in line with the relevant regional, sector, or international climate change scenarios; disclosure on an issuer's transition plan or climate transition strategy. This should include specific itemisation of the main levers towards GHG emissions reduction, such as a detailed capital expenditure (CapEx) plan and relevant technological implications (i.e., amounts to be spent, what carbon cost is considered for implementing such CapEx programme, operational impacts, regulatory considerations, etc.)" (5).

Organize the plan around three main buckets (in line with elements provided in Principle 1).⁸⁷ These are

- **Low-carbon solutions**—activities, technologies, and processes that attempt to provide a direct decarbonization outcome (or that enable the provision of a direct decarbonization outcome⁸⁸) as a substitute for carbon-intensive technologies or services;

⁸⁷ GFANZ (2022a) guidance on transition plans goes in the same direction.

⁸⁸ As such, they may be complemented by enabling conditions—that is, "conditions that enhance the feasibility of [...] mitigation options" (IPCC 2022, 44n72). In this context, they can include technological innovation, data availability, relevant policy instruments (including of fiscal nature), institutional capacity, and the applicable regulatory framework (IPCC 2022).

- **Alignment with net zero (or other climate-related goals)**—activities and technologies that signal transition alignment behavior as being transitional and supporting the implementation of changes to deliver climate-related targets;
- **Managed phaseout**—activities for which underlying carbon-intensive physical assets need to be phased out (for example, early retirement of assets on a time frame consistent with the broader net-zero trajectory).

Provide clarity on the mechanisms to be put in place to prevent carbon lock-in where proposed investments would present such a risk (for example, fossil fuel assets and infrastructure). A methodology to avoid carbon lock-in in transitional processes should be formalized and standardized across major carbon-intensive activities, especially for coal, natural gas, and oil (Erickson, Lazarus, and Tempest 2015; Kempfert et al. 2022). Figure 31 attempts to provide an example of a general framework that may be applied and downscaled at the entity level in transition planning. With robust interim and long-term decarbonization targets and transition taxonomy criteria, the framework offers a valuable tool to prevent lock-in.

Figure 31: Framework for progressive sectoral transformation



Source: Original figure for this publication.
 Note: GHG = greenhouse gas.

Connection with asset- and portfolio-level approaches

- **Asset-level methodologies such as transition taxonomies provide clarity on the types of activities and technologies that allow for the greatest GHG emissions reduction**, as in the example of the three-bucket approach. Along similar lines, the color-coding approach to transition taxonomies enables companies to integrate greater dynamism into their plan.
- **Portfolio-level alignment methodologies build on scenarios that must be updated to reflect technological progress, emissions performance, and policies.** As underlined by the TCFD Portfolio Alignment Task Force (TCFD PAT 2021, 68), “transition scenarios, and ultimately the feasibility of decarbonization across sectors, is highly sensitive to the cost of decarbonization technologies. In recent years, these costs have evolved rapidly and in sometimes unexpected ways. Scenarios will need to model out the most up-to-date, full range of costs and expected cost declines for critical decarbonization technologies (perhaps biannually). As new breakthroughs occur, scenarios should reflect information that may shift the sectoral pathways that are most feasible for reaching net-zero.” Therefore, plans must reflect those evolutions in technological progress alongside transition taxonomies.

Grounded in reliable and quantifiable metrics and targets

CONNECTION WITH PRINCIPLE 1

Description

Credible climate change mitigation-related metrics and KPIs used in transition plans are expected to cover lifecycle GHG emissions, both in absolute terms and intensity based, and should extend to subsidiary companies. Transition plans should detail the key performance indicators (KPIs) the company will use to measure its performance and progress and should provide the definition of the KPIs, the applicable scope, and the measurement methodology. Credible KPIs are relevant and material to the company’s selected goals and targets, measurable, externally verifiable, and able to be benchmarked. Climate metrics and KPIs should be based on the same corporate boundary as those used for financial metrics and KPIs (as published by a given company).

Key methodological issues

While setting targets (including interim targets) and relevant KPIs, several challenges may arise and should be cautiously addressed in the design of an alignment methodology at the entity level:

- **Transition plans should directly reference the company’s financial plan and should be completed concurrently with financial reporting**—by being integrated into the overall business plan. Doing so can explicitly address any needs and commitments for capital expenditure, operating expenditure, merger and acquisition activities, and research and development expenditures necessary for the delivery of the transition plan and related targets. Thus capital stock, working capital, and overall business streams are aligned with the company’s transition targets and KPIs.
- **Transition plans should detail the KPIs used to measure performance and progress and define the KPIs, the applicable scope, and the measurement methodology.** For example, the Assessing Low Carbon Transition methodology jointly developed by CDP and ADEME (the French Environment and Energy Management Agency) provides a useful framework.

- **For some companies, capital allocation plans that support repositioning the capital stock will be critical.** For others, operating expenditure may be more significant, including costs of retraining and redeploying staff or decommissioning stranded assets, or staff costs to operationalize low-carbon production practices.
- **Any mention of “significant,” “relevant,” and “material” should be substantiated by specific information,** especially regarding the reporting of Scope 3 GHG emissions and in order not to undermine the credibility of transition plans.
- **A credible transition plan would not consider carbon credit and carbon offsets solely as an alternative to cutting a company’s emissions today or as a reason for delayed mitigation action but rather as a last resort component of the portfolio of solutions to accelerate the pathway to net zero.** Plans that do consider the use of offsets should explicitly describe any intended use of carbon credits and offsets, the basis for their carbon removal (such as whether it is nature or technology based), the applicable verification or certification program, and the quality criteria to be used to assess the credibility of offsets. Such plans will consider not including offsets in the GHG inventory and as a contribution to the GHG targets. The plans will explain the additionality and permanence of the offsets and the extent to which they are being used as a last resort.⁸⁹

Connection with asset- and portfolio-level approaches

Asset-level methodologies may provide the relevant criteria for decarbonization, with supporting metrics and data needs, and therefore support setting specific targets (including interim targets) and KPIs as part of transition plans.

- **Asset-level methodologies may provide the relevant criteria for decarbonization,** with supporting metrics and data needs, and therefore supporting specific targets (including interim targets) and KPIs as part of transition plans.
- **Portfolio-level alignment methodologies—in the context of determining how warming metrics allocate the responsibility of emissions reductions to companies (TCFD PAT 2021)—may benefit from transition-related metrics in hard-to-abate sectors** (that is, the use of granular scenarios) and those that include transition plans (as part of the setting of GHG emissions targets). As such, the methodologies would facilitate the identification of capital allocation needs. Other types of metrics illustrate the necessary judgments made in portfolio-alignment methodologies. For example, TCFD PAT (2021, 7) notes that the “choice of whether to assess total company emissions or emissions per unit of output could determine whether providers of capital would prioritize transforming companies by rewarding growth in market share (such as expansion in renewables) or absolute emission reductions (such as reduction in fossil fuels). It is therefore important that investors and lenders, as well as methodology developers, understand the implications of these and other key judgements.” The same could be said about the inclusion of Scope 3 GHG emissions.

⁸⁹ The Voluntary Carbon Markets Integrity Initiative published guidelines in 2023 to inform companies on how to make credible climate claims (a so-called Claims Code of Practice), including the publication of annual GHG emissions, the adoption of science-based targets, and the consistency of advocacy measures with the Paris Agreement goals (VCMi 2023). See also Roston (2023).

Set an implementation strategy

CONNECTION WITH PRINCIPLE 1

Description

Transition plans should set a clear strategy for the company's path to achieving its targets. The strategy should articulate the transition risks and opportunities the company expects to face in the short, medium, and long term, as well as any foreseen limitations, constraints, and uncertainties.

Key methodological issues

In connection with the description of target setting and the identification of sectoral priorities, it is as important that the plan sets out the measures in place to reach the targets. These measures should include

- **The description of the strategy the company intends to roll out to achieve targets** (including the final and interim targets) by articulating transition risks and opportunities that the company expects to face in the short, medium, and long term;
- **The financial metrics and targets used to assess progress toward the final target and the broader entity's strategic ambition;**
- **The concrete actions to be taken to achieve the defined targets and the capital investments needed**, using relevant tools such as transition taxonomies and roadmaps (as previously discussed);
- **The most important implications of the transition plan for the entity's business model** (such as products and services, acquisitions or divestments, operational and capital expenditure) and its material interdependencies (such as natural environment, a broad range of stakeholders, and so forth), including its engagement with downstream and upstream entities in the entity's value chain and with peers in the entity's industry;
- **The reliance on multiple climate-related scenarios, whenever feasible, to better understand how transition risks and opportunities might develop and to better assess how the business model may be affected over time**, ultimately supporting the company's strategic decision-making under uncertainty. In this context, a credible transition plan will also identify levers and corrective actions that could be taken to address or correct underperformance against a target; and
- **Any strategy to manage the phaseout of most carbon-intensive assets**, distinguishing between new, existing, and retiring assets in the fossil fuel sector and describing potential asset retirement obligations and the process for the responsible retirement for those assets, including how just transition considerations are incorporated (see the connection with Principle 1 on the just transition strategy).

Connection with asset- and portfolio-level approaches

- **Asset-level methodologies would be particularly relevant for identifying the most carbon-intensive assets and those that should be phased out.**
- **Portfolio-level methodologies need to combine backward- and forward-looking data.** In this context, it is key that a quantitative and qualitative assessment be made on the targets (for example, duration credibility, validation, progress, and so forth) and also on any transition plan or strategy the counterparty has designed based on available technology and policy levers, as well as the related level of management awareness and short-term capital expenditure plans. According to the Portfolio Alignment Team (TCFD PAT 2021, 48), these should “be seen as a primary or the most credible source” in the design of a portfolio alignment method.

Ensure the integration of governance, transparency, and accountability mechanisms

CONNECTION WITH PRINCIPLE 1

Description

Transition plans should clearly define a process and responsibilities for regular monitoring and reporting progress toward targets, as well as for any timely and regular revision and update of this plan (for example, on an annual basis). Revision should take stock of lessons learned, revisit assumptions, and identify levers for action, especially in areas that may be falling behind. The plan should be subject to board and senior management approval and oversight. Credible transition plans will also undertake third-party verification of the plan and related targets. Some companies may also be able to achieve certification, such as through SBTi or future programs, which would increase credibility.

Key methodological issues

With guidance included in Principle 3 and Principle 4, transition plans must allow for the following:

- **A sound general governance process** because transition planning should involve all relevant internal and external stakeholders, complemented by a process for regular internal and external monitoring and reporting of progress toward targets (including interim targets).

The board should be able to review the transition plan and ensure the oversight of monitoring and progress on disclosures. This governance process should be supported by disclosures. The disclosures might include processes for the board’s approval; incorporation into the terms of reference and other board-related policies; a review process by the board on interim and ultimate targets; allocation of responsibilities between the board and senior management; a monitoring process and progress disclosures (with KPIs that allow for tracking); accountability mechanisms and careful consideration by the board on the integration of the transition plan into the wider strategy, financial decision-making, and risk management.

- **In particular, there must be sufficient disclosures around the factors driving the entity’s performance toward achieving these targets**, including alignment of capital expenditure with the strategy, potential revised business operations, and other key actions (such as decommissioning of assets). Given the sensitivity of these elements, it is key that the governance of these transition plans be as robust and transparent as possible.

The process should ensure that underlying assumptions in designing and implementing the transition plan are disclosed, especially those related to (a) the evolving connection between the transition plan and the company’s financial statements; (b) technological developments; and (c) shifts related to policy, regulations, consumer preferences, and the physical consequences of climate change. Interim and final targets should be complemented by sufficient transparency on the elasticity of the target to these developments. The targets may be recalibrated depending on changing operating conditions to ensure continuous improvement.

Third-party verification of the plan and related targets is also recommended as part of OECD (2022b) policy guidance. The OECD recommends effective monitoring, including through third-party verification of data and targets used in transition plans. Standards for verification and appropriate verification providers will depend on the corporate’s jurisdiction and the transition plan’s contents. Although there is currently no international framework for accreditation of verifiers for corporate transition plans, some existing initiatives set out verifiers or verification standards that these initiatives recommend or require for compliance with their standards or certifications. Such standards can provide some guidance to users and preparers of transition plans on the appropriateness of different verifiers. In addition, policy makers are encouraged to collaborate with stakeholders and experts to improve existing verification and monitoring frameworks offered by third parties. Some companies may also be able to achieve certification, such as through SBTi or future programs under development, such as through the Climate Bonds Initiative.

Connection with asset- and portfolio-level approaches

- **A robust integration of governance, transparency, and accountability mechanisms into the design of asset-level alignment methodologies (primarily taxonomies) is a key principle**—all the more because it ensures consistency across levels of alignment.

CONNECTION WITH PRINCIPLE 2

Description

The credibility of transition plans can be increased by having the company articulate how it intends to apply the Principle of “do no harm” and thereby avoid harm to sustainability objectives, other than climate mitigation, both at an activity and entity level. In addition, the tiered framework set out in Principle 2—which includes minimum safeguards with the application of international, regional, and national conventions; application of a risk management approach (IFC Performance Standards, OECD’s Responsible Business Conduct framework); and a set of environmental and social topics—can help entities address harm on the full range of sustainability risks and impacts, include the consideration of social objectives.

Key methodological issues

Challenges related to identifying adverse impacts and data availability arise at both the activity and entity level.

In this context, it is key for companies to

- **Articulate how they intend to apply Principle 2 and thereby avoid harm to sustainability objectives other than climate change mitigation, both at the activity and entity level.** Should there be any unavoidable trade-offs or negative effects on one or more sustainability objectives due to the company's operations, these could be clearly documented.
- **Identify the operational challenges, primarily from a data and an interoperability perspective,** that arise to (a) identify and mitigate adverse impacts at the entity rather than the activity level, (b) apply this process for activities located in EMDEs, and (c) circumvent data availability and reliability challenges in certain sectors or business areas.

Connection with asset- and portfolio-level approaches

- **Integrating criteria similar to “do no significant harm” in asset-level alignment approaches would ease the identification and data collection process for those companies integrating adverse impacts into their transition plans at the entity level.** The learning curve at both levels (asset and entity) for identifying and mitigating adverse impacts is such that connections should be made as often as possible across these methodologies.

Box 6 addresses incorporating nature with the climate change targets in transition planning.

Box 6: Incorporate nature and biodiversity into transition planning

Climate change and nature loss are deeply intertwined (NGFS 2022) and need to be tackled as such together. While climate change is one of the drivers of nature loss (such as changes in the water cycle, alteration of soil temperature, and acceleration of habitat and wildlife loss), the loss of nature (including biodiversity) can form, in turn, a risk channel through which the effects of climate change on economic and financial activity may manifest themselves. Mitigating climate change can help preserve and conserve nature, although trade-offs between net-zero goals and nature protection may exist. Ecosystem services are critical in supporting adaptation and resilience to climate change while building a net-zero emission economy involves avoiding threats to these ecosystems.

In this context, policy makers and nonfinancial companies should progressively pay greater attention to the role of nature and biodiversity in transition planning. While alignment methodologies have, so far, adopted a climate-oriented approach, reaching climate-related goals requires a holistic approach by incorporating nature. Transition plans should therefore aim at supporting both the delivery of the 2015 Paris Agreement and the landmark agreement, the 2022 Kunming-Montreal Global Biodiversity Framework. For example, CDP defines “transitioning” as taking actions that align a business model with a world in which two key outcomes are pursued: not overshooting the Paris Agreement temperature goals and restoring natural ecosystem health.

In line with the recommendations made by the WWF in a 2023 report, and along the lines of the pillars set out for climate-related purposes, corporate entities should consider

■ **Setting targets to preserve nature and biodiversity while achieving climate-related goals.** Temperature goals can be met only by carefully considering the GHG emissions arising from nature’s degradation.

As such, the ultimate goals for alignment methodologies would be to prevent damage to ecosystems from low-carbon and transition activities (applying Principle 2 and addressing adverse impacts) and to identify nature-based solutions to restore natural carbon sinks (applying Principles 1 and 5). Given the numerous targets for biodiversity conservation and restoration in the abovementioned agreement, it has become fundamental that entities identify and mitigate adverse impacts on nature and biodiversity, fully grasp their impact, and align their activities and assets with global commitments.

In this context, the Nature-related Risk and Opportunity Management and Disclosure Framework by the Task Force on Nature-related Disclosures (TNFD) provides a set of core disclosure metrics (global and sector-specific), enabling corporate entities to demonstrate their alignment with global policy goals such as the Global Biodiversity Framework, and to pursue transition planning aligned with these goals and targets (TNFD 2023).^a

■ **Applying emerging methodologies for target setting that may be applied at asset, entity, and portfolio level.** For example, the SBTi-FLAG (Forestry, Land Use, Agriculture) methodology (SBTi 2022) applies to companies in land-intensive sectors to set science-based targets, including land-based emission reductions and removals. A diverse range of tools may help to address deforestation-related risks (for example, the ENCORE tool^b) and identify investment needs for biodiversity protection (for example, restoration of natural carbon sinks). The SBTN Materiality Tool^c helps to embed nature-related targets into business models and design an implementation roadmap that may be integrated into transition planning.

■ **Guaranteeing a sound and robust governance process** around integrating nature into transition planning, with relevant metrics and procedures to monitor and disclose progress against interim and final targets.

■ **Addressing climate change adaptation and resilience through complementary targets** and emphasizing mitigation co-benefits (Cook-Patton et al. 2021).

a. The TNFD specifies that it will consider the need for TNFD guidance on transition plans, both for nature within net-zero transition plans and transition plans to achieve nature-positive goals and targets.

b. Encore, “Hotspots” dataset, <https://encore.naturalcapital.finance/en/map?view=hotspots>.

c. SBTN (Science Based Targets Network), Sectoral Materiality Tool, https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fsciencebasedtargetsnetwork.org%2Fwp-content%2Fuploads%2F2022%2F02%2FSectoral-Materiality-Tool_UNEP-WCMC_January-2022.xlsx&wdOrigin=BROWSELINK.

Address just transition challenges

CONNECTION WITH PRINCIPLE 1 AND PRINCIPLE 2

Description

Transition plans should be designed and implemented to address the challenges posed by the company’s implementation strategy on workers and local communities (ILO 2022). These should be based on social dialogue (with trade unions and in stakeholder engagement processes) and measure progress on various social impacts of the transition—which are increasingly becoming crucial from a transparency and accountability perspective by financial institutions and a broader range of stakeholders.

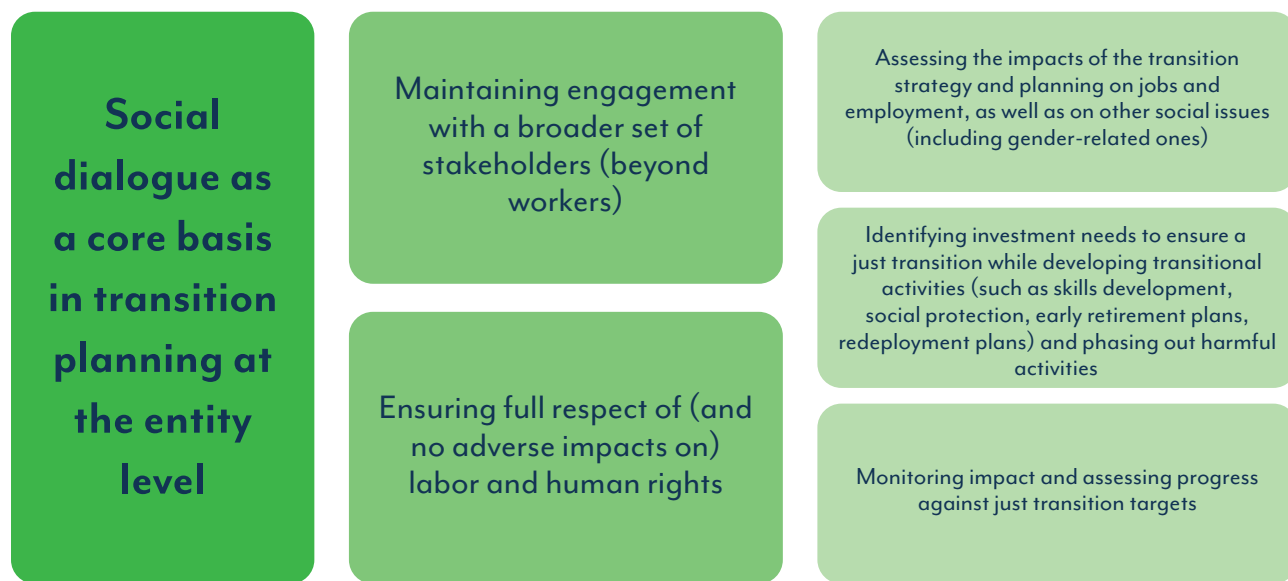
Key methodological issues

Addressing just transition issues remains at the early stages within transition planning strategies. In this context, particular attention should be paid to

- The identification and prioritization of potential adverse impacts on workers and communities, drawing on the OECD Due Diligence Guidance on Responsible Business Conduct (connection with Principle 2);
- The governance process that ensures regular and continuous stakeholder engagement and social dialogue (connection with Principle 4);
- The incorporation of human resources strategies to ensure decent work, adequate capacity and skills, and a plan for retaining, retraining, reskilling, and education opportunities.⁹⁰

Tracking progress on just transition can be grounded in a variety of elements, as shown in figure 32.

Figure 32: Framework for progressive sectoral transformation



Source: Original figure for this publication.

90 It may be worth building on the World Benchmarking Alliance lessons learned on how companies can commit to reskilling workers or risk a stranded workforce (2021)

Connection with asset- and portfolio-level approaches

- **The design of asset-level alignment methodologies, including transition taxonomies and their connection with sectoral decarbonization pathways, should fully incorporate a relevant mapping of the sectoral transformation** in terms of impacts for companies' business models and workers, as well as skilling and reskilling needs, and gaps in terms of labor standards (ILO 2022). Ensuring that a just transition from the company's lens is fully embedded into the design and implementation of these alignment methodologies would contribute to more robust transition plans at the entity level. It would be key in expanding low-carbon activities, financing transitional activities, and managing the phaseout of carbon-intensive ones.
- **Transition planning should account for the particular circumstances of MSMEs and certain companies in EMDEs.** Although the recommendations in principle apply to all companies and jurisdictions, the special challenges of MSMEs and certain EMDEs need to be accounted for because corporate transition strategies and plans need to be in line with the global temperature goals of the Paris Agreement and, as a result, carbon-intensive lock-in must be avoided. The MSMEs and companies in EMDEs have fewer resources available to comply with demanding disclosure requirements. Consequently, their focus can be on aligning their operations to keep their position in global supply chains or structure their operations to benefit from, for example, domestic preferential financing opportunities in support of a transition. In addition, MSMEs play a key role in the deployment of low-carbon innovation and employment and in promoting social cohesion: as such, transition plans would be useful for SMEs in their relationships with banks in trying to obtain suitable finance that supports the transition, and “the just transition [would] be a core part of new product development as they increasingly make up the bank's core product portfolio, for all client groups” (Curran et al. 2022).
- **Also of note, transition plans for financial companies may substantially differ from those of nonfinancial companies.** Financial entities have played a significant role in financing GHG emissions in their lending, underwriting, and investing activities. Moreover, there are additional considerations regarding their role in financial stability, the assessment of physical and transition risks, and their reliance on the nonfinancial company data of their clients and investees to inform their plans. In this context, the purpose of transition plans for financial institutions is evolving, with a combination of voluntary market-led transition plan principles (GFANZ 2022c), mandatory approaches targeting large entities in general (EU, the UK's Transition Plan Task Force), and—as advanced in academia, through the prudential perspective—mandatory plans to support supervisors' assessment of banks' misalignment with net zero, leading to short- and medium-term risks (Dikau et al. 2022). Ongoing discussions in the Basel Committee, the Financial Stability Board, and the Network for Greening the Financial System (NGFS 2023) may have significant consequences on the characteristics of these plans and their connections to those of nonfinancial entities.

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APPENDIX

A

Considerations to Better Integrate Supply Chain–Related Challenges in Climate Alignment Approaches

A selection of policy discussions on sustainable finance that encompass supply chain issues

- The International Labour Organization (ILO) “Guidelines for a Just Transition,” published in 2015,⁹¹ recognizes that to “create decent work opportunities by mobilizing and directing public and private investment towards environmentally sustainable activities” (ILO 2015, 6) requires a country-specific mix of macroeconomic, industrial, sectoral, and labor policies. The guidelines emphasize that “the aim should be to generate decent jobs all along the supply chain, in dynamic, high value added sectors which stimulate the upgrading of jobs and skills as well as job creation and improved productivity in more labour-intensive industries that offer employment opportunities on a wide scale” (ILO 2015, 6).
- On December 16, 2021, the G-7 launched the Sustainable Supply Chains Initiative,⁹¹ bringing together global food and agriculture companies that have pledged to improve the environmental, social, and nutritional impact of their operations and supply chains globally. Their performance is measured against the World Benchmarking Alliance’s Food and Agriculture Benchmark.⁹² In 2016, the Organisation for Economic Co-operation and Development (OECD) published guidance to support companies in observing standards of responsible business conduct to undertake due

91 See Organisation for Economic Co-operation and Development, <https://mneguidelines.oecd.org/g7-sustainable-supply-chains-initiative.htm>.

92 See World Benchmarking Alliance, <https://www.worldbenchmarkingalliance.org/food-and-agriculture-benchmark/>.

diligence along agricultural supply chains, including a framework for risk-based due diligence, and guidance for engaging with indigenous peoples.⁹³ The OECD “Guidelines for Multinational Enterprises on Responsible Business Conduct.” (referred to in Principle 2) encourage companies to incorporate social, human rights, and environmental considerations into the way they do business, anywhere in the world.⁹⁴

- Recommendation 21 of the 2022 G-20 Sustainable Finance Working Group (SFWG) report underlines the need to “Support SMEs [small and medium enterprises] and local FIs [financial institutions] to develop their awareness and capacity in addressing climate change to reduce their impact. SMEs often have more limited information and capacity to tackle climate change. Larger local FIs’ connection with wide-ranging SMEs could be an important channel to overcome this issue, as they could provide valuable advice based on rich information on SMEs’ business strategies and challenges they face. This should include work to support local banks ... to develop and implement sustainable finance strategies and credible net-zero transition plans. This channel is particularly important for jurisdictions with a bank-centric financial system, including **developing countries, where greening supply chains can have a significant impact in achieving the country’s climate change commitments**” (G-20 SFWG 2022, 21–22, emphasis added).

In its 2022 report, the G-20 SFWG points to the pressing need to address the greening challenges of supply chains given (a) the need for credibility of net-zero commitments (“the lack of capacity to collect and verify emissions data or climate adaptation needs [...] makes it difficult for some FIs to track and report the emissions of their clients, especially if including those of their supply chains”) (41) and (b) the growing role of financial and other digital technologies to implement so-called sustainable supply chain financing. The former can “enhance the access to sustainable finance to SMEs and reduce their funding costs” (61). Further, “Sustainable supply chain finance (SSCF) integrates ESG [environmental, social, and governance] considerations into regular supply chain finance, using consistent methodologies and data to rank a supplier’s sustainability performance and then providing preferential financing for suppliers with good sustainability performance” (62).

- The ISSB Standard on climate-related disclosures (ISSB 2023) includes issues related to supply chains in the context of strategy and decision-making. The entity shall disclose information about “current and anticipated changes to the entity’s business model, including its resource allocation, to address climate-related risks and opportunities (for example, these changes could include plans to manage or decommission carbon-, energy- or water-intensive operations; resource allocations resulting from demand or supply-chain changes; resource allocations arising from business development through capital expenditure or additional expenditure on research and development; and acquisitions or divestments)” (8). Scope 3 GHG emissions are also included in disclosure requirements, referred to as indirect greenhouse gas emissions that occur in the value chain of an entity, including both upstream and downstream emissions.

93 See OECD, https://www.oecd-ilibrary.org/agriculture-and-food/oecd-fao-guidance-for-responsible-agricultural-supply-chains_9789264251052-en.

94 See OECD, “Towards Ethical Supply Chains,” <https://www.oecd.org/about/impact/towards-ethical-supply-chains.htm>.

Why is it crucial to incorporate supply chains into climate alignment approaches?

There are five major reasons it is key to operationalize the alignment concept into supply chains, in the context of this paper:

- 1. Greenhouse gas (GHG) emissions in supply chains often exceed GHG emissions in direct operations (Scope 1) and power supply (Scope 2).** According to CDP, “A company’s supply chain is responsible for substantial environmental impacts. Last year, CDP found that GHG emissions in a company’s supply chain are, on average, 11.4 times higher than its operational emissions” (CDP 2022a, 3). The environmental impact also goes beyond GHG emissions, with impacts on nature and ecosystems (such as on water stress and pollution) often underestimated (CDP 2023). Tackling GHG emissions (and other environmental impacts) in supply chains therefore relates to the credibility of net-zero corporate commitments, as previously mentioned.
- 2. Supply chains may be considered as strategic investments in funding climate change mitigation (and, to an extent, adaptation) in climate-vulnerable countries.**⁹⁵ In addition, such an approach may prove even more important considering that in emerging markets and developing economies (EMDEs), sectors to be prioritized from a climate perspective often prove to be high-risk sectors from a social and human rights perspective (including agriculture, textile, mining, infrastructure, and automotive manufacturing) (Schneeweiß 2020).
- 3. In a similar vein, incorporating supply chains may accelerate climate-related action in hard-to-abate sectors** (such as steel, cement, chemicals, and heavy transportation) for which decarbonization efforts are difficult to finance. This difficulty is primarily due to the economic dimension of path dependency, with a series of barriers to innovation: low profit/GHG emissions ratio, high capital intensity, large scale of process industries, irregular financing profile of core process technologies, long investment cycles, and low and cyclical profit margins. (Wesseling et al. 2017). The fact that these technologies are often at an early stage of development adds to the challenge (IEA 2020).
- 4. It may bring favorable impacts in regions and countries where regulatory pressure, support for climate change mitigation, or both are lower, thereby contributing to improve SMEs’ GHG emission profile, especially in EMDEs.**
- 5. It may contribute to accelerating the efficiency of advanced economies’ alignment systems** (especially taxonomies and transition planning frameworks, supported by their relevant disclosures). This is all the more important for companies and financial institutions with supply and investment chains in EMDEs, thus potentially ultimately mitigating supply chain price shocks.

⁹⁵ See Woetzel et al. (2020) on the materiality of climate physical risks in supply chains.

What are the challenges at stake?

Yet, the benchmarking analysis performed for this paper has shown that few alignment approaches duly considered supply chain–related issues, in addition to disclosure requirements or standards integrating Scope 3 GHG emissions (as discussed previously). The European Union Taxonomy (via Scope 3 analysis) and the Association of Southeast Asian Nations (ASEAN) Taxonomy project (by requiring an assessment of the agriculture and land use sector through the “Plus Standard Framework” to account for the complexity of these activities and the need for “detailed assessment of the supply chain to ensure alignment with the objectives of the Taxonomy”) do incorporate, at least indirectly, the challenges of supply chains. However, this issue remains broadly overlooked in most alignment approaches.

In addition, the World Economic Forum has assessed the factors that have prevented companies from incorporating climate change mitigation goals into their supply chains (WEF 2021). These involve

- Transparency and knowledge gaps among suppliers and on Scope 3 boundaries, reinforced by Scope 3 estimations’ reliance on averages; fragmentation in decarbonization pathways and target-setting across regions, sectors, and companies; conflicting legislations across jurisdictions; and underdeveloped firm-level assessments of “minimum safeguards.”
- Practical challenges in monitoring fragmented suppliers (in the context of an often-unclear picture of most companies’ end suppliers (Tier n suppliers, including suppliers and suppliers of suppliers).
- Cost-related challenges due to misalignment of procurement incentives with climate change objectives and high costs in individual supply chains.

This paper’s contribution: Incorporating the supply chains issue into climate alignment approaches may take a variety of (complementary) forms

The specific economic, financial, and industrial structures and SMEs of most EMDEs should not be left out of the sustainable finance picture. This paper contributes to the advancement of this issue by suggesting a series of often complementary solutions:

Principle 1: Scope 3 GHG emissions, sectoral coverage, and just transition considerations

■ Inclusion of Scope 3 GHG emissions in disclosures and design of alignment approaches

GHG Scope 3 coverage should be considered a prerequisite in the criteria for alignment approaches and in the life cycle analysis approach to products and services (as laid out by the GHG Protocol methodology⁹⁶). Alignment approaches that encompass all scopes of GHG emissions require companies to develop a full GHG emissions inventory—incorporating corporate-level Scope 1, Scope 2, and Scope 3 emissions. Such an inventory allows entities to understand their full value-chain GHG emissions and to focus their efforts on the greatest GHG reduction opportunities.

The critical role of life cycle analysis in supply chains is explained in Meinrenken et al. 2020: “a sector-level understanding of emissions, absent of individual PCFs [product carbon footprints], is insufficient to reliably quantify carbon emissions, and that higher reported emission reductions go hand in hand with more granular PCFs.” Meinrenken and coauthors’ methodology is a useful tool because it maps the variety of life cycle stages to three consistent value chain portions—upstream, direct company operations, and downstream—so that origins of GHG emissions in the value chain (so-called hotspots) can be compared across products and sectors.

■ Inclusion of sectoral coverage as a fundamental parameter in integrating supply chains into alignment approaches

Less than 10 sectoral supply chains account for more than 50 percent of GHG emissions (including food, construction, automotive production, and freight) (WEF 2021). Key supply chains have intermediate steps in EMDEs, where significant GHG emissions are released. Raw material inputs and intermediary industries should therefore be key areas of attention, especially for EMDEs, when considering sectoral coverage in alignment approaches:

- ◆ The literature recognizes the need for inclusion of emissions related to raw material inputs and intermediate processing steps, but alignment approaches do not adequately account for these steps in supply chains.⁹⁷ Yet, these supply chains face various transition challenges at different stages (such as battery manufacturing in transportation), a fact which points to the key role of raw material inputs (such as cement and wood in construction and buildings, metals in automotive production) which drive the vast majority of GHG emissions.
- ◆ Intermediary industries (such as electronics and the textile industry) also need to be included considering the materiality of their economic and GHG emissions contribution.

96 See the Greenhouse Gas Protocol methodology at https://ghgprotocol.org/sites/default/files/standards_supporting/FAQ.pdf.

97 See, for example, Rissman J. et al. (2020), who insist that the role of supply-side technologies includes energy efficiency (especially at the system level), carbon capture, electrification, and zero-carbon hydrogen as a heat source and chemical feedstock. The authors underline that there are also promising technologies specific to each of the three top-emitting industries: cement, iron and steel, and chemicals and plastics. These include cement admixtures and alternative chemistries, several technological routes for zero-carbon steelmaking, and novel chemical catalysts and separation technologies.

■ Incorporation of just transition issues into the design of alignment approaches

The Just Transition involves managing change in carbon-intensive and hard-to-abate industries from a social and employment perspective. Current and persistent gaps in aligning capital flows with just transition objectives indeed justify an integration of these priorities into alignment approaches following initially limited market recognition of the need to address socioeconomic impacts of the decarbonization process. This paper provides guidance on a series of components to integrate when designing an alignment approach, especially a taxonomy or a transition planning framework. Among them is the identification of sectoral dynamics that are prone to bear substantial and specific employment and social impacts, by mapping at the national or regional level, or both, job losses, gains, reallocations, and displacements across sectors that are included in the alignment approach.

Principle 2: Defining and identifying “significant harm” through supply chains and implementing a due diligence process

■ Definition of “significant harm” through supply chains

The paper stresses that operational design issues involve the definition of “significant harm”—including *how far* harm is assessed through subsidiaries and supply chains. From a data and disclosure perspective, as mentioned previously, challenges would arise when an assessment should be undertaken throughout the supply chain (O’Rourke 2014), regarding issues such as lack of overall transparency, reliance upon averages, level of trust in supplier certifications, capacity of suppliers to undertake the analyses, and so forth.

■ Implementation of a two-tiered approach to assessing significant harm, including the implementation of a due diligence process

Following the rise of risk-based due diligence processes and methodologies in recent years, an increasing number of policies, laws, and regulations now require companies to undertake due diligence on human rights and environmental risks and impacts in their operations and supply chains. Yet, in view of the challenges of performing such due diligence, this paper provides suggestions on the implementation of a two-tiered approach. The approach involves (a) compliance with minimum relevant international, regional, and national environmental and social regulations and laws and (b) the implementation of a broader Responsible Business Conduct due diligence to cover supply chains beyond companies’ own operations. The OECD MNE Guidelines adopt a risk-based approach to identify, prevent, mitigate, and account for how companies address these actual and potential adverse impacts in their own operations, their supply chain and other business relationships.

This approach may be apprehended in close relation with the sectoral prioritization. As recommended by Schneeweiß (2020), the identification of “high-risk social sectors” as a step preceding the verification of social standards (related to employment and to broader social sustainability) would allow for a more robust integration of social challenges in alignment approaches such as taxonomies.

Principle 4: Disclosure of Scope 3 GHG emissions and specific challenges for SMEs

■ Adjustment of disclosures by SMEs and, more generally, companies in EMDEs

Because of the lack of available and robust data, fewer disclosures should be expected from companies further down the supply chain (due to the associated costs). However, reinforcing transparency is a crucial challenge (as mentioned). The paper therefore underlines that prioritizing key metrics is a solution. The metrics may include the following: the main sectors and activities in which the company operates; Scope 1 and 2 GHG emissions, which can be integrated into Scope 3 for larger entities; and the potential magnitude of excluded GHG emissions.

Disclosure regimes for SMEs may focus on being designed in a way that strengthens their ability to secure contracts with buyers along supply chains and to gain access to finance from banks due to their climate credentials.

Principle 6: Transition planning

■ Incorporation of supply chain considerations into the design of transition plans

The paper explores several (complementary) solutions; among them: (a) the opportunity to detail options that allow for effective inclusion of supply chain criteria and targets in transition plans, involving the criteria for decarbonization, which may be focused on the most efficient abatement levers (most of which would be readily available and affordable, depending on countries and industries) especially regarding raw material inputs and intermediary products); (b) the inclusion of an internal carbon pricing mechanism (useful guidance is provided by CDP 2022b), notably to incentivize innovation (for example, reporting and incentive systems to reward innovative carbon-reduction work; see Spiller 2021); and (c) the adoption of a sustainable procurement policy (see CDP 2022a).

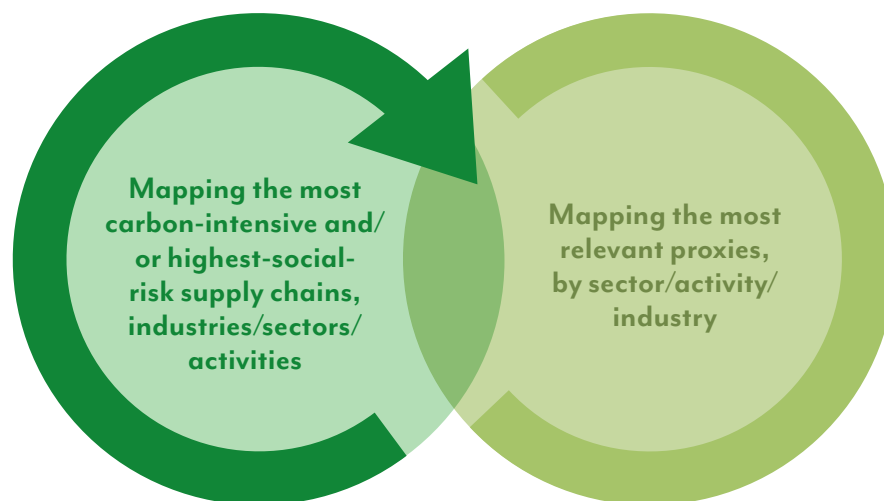
■ The design of simplified transition plans for SMEs

Simplified transition plans would involve focusing on key implemented and planned actions for decarbonization and on other climate-related initiatives undertaken and planned. Firms could therefore focus on aligning their operations to keep their position in global supply chains or could structure their operations to benefit from domestic preferential financing opportunities in support of a transition.

The way forward: Suggestions for advancing further the integration of the supply chain issue in climate alignment approaches

The design of supply chain-specific proxies would enable more granular materiality assessment by entities and financial market participants (figure A.1). It would reduce the need for additional verification while promoting greater interoperability across alignment approaches. This effort would be feasible primarily from a risk perspective (minimum social safeguards) rather than from an impact perspective (do no significant harm that may require a more granular assessment (threshold or binary criteria)). Principle 2 details the range of proxies that are commonly used (including the UN Global Compact principles, IFC Performance Standards, and others), but asset and entity-level approaches may require more granular, sector-oriented assessments.

Figure A.1: Supply chain mapping

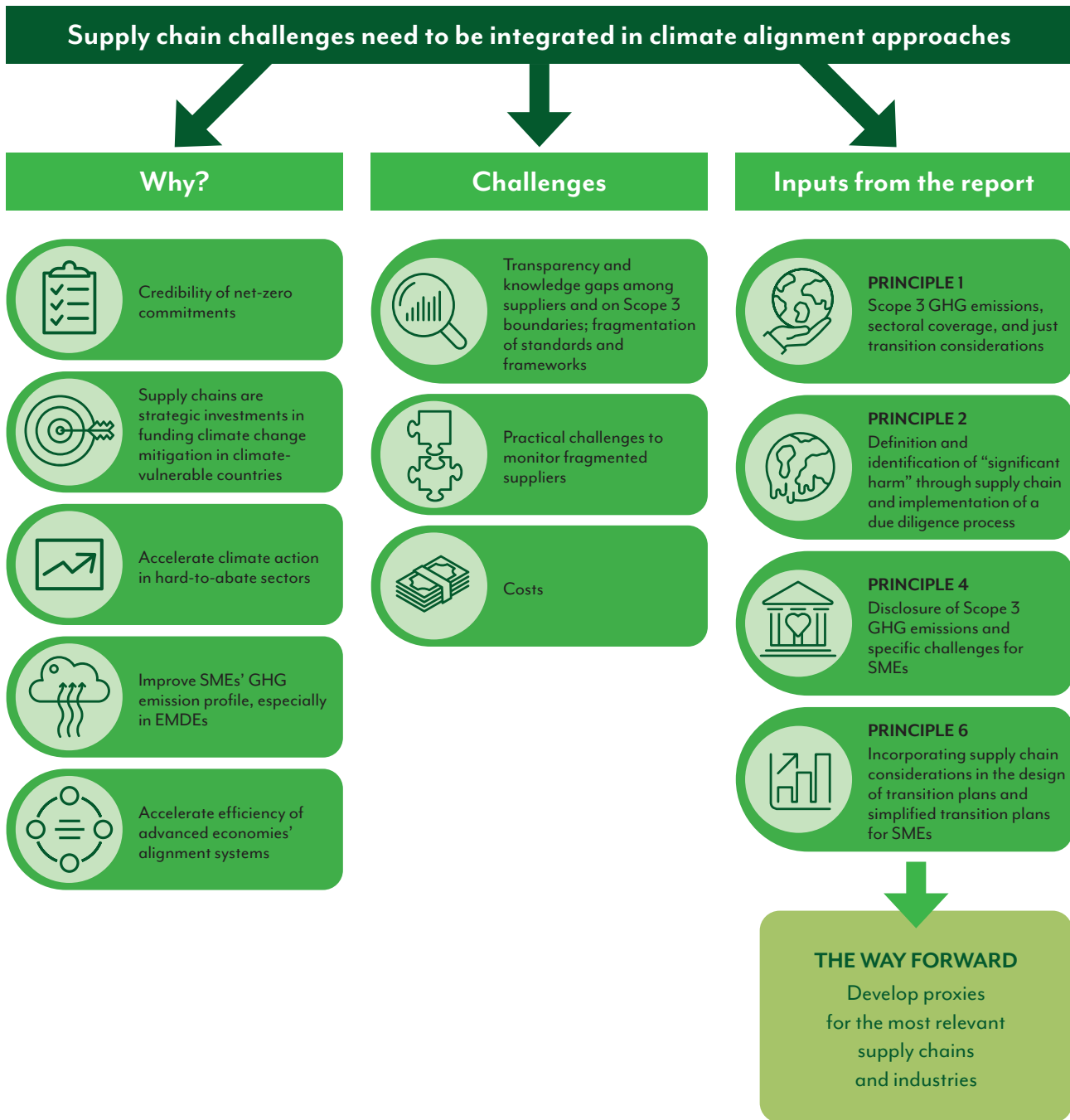


Source: Original figure for this publication.

The objective would be to facilitate the implementation of technical criteria, reducing the need for additional verification. Following a mapping of the most carbon-intensive or highest-social-risk supply chains, it would be useful to identify material risks, impacts, and key performance indicators, before identifying similarities and gaps across key legislation across jurisdictions—at least with a climate change mitigation lens. This process would be in line with the OECD guidance regarding responsible business conduct, anchored in the concept of a “risk-based approach,” which in practice involves businesses tailoring their efforts to the nature, likelihood, and severity of risks to people, the planet, and society. It also means prioritizing a business’s most significant risks and adverse impacts first—wherever it sits in the value chain, not based on where enterprises have the most influence or whether the impacts represent a risk to the business. The use of the World Benchmarking Alliance sectoral benchmarks may be helpful as well. ISO standards (such as Standard ISO 14091:2021, Adaptation to Climate Change—Guidelines on Vulnerability, Impacts and Risk Assessment) could feed into the process.

Challenges would mostly amount to potential difficulties in verifying proxies (such as the lack of capacity of financial institutions), a potential increase in verification costs resulting from the mandatory application of ISO standards, and the lack of comparability or minimum ground between legislation and policies. These challenges should be closely taken into consideration in the future in order to mitigate them as much as possible and ensure the usability of the proxies. See figure A.2.

Figure A.2: Options for overcoming challenges in integrating supply chains into climate alignment approaches



Source: Original figure for this publication.

Note: EMDEs = emerging markets and developing economies; GHG = greenhouse gas; SMEs = small and medium enterprises.

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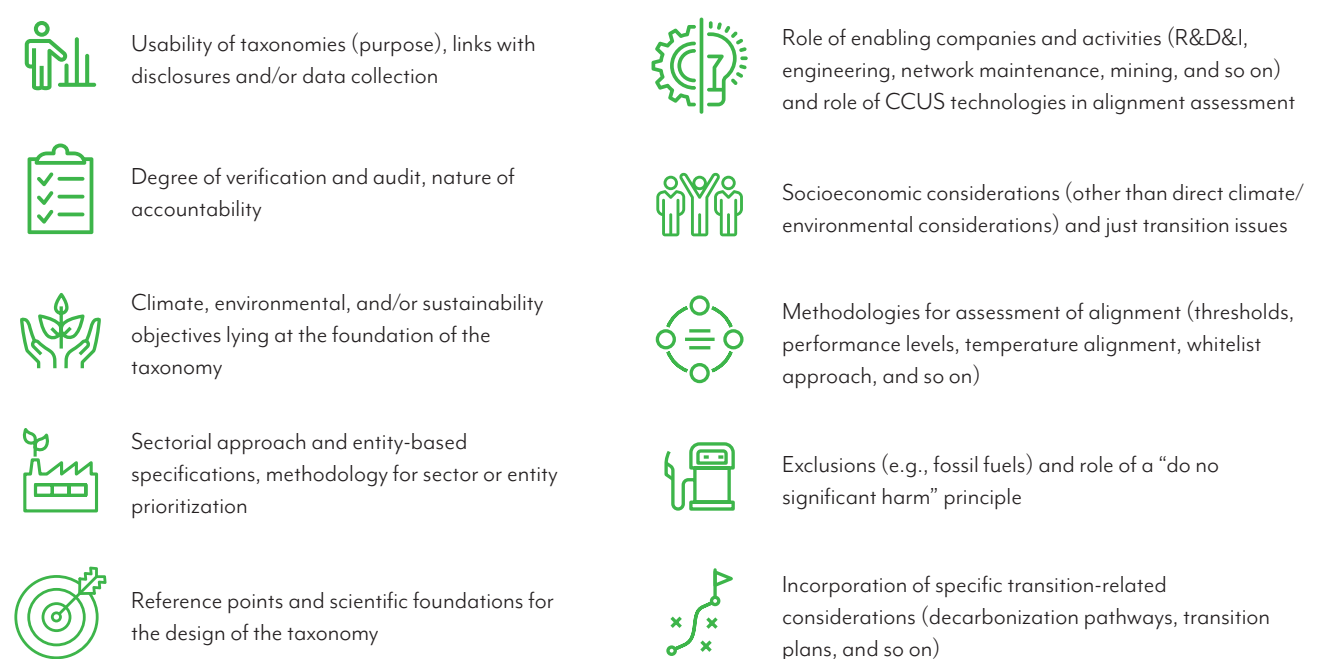
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APPENDIX **B** Main Conclusions from the Comparative Analysis

Figure B.1: Variations across taxonomies



Source: Original figure for this publication.

Note: CCUS = carbon capture, utilization, and storage; R&D&I = research, development, and innovation.

Taxonomies listed in table B.1 and B.2 and shown in figure B.2 include those under development/consideration, those under development and those that have been published as of August 2023. The table is a product of the study team’s own analysis of taxonomies and its own judgment based on publicly available information as to the taxonomies’ features. The analysis remains subject to any discussions with authorities and organizations in charge of their development and implementation, and the taxonomies remain subject to change given their evolving nature. Examples of taxonomies provided between parentheses are not necessarily comprehensive and may also be subject to change.

Table B.2 lists the taxonomies by status of implementation and provides definitions for the country and organization abbreviations.

Table B.1: Detailed analysis of differences among taxonomies

Use of the taxonomy in the sustainable finance framework	Link to G-20 SFWG Principle	Key issues in taxonomies (published and in development)
<p>Data and Links to Disclosures</p> <p>Standalone taxonomy and/or multiple applications and/or component of a sustainable finance standard or regulation</p>	<p>PRINCIPLE 4: Reflect good governance and transparency</p>	<p>Most taxonomies support a variety of strategic purposes, including the following:</p> <ul style="list-style-type: none"> ■ Leverage the taxonomy in the design and structuring of green/sustainable finance solutions and services to accelerate development of green/low-carbon sectors and activities, and decarbonization efforts (AU, RU, ASEAN, CN, SA, MY, BD, MN, ID, EU, CL, VN, SG, UK, PH, TH, MX) ■ Regular monitoring of allocation of credit/financing/investment to green/low-carbon sectors of the economy (ASEAN, CA, CN, SA, MY, BD, MN, ID, EU, CL, LK, BR, CO, VN, UK, IN, PH, TH, MX, NZ) ■ Common language to communicate and coordinate on labeling for economic activity and financial instruments (CA, CN, SA, MY, BD, MN, ID, EU, CL, SG, IN) ■ Overarching capacity building guidance in financial markets (RU, ASEAN, SA, BD, CL, BR, SG, IN, PH) ■ Facilitate standardized classification and reporting of climate-related exposures to support risk assessments at institution and systemic levels (ASEAN, MY, EU, LK, PH, MX) ■ Strengthen accountability and market transparency, often linked to avoiding greenwashing practices (ASEAN, CA, CN, SA, MY, EU, CL, SG, UK, PH, MX) ■ Encourage financial flows toward supporting climate-related objectives (AU, RU, ASEAN, CA, CN, SA, MY, BD, ID, EU, CL, BR, CO, SG, UK, PH, MX, NZ) ■ Data dissemination and solving for the current lack of information on the carbon reduction potential of projects and programs—sometimes referred to as a “sustainable pipeline database” (ASEAN, MY, BD, ID, IN, PH) <p>Some projects also contain more specific goals related to shareholder engagement, the reduction of barriers and access to financing, the development of transition/sustainability-linked bonds and loans, and strategic planning at the corporate or financial institution level.</p>

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Use of the taxonomy in the sustainable finance framework	Link to G-20 SFWG Principle	Key issues in taxonomies (published and in development)
<p>Data and Links to Disclosures</p> <p>Role in the broader disclosure framework</p>	<p>PRINCIPLE 4: Reflect good governance and transparency</p>	<p>A taxonomy is mostly a standalone project to support financial markets in capital allocation toward green, low-carbon, and sustainable projects, except for some cases in which it is most directly related to disclosures:</p> <ul style="list-style-type: none"> ■ The EU sustainable finance regulatory framework sits at the core of a set of dedicated pieces of legislation (including Sustainable Finance Disclosure Regulation, Pillar 3 for credit institutions, EU Green Bond Standard, Ecolabel for financial products, CSRD, MiFID II, and so on). South Africa has also followed a similar disclosure-linked path. ■ MDBs' commitment to applying Common Principles for Climate Mitigation Finance Tracking in their tracking and reporting of climate change mitigation finance. ■ China's green bond–endorsed project catalogue, whose use is mandatory for green bond issuance (and other types of sustainable issuance)^a <p>Taxonomies developed by financial institutions, financial associations, and nongovernmental organizations (for example, the Climate Bonds Initiative and commercial banks such as Santander and Natixis) are most often associated with reporting requirements that may vary by instrument and stakeholder. The objective across these taxonomies is to provide a classification system of projects and assets according to their green credentials to enable aggregation of data and other details (such as prevented GHG emissions, committed loan amounts, the sectoral breakdown, financial instrument breakdown, and so on) about transactions under each category by portfolio.</p> <ul style="list-style-type: none"> ■ A few frameworks emphasize disclosures when the taxonomy is related to bond and loan issuance on a regulatory or semi-regulatory basis (ID, MN, CA). Japan's 2021 Basic Guidelines on Climate Transition Finance are aligned with ICMA's transition finance handbook (in terms of transition bonds and sustainability-linked instruments) and suggest that a potential taxonomy would serve as the reference point for the publication of a transition strategy. Canada and Australia indicated in their roadmaps for sustainable finance that a taxonomy would apply to issuers of green/transition instruments with both an entity-level net-zero target disclosure and specific assessment of the project's qualification under a taxonomy. ■ The Indonesian experience provides a useful example of the taxonomy standing as a guideline for financial market participants in allocating their financing, as well as their green portfolio recordkeeping. As such, Indonesian regulators have enhanced the need to refine current reporting requirements to align them with the taxonomy's criteria. ■ The Bangladesh framework aims to establish closer links between the sustainable finance taxonomy and disclosure requirements, at a minimum in some key fields of financing (agriculture, small and medium businesses, and so on). A similar approach prevails for the ASEAN (promoting sustainability disclosures and determine if a particular mandatory or voluntary standard can be adopted).
<p>Data and Links to Disclosures</p> <p>Nature of accountability for usage/alignment; type of verification</p>		<p>Given the relative emphasis, at this stage, on disclosures related to the taxonomy at corporate or asset levels across jurisdictions, only a few frameworks provide details regarding verification and auditing:</p> <ul style="list-style-type: none"> ■ Mandatory auditing and assurance are required as part of the EU framework. ■ In China, project evaluation and assessment in bond issuance depends on the taxonomy (such as green financial bond, green enterprise bond, green corporate bond, and green financing instrument). Third-party verification is either encouraged or needs to be approved by the National Development and Reform Commission. ■ Regarding bond issuance frameworks (MN, RU), most are associated with third-party verification and certification programs. ■ The Climate Bonds Taxonomy is associated with the Climate Bonds Standard and Certification Scheme. Third-party verification is required and, while certification is not against the Climate Bonds Taxonomy, it is related to it. ■ Taxonomies that are nonmandatory typically do not require third-party verification or certification regarding taxonomy alignment. However, for bond issuances, the Climate Bonds Taxonomy is associated with the Climate Bonds Standard and Certification Scheme, where third-party verification is required. Certification is not issued against the taxonomy but is related to it.

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Use of the taxonomy in the sustainable finance framework	Link to G-20 SFWG Principle	Key issues in taxonomies (published and in development)
<p>Data and Links to Disclosures</p> <p>Type of enforcement and/or incentive to use</p>	<p>PRINCIPLE 4: Reflect good governance and transparency</p>	<p>ENFORCEMENT</p> <p>Except for the EU, Chinese, and Russian frameworks, all other taxonomies (or ongoing projects) are voluntary by nature.</p> <p>Enforcement is therefore little developed at this stage, except where taxonomy-related disclosures form part of broader disclosure-based regulatory frameworks (and their enforcement characteristics).</p> <p>INCENTIVES</p> <ul style="list-style-type: none"> ■ Little to no tax incentive in the majority of taxonomy initiatives. ■ Fund and/or loan label (such as the People's Bank of China's Carbon Emission Reduction Facility). ■ Green (and/or sustainability) bond issuance and potential related economic/financial incentives, such as subsidies for transaction costs.^b
Objectives		
<p>Design</p> <p>Climate and/or other environmental/sustainability goals</p>	<p>PRINCIPLE 1: Material positive contribution to sustainability goals</p>	<p>Despite differences across all existing taxonomies (and ongoing projects), some goals stand out:</p> <ul style="list-style-type: none"> ■ Climate change mitigation is a primary objective (as in EU, ASEAN, SA, CO, MN, MY, SG, and others). Although these frameworks also make provision for a broader environmental approach, their design has so far focused on climate change mitigation. ■ In most taxonomies, a multi-objective approach seems to be preferred (often not in an encompassing way through, for example, specific activities/sector/assets for a specific objective). As such, the EU Taxonomy's six objectives have greatly influenced other initiatives across the world (including ASEAN, SA, MN, SG, and RU). ■ Only a few frameworks have included energy efficiency (UK), as well as adaptation and/or climate resilience (mostly in EMDEs—including ASEAN and Mexico—and the EU). ■ Sustainable Development Goals are mostly preferred in India and Mexico, with a focus on environmental/climate SDGs. ■ A few countries directly relate objective setting to their national and context-based environmental policy priorities (such as reduction of air pollution in the Russian Federation, protection of biodiversity and focus on land-use in Colombia, focus on livelihood improvement in Mongolia and Indonesia, resource resilience in Singapore, pollution prevention and control and energy efficiency in China, sustainable cities in Mexico). <p>Decoupling economic growth from resource use and environmental impacts is a primary objective for the taxonomy in the ASEAN regions (and some jurisdiction-specific frameworks developed within the region).</p>
<p>Design</p> <p>Timeline setting</p>		<p>Many taxonomies incorporate specific timelines (including among those putting an emphasis on transition and decarbonization pathways).</p> <p>These include, but are not limited to, in Colombia, a GHG emission reduction target of 51% by 2030 and carbon neutrality by 2050; in Malaysia, a GHG reduction target of 45% by 2030; in Russia, a net-zero objective by 2060; in South Africa, a GHG reduction target by 2030 to 350-420 MtCO₂-eq; in the ASEAN, a taxonomy based on specific baseline scenarios; and in the EU, a carbon neutrality objective by 2050.</p>
<p>Design</p> <p>Definition of (substantial) contribution</p>		<ul style="list-style-type: none"> ■ Most often a distinction is made between “focus sectors” for low-carbon economic development and transition and “enabling sectors.” ■ A few frameworks emphasize the role of enabling sectors in contributing to climate change mitigation (including EU, ASEAN, CL, and CA), such as information and communication technologies; professional, scientific, and technical activities; CCUS, and so on.

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Use of the taxonomy in the sustainable finance framework	Link to G-20 SFWG Principle	Key issues in taxonomies (published and in development)
When “climate” is the primary objective		
<p>Design</p> <p>Objective set as carbon neutrality or reduction of GHG emissions</p>	<p>PRINCIPLE 1: Material positive contribution to sustainability goals</p>	<ul style="list-style-type: none"> ■ All taxonomies include at least climate change mitigation as an objective and most define substantial contribution under this objective through GHG reduction targets. ■ Only a few taxonomies are based on a common definition of carbon neutrality (including EU, PH, MY). ■ In the ASEAN/MY/PH taxonomies, there is a focus on the distinction between <ul style="list-style-type: none"> ◆ Induced emissions (reducing its own GHG emissions, as an absolute real flow of GHG added to the atmosphere emissions) ◆ Avoided emissions (reducing others' GHG emissions, as a difference in GHG emissions compared to a reference scenario) ◆ Negative emissions (developing carbon sinks, as the absolute real CO₂ flows out from the atmosphere). <p>Such distinction is adopted in the ICMA's Impact Reporting Handbook (here), as well as in the Carbone 4 Net-Zero Initiative (here).</p> <ul style="list-style-type: none"> ■ A few frameworks across the world (including MY, EU, CL, and CO) emphasize the development of nature-based solutions that have wider benefits for enhancing carbon sinks (such as advanced soil and farming management techniques, afforestation and reforestation of terrestrial forests, sustainable forest management and restoration of wetland areas, and so on).
<p>Design</p> <p>Coverage in GHG emissions and methodology; role of LCA</p>		<p>Only a few frameworks have specified the approach in GHG reporting, and life cycle analysis:</p> <ul style="list-style-type: none"> ■ These methodological principles are key in the EU regulatory framework, the ASEAN framework, and South Africa.
<p>Design</p> <p>Role of other socioeconomic considerations</p>	<p>PRINCIPLE 1: Material positive contribution to sustainability goals</p> <p>PRINCIPLE 2: Avoid negative contribution to sustainability goals</p>	<p>A growing number of projects emphasize other socioeconomic considerations as part of screening criteria (other than direct climate and/or environmental objectives), for instance:</p> <ul style="list-style-type: none"> ■ Minimum social safeguards (in the EU, BD, MX, SA, CL, AU, and TH, for example) based on international standards ■ Social eligibility standards in the classifications of some financial institutions and organizations (such as SBTi, Natixis, and Santander) ■ Relation to specific local laws in MY (such as labor laws and child protection regulations) and IN. <p>Except for taxonomies that adopt an SDG-related approach (MX, IN), or for the social taxonomy project in the EU, only Georgia and Malaysia have adopted social or socioeconomic objectives as a <i>primary</i> lens of assessment for sectors/activities/entities/assets. South Africa is considering the development of a social taxonomy as well.</p>

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Use of the taxonomy in the sustainable finance framework	Link to G-20 SFWG Principle	Key issues in taxonomies (published and in development)
Strategic driver		
<p>Design</p> <p>Entry points guiding criteria setting; role of science</p>	<p>PRINCIPLE 5: Science-based approaches</p>	<ul style="list-style-type: none"> ■ The progress on implementation of NDCs is diverse among countries having implemented a taxonomy project (whether the application is nascent, engaged, capable, or effective, and whether the NDC is fully mainstreamed into environmental and industrial policy—even financial planning, used for coordination purposes only, and associated with measurement reporting and verification practices). Often these differences are reflected in the taxonomy objectives. ■ While most taxonomies refer to the Paris Agreement, they may also differ substantially, by taking into close consideration either <ul style="list-style-type: none"> ◆ NDCs (including MY, ID, CA, and SA) ◆ Key reference policy targets (including MN, EU, and CL) ◆ Science-based criteria often referring to global temperature goals and/or policy targets (EU, to some extent; ASEAN; and SBTi classification framework, for example) ◆ Sector-specific technical net-zero road maps, from which may be extracted science-based criteria (JP, for example)
<p>Data and Links to disclosures</p> <p>Use of external accounting standards or other measurements</p>		<p>References to external accounting standards are often scarce. The most common external measures used are the following:</p> <ul style="list-style-type: none"> ■ For taxonomy-alignment reporting: ICMA guidelines are often referred to (especially in Central and Latin American countries; to a lesser extent elsewhere) for impact reporting, green bond reporting, or transition finance. ■ For GHG measurement: ISO norms and/or GHG Protocol are mostly referred to across taxonomies. <p>Reference to certification systems in some key specific sectors (such as buildings, agriculture, and so on), and sometimes national/regional regulations in these sectors, are also often incorporated in taxonomies across jurisdictions.</p>

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Use of the taxonomy in the sustainable finance framework	Link to G-20 SFWG Principle	Key issues in taxonomies (published and in development)
Scope and level of analysis		
<p>Design</p> <p>Methodology for alignment assessment (performance threshold, activity or asset-based criteria, impact-based analysis, and so on)</p>		<p>Methodologies differ substantially across taxonomies:</p> <ul style="list-style-type: none"> ■ Some taxonomies are principles based, with qualitative assessments on their contributions (MY), others adopt a “whitelist” approach that lists eligible technologies (CN, EU for manufacturing of energy-efficient equipment for buildings) ■ Absolute emissions thresholds or thresholds based on the average emissions of new products available (such as ASEAN, EU, MN, and BD). Thresholds often need to be simple and quantifiable as well as transparent to allow investors to understand whether this aligns with their expectations of “green” ■ Performance thresholds (EU, ASEAN, and so on) ■ Regulatory (qualitative) criteria (ID, and so on)
<p>Design</p> <p>Distinction between types of material contribution to the objective</p>		<p><i>See previous sections on substantial contribution versus enabling activities</i></p>
<p>Design</p> <p>Sectorial coverage</p>	<p>PRINCIPLE 1: Material positive contribution to sustainability goals</p>	<p>Selection of priority sectors often includes an assessment of</p> <ul style="list-style-type: none"> ■ GHG emissions/materiality of the sector from GHG perspective; ■ Contribution to GDP; and ■ National priorities. <p>They may sometimes also account for foreign direct investment flows and capital flows for the sectors. Three main approaches stand out:</p> <ul style="list-style-type: none"> ■ Key sectors and activities to achieve climate change mitigation as a first entry point (EU, SG, ASEAN, IN): either based on total GHG emissions—such as EU (80%), ASEAN (85%), and SG (90%)—and/or on gross value added (ASEAN, SN). ■ Specific sectors from the outset, including hard-to-abate ones (often as a result of national priorities or capacity constraints and selected based on their share/contribution/materiality of GHG emissions): RU, SG, MY, EU, and so on. ■ A whitelist approach: CN, IN (for adaptation purposes), but based on national priorities/GHG materiality/GDP share and so on. <p>Generally, there is a list of sectors per objective (CBI, MO) climate change mitigation: renewable energy, low pollution energy, energy efficiency, and so on.</p> <p>Some approaches (BD, IN, and so on) adopt a whitelist approach, in addition to or in lieu of listing activities per specific policy objective (such as sustainable agriculture, CMSME, socially responsible finance, and so on).</p> <p>Taking into consideration entity-level specificities is not a principle shared across all current frameworks, since entities often pursue a collection of authorities. In addition to the EU framework that closely links asset- and entity-level approaches, for instance, AU is proposing an approach that considers entity-level contribution for use-of-proceeds financing (in which an entity has a credible globally recognized transition plan/emissions target, or disclosures).</p>

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Use of the taxonomy in the sustainable finance framework	Link to G-20 SFWG Principle	Key issues in taxonomies (published and in development)
<p>Design</p> <p>Sectorial exclusion and underlying rationale; harmful (or equivalent) counterpart</p>	<p>PRINCIPLE 2: Avoid negative contribution to sustainability goals</p>	<p>Only a few taxonomies exclude sectors from the outset based on their significant harm to a climate or environment-related objective, such as</p> <ul style="list-style-type: none"> ■ ASEAN, EU, RU (production of solid fossil fuels—that is, thermal coal and lignite) ■ Malaysia (“brown” sectors) ■ Bangladesh (illegal deforestation, illegal waste management, use of fire for land clearance, agriculture, urbanization) ■ Private sector classifications often seem to exclude the most carbon-intensive sectors (primarily <i>all</i> fossil fuels). <p>There is no clear rationale at this stage between taxonomies, and this issue involves highly sensitive considerations balancing scientific and political factors (such as the role of natural gas and associated thresholds for GHG emissions; the role of unconventional fossil fuels such as tar sands, oil shale, shale gas, and deepwater oil in transition policies; and so on).</p> <p>The ASEAN Taxonomy Framework has introduced coal phaseout as an activity which may be classified as green or amber under the Plus Standard framework (June 2023). In addition, the Monetary Authority of Singapore is contemplating the inclusion of managed coal phaseout under the Singapore-Asia Taxonomy (June 2023⁶).</p>
<p>Data and Links to disclosure</p> <p>Use of statistical classification systems</p>	<p>PRINCIPLE 1: Material positive contribution to sustainability goals</p>	<p>Systems codify a standard format for organizing detailed information about the state of an economy, allowing economic data to be collected and reported in a format suitable for economic analysis, decision-making, and policy making.</p> <p>When they do, taxonomies most often refer to substantially different statistical/industrial classification systems, making it difficult to identify and collect data across the world. However, there is a good, if not perfect, level of interoperability between ISIC and many national systems based on ISIC.</p> <ul style="list-style-type: none"> ■ ASEAN, Malaysia, India, Singapore: ISIC ■ Chile: national system ■ Russia: national system ■ China: national system ■ EU : NACE classification code system

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Use of the taxonomy in the sustainable finance framework	Link to G-20 SFWG Principle	Key issues in taxonomies (published and in development)
Use of a do no harm principle		
<p>Design</p> <p>Role of the principle in the design and use, definition</p>	<p>PRINCIPLE 2: Avoid negative contribution to sustainability goals</p>	<p>An economic activity is location and context specific, and interacts directly/indirectly with the surrounding environment, potentially causing unintended harm to its broader environment. Many taxonomies differ in their understanding and characterization of “harm” (when they do not use a whitelist approach). The link to “transition” is not always straightforward either. Some examples:</p> <ul style="list-style-type: none"> ■ Identification of specific environmental objectives: EU, MY, ASEAN, MX, SA, CO, RU, IN, and so on. ■ Use of the “remedial efforts” concept by the ASEAN/Malaysia taxonomy (that is, actions that anticipate and avoid risks and impacts at the outset, or at the very least minimize or reduce risks and impacts to acceptable levels) that aim at reinforcing the transition finance aspect. More broadly, EU, ASEAN, RU, CO, MY, and CL frameworks refer to specific thresholds, processes, and/or measures to undertake. ■ In the MY framework, there is a clear risk acceptance criterion for informed decision-making, particularly in assessing whether the economic activity and overall business are at risk of causing significant harm to the environment. ■ As for financial institutions, they often use “social and environmental risk management principles” that encompass precautionary prudential principles in assessing social and environmental risks through identification, measurement, mitigation, supervision, and monitoring processes. ■ In the Indian framework, there is a distinction between (a) generic DNSH that establishes the process which the project developer needs to follow through entity-level strategies (such as by environmental and social impact assessments); (b) activity-level DNSH, composed of technical screening criteria used at the activity level to account for activity-specific social and environmental risks that arise owing to the installation and operations of any project; and (c) measuring minimum safeguards, by following the existing NGRBC guidelines and parameters contained in the SEBI BRSR.
<p>Design</p> <p>Methodology for assessment</p>		<p>Only a few frameworks provide some degree of methodological guidance regarding the assessment of alignment:</p> <ul style="list-style-type: none"> ■ EU frameworks, as is embedded into law (July 2021 Delegated Act under Article 8 of Regulation (EU) 2020/853 and FAQs/reports from the EU Platform on Sustainable Finance), alongside the mandatory requirement of third-party verification for disclosures. ■ ASEAN, with a principle that breadth and depth of the assessment should be proportionate to the scale of business operations. ■ EU and ASEAN provide guidance as to the due diligence for small or medium-size companies versus enhanced scrutiny for large business operations (such as an environmental impact assessment). ■ In MY, certification serves as a starting point for financial institutions to understand the assessment criteria used as well as the strength of emphasis placed on specific climate and/or environmental objectives (usually very qualitative).

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Use of the taxonomy in the sustainable finance framework	Link to G-20 SFWG Principle	Key issues in taxonomies (published and in development)
Transition considerations and evolution of the taxonomy		
<p>Design</p> <p>Dynamic nature of criteria, assessment methodology, and relation to road maps/pathways</p>	<p>PRINCIPLE 3: Be dynamic in adjustments reflecting changes in policies, technologies, and state of the transition</p> <p>Principle 6: Address transition considerations</p>	<p>Transition taxonomies have been gaining traction globally—with CA, the EU, ASEAN, MY, TH, and SG considering or developing transition taxonomies at this stage. Other jurisdictions are incorporating transition-related criteria and processes into their existing taxonomies or taxonomy projects (RU, LK, UK, and so on).</p> <p>There are broadly three different approaches to transition in taxonomies to date:</p> <ul style="list-style-type: none"> ■ Transition whitelist approach (ID, CAN, JP, RU, LK). Distinction between a positive impact to the environment (no specific thresholds) and those with business benefits for environmental protection (such as CCUS technologies for coal-fired power plants, restoration of gas pipelines to reduce CH₄ leakage, use of recycled materials in manufacturing/clothing/consumer goods, fuel shifting in shipping, among others). ■ Dynamic “pathway” approach, often on a continuum from significant harm to significant contribution. (EU), where it is sometimes referred to as a “traffic light approach.” Also, ASEAN, SG, TH, and, to a lesser extent, MY. <ul style="list-style-type: none"> ◆ The following two figures illustrate the EU approach and the ASEAN approach, respectively. <div style="text-align: center;"> <p>EU approach</p> <p>FUTURE EXTENDED TAXONOMY</p> <p>The diagram illustrates the EU approach to transition taxonomies. It shows a 2x2 matrix of performance levels (SH, Intermediate, SC) against thresholds (DNSH, SC). Activities are categorized into four boxes: BOX 1 (excluded), BOX 2 (prioritised), BOX 3 (to be included), and BOX 4 (might be classified). A timeline shows the evolution of activities A, B, C, D, and E from 2020 to 2050.</p> <p>Explanatory note: Splits in performance levels are for each of the six environmental objectives. For some objectives, there are currently no SC criteria e.g. water and biodiversity objectives</p> <p>Extended Taxonomy</p> <p>2020: A (green), B (yellow), C (red), D (grey)</p> <p>2035: A (green), B (green), C (red), D (grey)</p> <p>2050: A (green), B (green), E (green), D (grey)</p> <p>Legend:</p> <ul style="list-style-type: none"> Green circle: Site/project/activity/investments that Substantially Contributes (SC) Yellow circle: Site/project/activity/investments that is between SH and SC Red circle: Site/project/activity/investments that is Significantly Harmful (SH) Grey circle: Site/project/activity/investments that has No Significant Impact </div>

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Use of the taxonomy in the sustainable finance framework	Link to G-20 SFWG Principle	Key issues in taxonomies (published and in development)				
<p>Design</p> <p>Dynamic nature of criteria, assessment methodology, and relation to road maps/pathways</p>	<p>PRINCIPLE 3: Be dynamic in adjustments reflecting changes in policies, technologies, and state of the transition</p> <p>Principle 6: Address transition considerations</p>	<p style="text-align: center;">ASEAN approach</p> <div style="border: 1px solid black; padding: 10px; margin-bottom: 10px;"> <p style="text-align: center; background-color: #1a3d4d; color: white; padding: 5px;">Foundation Framework (FF)</p> <p style="text-align: center;">Qualitative based sector-agnostic screening criteria and decision flow</p> <p style="text-align: center;">↓</p> <div style="display: flex; justify-content: center; gap: 20px;"> <div style="background-color: #4CAF50; padding: 5px; border: 1px solid black;">Green - FF</div> <div style="background-color: #FFC107; padding: 5px; border: 1px solid black;">Amber - FF</div> <div style="background-color: #F44336; padding: 5px; border: 1px solid black;">Red - FF</div> </div> </div> <div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center; background-color: #1a3d4d; color: white; padding: 5px;">Plus Standard (PS)</p> <p style="text-align: center;">Technical Screening Criteria for 6 Focus Sectors and 3 Enabling Sectors</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Focus Sectors</th> <th style="width: 50%; text-align: center;">Enabling Sectors</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"> <ol style="list-style-type: none"> 1. Agriculture, forestry & fishing 2. Electricity, gas, steam and air conditioning supply 3. Manufacturing 4. Transportation & storage 5. Water supply, sewerage, waste mgmt. 6. Construction & real estate </td> <td style="vertical-align: top;"> <ol style="list-style-type: none"> 1. Information & communication 2. Professional, scientific & technical 3. Carbon capture, storage & utilisation </td> </tr> </tbody> </table> <p style="text-align: center;">↓</p> <div style="display: flex; justify-content: center; gap: 10px;"> <div style="background-color: #4CAF50; padding: 5px; border: 1px solid black;">Green - Tier 1</div> <div style="background-color: #FFC107; padding: 5px; border: 1px solid black;">Amber - Tier 2</div> <div style="background-color: #FF9800; padding: 5px; border: 1px solid black;">Amber - Tier 3</div> <div style="background-color: #F44336; padding: 5px; border: 1px solid black;">Red - PS</div> </div> </div> <p>■ Remedial measures to transition (MY, BD) with a focus on innovation: minimization of waste and GHG emissions with reductions in material and energy inputs seen as efficient transition routes for all sectors (such as use of energy efficiency and renewable energy, improvements in business process engineering and operations management, waste management, and so on).</p> <div style="text-align: center; margin: 20px 0;"> </div> <p>All of these three categories nonetheless refer to the concept of “improvement” for carbon-intensive activities (especially those that are not currently zero or near zero emissions), face significant barriers to decarbonization, and/or provide interim solutions for a limited period of time (before being eventually ineligible to the taxonomy such as natural gas power plants using CCUS). Most of these projects require that companies may/must set midterm targets, identify pathways to meet climate objectives, and establish implementation plans to meet the targets over a defined period.</p>	Focus Sectors	Enabling Sectors	<ol style="list-style-type: none"> 1. Agriculture, forestry & fishing 2. Electricity, gas, steam and air conditioning supply 3. Manufacturing 4. Transportation & storage 5. Water supply, sewerage, waste mgmt. 6. Construction & real estate 	<ol style="list-style-type: none"> 1. Information & communication 2. Professional, scientific & technical 3. Carbon capture, storage & utilisation
Focus Sectors	Enabling Sectors					
<ol style="list-style-type: none"> 1. Agriculture, forestry & fishing 2. Electricity, gas, steam and air conditioning supply 3. Manufacturing 4. Transportation & storage 5. Water supply, sewerage, waste mgmt. 6. Construction & real estate 	<ol style="list-style-type: none"> 1. Information & communication 2. Professional, scientific & technical 3. Carbon capture, storage & utilisation 					

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Use of the taxonomy in the sustainable finance framework	Link to G-20 SFWG Principle	Key issues in taxonomies (published and in development)
<p>Design</p> <p>Dynamic nature of criteria, assessment methodology, and relation to road maps/pathways</p>	<p>PRINCIPLE 3: Be dynamic in adjustments reflecting changes in policies, technologies, and state of the transition</p> <p>Principle 6: Address transition considerations</p>	<p>The inclusion of transition considerations into taxonomies currently raises a series of issues (discussed in this technical report), that include the following:</p> <ul style="list-style-type: none"> ■ What is the distinction between sectors (especially for those taxonomies adopting a holistic sectorial approach—that is, ASEAN, EU, JP, and MY), activities, and industrial processes/ technologies in current taxonomies? Given the activity-level nature of most taxonomies, when decarbonization thresholds and pathways are developed, how do these allow for a consistent consideration of transition across and <i>within</i> activities and underlying technologies? ■ Attention to due care to avoid supporting activities that promote long-term carbon lock-in and/ or activities that maintain economic barriers to low-carbon solutions is not advanced at this stage, although lock-in concerns are being addressed by ongoing consultations in the Asia Pacific region (including ASEAN, Singapore on coal phaseout). How will the deployment of transition considerations in taxonomies further include these issues? ■ More broadly, is a multitiered approach (depending on the different starting points of entities undertaking a particular activity) the most efficient way forward (by supporting transitions of activities that are not yet 1.5°C aligned because activities are not technically or economically feasible)? Would it allow for higher GHG emissions for a limited period, while incentivizing progression to lower emissions by having a mechanism whereby those less ambitious tiers have a clearly stipulated expiry year, after which they are no longer applicable, especially in hard-to-abate sectors? How to ensure that this approach does not lead to carbon lock-in? In the EU, activities with environmental performance levels between the TSC for SC and DNSH need to continue to improve their environmental performance levels over time—at least in line with regional and global goals and targets—so they avoid falling back into doing significant harm to the environment in a few years' time. ■ Most taxonomies do not provide complete pathways but, rather, thresholds that are relevant for defined periods and then designed to ratchet down over time through periods of regular review to accommodate changes in policy and technology (EU), or through pathways aiming to promote green investment (TH, SG). To what extent do these different methodologies raise usability and interoperability concerns? ■ There is currently little clarity over what level the threshold will be in the future (though there is often a host of unknown factors at play, such as availability and viability of low-carbon alternatives, pace of transition pathways for hard-to-abate sectors, and nonlinear transition trajectories at the entity level). This will be a challenge in the context of the implementation and evolution of these taxonomies. ■ How to cover economic and/or technological and/or development and/or political barriers, or to a lesser extent the somewhat high degree of dependency of the transition on external factors?
<p>Data and Links to disclosure</p> <p>Implications for reporting/verification/ auditing</p>		<p>Except for taxonomies that have transitional activities and associated reporting systems (especially in the EU), all other taxonomies incorporating a transition approach remain unclear at this stage as to how a company would report according to its position on the pathway and/or color-coding system.</p>
<p>Design</p> <p>Just transition considerations</p>	<p>PRINCIPLE 6: Address transition considerations</p>	<p>Mexico's SDG Taxonomy project and the Indian Taxonomy directly incorporate just transition issues.</p> <p>The use of social eligibility principles in the Santander SFCS aims at tackling—for some sectors—the just transition aspect. This is also the case in Georgia, and South Africa is considering incorporating these issues. The social taxonomy project in the EU takes into consideration these aspects, but the project is still under development without a specified timeline for publication.</p>
<p>Design</p> <p>Principle or rule-based approach in the evolution of the taxonomy</p>	<p>PRINCIPLE 3: Be dynamic in adjustments reflecting changes in policies, technologies, and state of the transition</p>	<p>Only a few taxonomies (such as EU, CA, ASEAN, MY, ID, SA, MN, and SG) tackle the potential evolution in scope and criteria, to reflect technological, scientific, demand, economic, and other relevant developments (nationally, regionally, and globally), with divergences in their approach:</p> <ol style="list-style-type: none"> (a) No specific governance for such evolution (that would be worth specifying, in most taxonomies), or (b) Review every “x” year according to a specific regulation (EU) or subject to institutional review (ASEAN).

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Use of the taxonomy in the sustainable finance framework	Link to G-20 SFWG Principle	Key issues in taxonomies (published and in development)
Design Legacy effects	PRINCIPLE 6: Address transition considerations	Only the EU framework provides for this principle at this stage, while ASEAN and South Africa are contemplating the possibility..
Design / Data and Links to disclosure Use of a dynamic do no harm principle and related methodology in the transition context; implications for reporting/verification/auditing	PRINCIPLE 2: Avoid negative contribution to sustainability goals PRINCIPLE 6: Address transition considerations	The EU framework provides clearly for this principle at this stage for transitional activities, as well as the ASEAN framework (such as an activity which meets the principles for green classification may be temporarily classified as amber if there is outstanding unremediated harm).
Assessment of effectiveness		
Data and links to disclosure Reporting characteristics	Across principles	A few frameworks outside the EU and ASEAN provide for such possibility and/or requirements at this stage.
Data and links to disclosure Application to third countries/regions		Only a very few frameworks tackle this challenge (see appendix A): <ul style="list-style-type: none"> ■ EU example for reporting on taxonomy alignment outside the EU area ■ Application across ASEAN member states ■ MDBs' approach, including through universally aligned and nonaligned lists of activities (Joint MDB Methodological Principles for Assessment of Paris Agreement Alignment of New Operations, June 2023^d).

Source: Original table for this publication.

Note: CBI = Climate Bonds Initiative; CCUS = carbon capture utilization and storage; CH₄ = methane; CMSME = cottage, micro, small, and medium enterprise; CO₂ = carbon dioxide; CSRD = Corporate Sustainability Reporting Directive; DA = delegated act; DNSH = do no significant harm; EMDE = emerging market and developing economy; GDP = gross domestic product GHG = greenhouse gas; ICMA = International City/County Management Association; ISO = International Organization for Standardization; ISIC = International Standard Industrial Classification; LCA = life cycle analysis; MDBs = multilateral development banks; MiFID II = Markets in Financial Instruments Directive II; MtCO₂-eq = metric tons carbon dioxide equivalent; NDCs = nationally determined contributions; NGRBC = National Guidelines on Responsible Business Conduct; SC = substantial contribution; SDG = Sustainable Development Goal; SEBI BRSR = Securities and Exchange Board of India Business Responsibility and Sustainability Reporting; SFCS = Sustainable Finance Classification System; SFWB = Sustainable Finance Working Group; TSC = technical screening criteria.

- a. For a broader perspective on China's sustainable finance definitions and use of taxonomies, see Organisation for Economic Co-operation and Development (OECD), "9. Sustainable Finance Definitions and Taxonomies," Developing Sustainable Finance Definitions and Taxonomies website, 2020. (9. Sustainable finance definitions and taxonomies in China | Developing Sustainable Finance Definitions and Taxonomies | OECD iLibrary [oecd-ilibrary.org] 2020, <https://www.oecd-ilibrary.org/sites/5abe80e9-en/index.html?itemId=/content/component/5abe80e9-en>).
- b. John Caramichael and Andreas Rapp, "The Green Corporate Bond Issuance Premium" (International Finance Discussion Papers 1346, Board of Governors of the Federal Reserve System, Washington, DC, 2022), <https://doi.org/10.17016/IFDP.2022.1346>.
- c. Monetary Authority of Singapore (MAS), "MAS Launches Consultation on Coal Phase-Out Criteria under the Singapore-Asia Taxonomy, June 28, 2023. MAS Launches Consultation on Coal Phase-Out Criteria under the Singapore-Asia Taxonomy," media release, June 28, 2023, <https://www.mas.gov.sg/news/media-releases/2023/mas-launches-consultation-on-coal-phase-out-criteria-under-the-singapore-asia-taxonomy>.
- d. "Joint MDB Methodological Principles for Assessment of Paris Agreement Alignment of New Operations—Direct Investment Lending Operations," version 1.0, June 2023, World Bank, <https://documents1.worldbank.org/curated/en/099146306162392732/pdf/IDU0562589c907e1f047980b1b50e63bf0f19447.pdf>.

Table B.2: Status of referenced taxonomy implementation as of August 2023 incorporated into the analysis

Status	Country/Region (and links, where available)
In place	Bangladesh (BD) • China (CN) • Colombia (CO) • European Union (EU) (27 member states) • Georgia (GE) • Indonesia (ID) • Kazakhstan (KZ) • Korea, Republic of (KR) • Malaysia (MY) (and SRI Taxonomy) • Mexico (MX) • Mongolia (MN) • Papua New Guinea (PG) • Russian Federation (RU) • South Africa (SA) • Sri Lanka (LK) • Thailand (TH)
Under development	Australia (AU) • Brazil (BR) • Canada (CA) • Chile (CL) • Costa Rica (CR) • Dominican Republic (DO) • Hong Kong SAR, China (HK) • India (IN) • Kyrgyz Republic (KG) • Panama (PA) • Peru (PE) • Philippines (PH) • Rwanda (RW) • Senegal (SN) • Singapore (SG) • United Arab Emirates (AE) • United Kingdom (UK) • Vietnam (VN)
Under consideration/discussion	Ecuador (EC) • Egypt, Arab Rep. (EG) • Japan (JP) • New Zealand (NZ) • Türkiye (TR)

Regional Initiatives in place:

Association of Southeast Asian Nations (ASEAN) Taxonomy⁹⁸ • International Platform on Sustainable Finance Common Ground Taxonomy⁹⁹ • Working Group on Sustainable Finance Taxonomies in Latin America and the Caribbean¹⁰⁰ • Central America Sustainable Banking Initiative¹⁰¹

The analysis also incorporated private and nongovernmental initiatives, including

The Climate Bonds Initiative Taxonomy, the SBTi framework, and private examples of taxonomies (such as by commercial banks, ICMA Green Bond Principles and Climate Transition Finance Handbook, and so on).

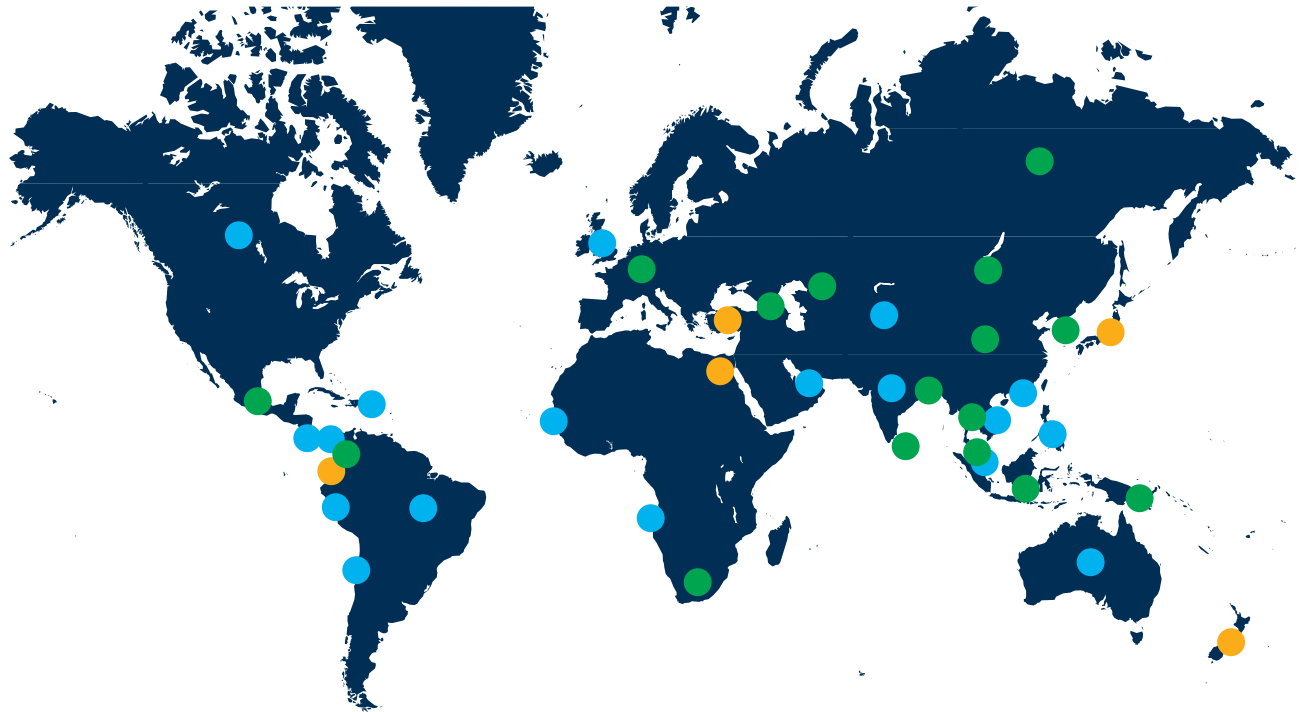
98 Association of Southeast Asian Nations (ASEAN), “Taxonomy for Sustainable Finance, version 2” (updated June 2023), AT V2 Main Rpt Draft_08Jun23_1700BKK (asean.org).

99 International Platform on Sustainable Finance (IPSF), “Common Ground Taxonomy—Climate Change Mitigation,” Instruction Report, June 2022, https://finance.ec.europa.eu/system/files/2022-06/220603-international-platform-sustainable-finance-common-ground-taxonomy-instruction-report_en.pdf. Common Ground Taxonomy Instruction Report – updated (europa.eu).

100 United Nations Environment Programme Finance Initiative (UNEPFI), “Common Framework for Sustainable Finance Taxonomies for Latin America and the Caribbean”, June 2023, <https://www.unepfi.org/publications/common-framework-for-sustainable-finance-taxonomies-for-latin-america-and-the-caribbean/>. Common Framework for Sustainable Finance Taxonomies for Latin America and the Caribbean – United Nations Environment – Finance Initiative (unepfi.org).

101 See disclosures.ifc.org.

Figure B.2: Global Landscape of Taxonomies, per status of implementation



In place

Bangladesh (BD)
 China (CN)
 Colombia (CO)
 European Union (EU) (27 member states)
 Georgia (GE)
 Indonesia (ID)
 Kazakhstan (KZ)
 Korea, Republic of (KR)
 Malaysia (MY) (and SRI Taxonomy)
 Mexico (MX)
 Mongolia (MN)
 Papua New Guinea (PG)
 Russian Federation (RU)
 South Africa (SA)
 Sri Lanka (LK)
 Thailand (TH)



Under development

Australia (AU)
 Brazil (BR)
 Canada (CA)
 Chile (CL)
 Costa Rica (CR)
 Dominican Republic (DO)
 Hong Kong SAR, China (HK)
 India (IN)
 Kyrgyz Republic (KG)
 Panama (PA)
 Peru (PE)
 Philippines (PH)
 Rwanda (RW)
 Senegal (SN)
 Singapore (SG)
 United Arab Emirates (AE)
 United Kingdom (UK)
 Vietnam (VN)



Under consideration/ discussion

Ecuador (EC)
 Egypt, Arab Rep. (EG)
 Japan (JP)
 New Zealand (NZ)
 Türkiye (TR)

Source: Original figure for this publication.

Glossary

In the context of this paper, the following terms are used as per the following definitions. Some definitions are adapted from the ICMA Sustainable Finance High-Level Definitions and from the glossary of the IPCC Special Report 1.5°C (2018).

Abatement	Measures that companies take to prevent, reduce, or eliminate sources of GHG emissions within their value chain. Examples include reducing energy use, switching to renewable energy, and retiring high-emitting assets. Another similar term is <i>decarbonization</i> .
Adaptation	In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.
Alignment approaches	National, regional, and international policy frameworks for the financial sector that aim to monitor and ensure global sustainable finance flows are contributing to the goals of the Paris Agreement and the Sustainable Development Goals.
Alignment tools	Tools that support the implementation of alignment approaches. They include but are not limited to taxonomies, transition planning frameworks, labels, certifications, indexes, emission measurement methodologies for financial activities, and Paris- and/or SDG-aligned disclosure requirements.
Carbon credits	Units that are generated through voluntarily implemented emission reduction activities. Carbon credits can represent emission reductions achieved through either avoidance, for instance by capturing methane from landfills, or by removal from the atmosphere, such as sequestering carbon through afforestation or directly capturing carbon from the air and storing it. Each carbon credit represents 1 metric ton of carbon dioxide equivalent (tCO ₂ e) reduced or removed.
Carbon markets	A mechanism that allows countries or companies to buy and sell carbon credits. They include both compliance (created under a national, regional, or international policy or regulatory requirement) or voluntary.
Carbon sinks	A reservoir (natural or human, in soil, ocean, and plants) where a GHG, an aerosol, or a precursor of a GHG is stored.
Certifications	A system of checking that entities, products, or services have met certain standards or definitions.
Climate finance	Financing that supports the transition to a climate-resilient economy by enabling mitigation actions to reduce and contain greenhouse gas emissions and adaptation actions that promote the climate resilience of infrastructure as well as social and economic assets.
Climate transition	A pathway supported by plans, policies, targets, milestones, and initiatives to achieve a climate-resilient economy with low greenhouse gas emissions in line with the goals of the Paris Agreement. Article 2.1 (c) of the Paris Agreement refers to “making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.”
Decarbonization	The process by which countries, individuals, or other entities aim to achieve zero fossil carbon existence. This typically refers to a reduction of the carbon emissions associated with electricity, industry, and transport.
Decoupling	Decoupling (in relation to climate change) is where economic growth is no longer strongly associated with consumption of fossil fuels. Relative decoupling is where both grow but at different rates. Absolute decoupling is where economic growth happens but fossil fuels decline.
Do No Significant Harm	A requirement in the context of sustainable finance policy that, while a financed activity, asset, or entity makes a significant contribution to certain environmental or social objectives, it should not at the same time do significant harm to other environmental or social objectives, thereby negating or diminishing the overall environmental and social benefit of the activity, asset, or entity.
Double materiality	A disclosure is material if it is material from an “impact” perspective (that is, affects employees, customers, vendors, or the environment), a financial perspective (that is, investors or creditors), or a combination of both.

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ESG disclosure	Mandatory or voluntary disclosure by private and/or public sector entities—with reference to international or national regulations, standards, or frameworks—on their approach and results in managing ESG performance and impacts.
ESG investing	Strategies and practices that incorporate material ESG factors in investment decisions and active ownership with a view to minimize risks and maximize returns. It can be pursued by all investors as part of their fiduciary duty on the basis that ESG factors are considered as having a material impact on returns.
ESG index	An index of companies, sovereigns, or supranationals that meet certain criteria for environmental, social, and governance performance. In the case of alignment with the Paris Agreement goals, the constituent entities may need to demonstrate adherence to certain criteria or performance thresholds for climate change mitigation and reduction of greenhouse gas emissions.
ESG standards	Voluntary or mandatory performance standards for managing the environmental, social, and governance performance of an activity, asset, or entity. ESG standards can be used to manage risk in financed activities, assets, and entities. They may link to disclosure requirements.
Financial inclusion	The availability and equality of opportunities to access financial services. It refers to a process by which individuals and businesses can access appropriate, affordable, and timely financial products and services. These include banking, loan, equity, and insurance products.
Green finance	Finance that addresses environmental objectives, such as climate change mitigation and adaptation, natural resource conservation, biodiversity conservation, and pollution prevention and control.
Green, Social, and Sustainability (GSS) Bond	Fixed-income financial instruments, from which proceeds are used to finance or re-finance a combination of green and social projects or activities with the aim of addressing environmental and social challenges, including climate change.
Impact finance	Financing of businesses or economic activities which produces verifiable and direct positive impact on the society and/or environment, based on agreed metrics and benchmarking, while also seeking market-aligned or better financial returns.
Inclusive green finance	Access to and usage of financial services and products that build resilience to the negative impacts of climate change, loss of biodiversity, and ecosystems, and that facilitate participation of low-income households, small businesses, and vulnerable groups in the green and low-carbon economy.
Just Transition	A framework initially developed by the trade union movement that encompasses a range of social interventions needed to secure workers' rights and livelihoods and minimize negative social impacts, particularly on vulnerable communities, when economies are shifting to address environmental challenges, such as climate change. In the context of climate change, a just transition may seek to ensure that the substantial benefits of a low-carbon transition are shared widely while also supporting those who stand to lose economically.
Label	An official symbol that shows that a product meets certain criteria. For instance, an environmental label indicates that a product has been designed to do less harm to the environment than similar products. Environmental or social labels are a means of measuring performance and also communicating and marketing the sustainability credentials of a given product.
Lock-in	A situation in which the future development of a system, including infrastructure, technologies, investments, institutions, and behavioral norms, is determined or constrained ("locked in") by historic developments.
Low-carbon	Causing or resulting in only a relatively small net release of greenhouse gases (CO ₂ equivalent) into the atmosphere.
Minimum social safeguards	A requirement in the context of sustainable finance, and particularly taxonomy frameworks, whereby activities that seek to be identified as having environmental and social benefits and/or meeting sustainability criteria must, at a minimum, meet certain social and human rights criteria or standards.
Mitigation (of climate change)	A human intervention to reduce emissions or enhance the sinks of greenhouse gases.

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Net Zero	A state in which human-caused greenhouse gases going into the atmosphere are balanced by human-led removal out of the atmosphere, over a specified period and within specified boundaries. It is also used to describe targets and strategies adopted by governments, cities, and private sector entities to adhere to national emission-reduction pathways that are consistent with limiting the global temperature increase to 1.5°C above pre-industrial levels in line with the Paris Agreement.
Paris Agreement	A legally binding international treaty on climate change adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France, on December 12, 2015, with the overarching goal of holding “the increase in the global average temperature to well below 2°C above pre-industrial levels” and pursuing efforts “to limit the temperature increase to 1.5°C above pre-industrial levels.”
Pathway (or Emission pathway)	The temporal evolution of natural and/or human systems toward a future state. Pathway concepts range from sets of quantitative and qualitative scenarios or narratives of potential futures to solution-oriented decision-making processes to achieve desirable societal goals. Pathway approaches typically focus on biophysical, techno-economic, and/or sociobehavioral trajectories and involve various dynamics, goals, and actors across different scales.
Resilience	The capacity of social, economic, and environmental systems to cope with a hazardous event, trend, or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure while also maintaining the capacity for adaptation, learning, and transformation. This definition builds from the definition used by the Arctic Council (2013).
Scopes (of GHG emissions)	<p>Scope 1 Direct GHG emissions occur from sources that are owned or controlled by the company—for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, and so on, or emissions from chemical production in owned or controlled process equipment.</p> <p>Scope 2 Emissions from purchased electricity, heat, and steam for use in business operations. Scope 2 emissions physically occur at the facility where electricity is generated and so would fall into the Scope 1 category for the power generator.</p> <p>Scope 3 Scope 3 is a reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company but occur from sources not owned or controlled by the company—typically as a result of supplier or customer activities.</p> <p>These can be up or down the value chain—for example, transport and distribution—or the disposal of goods or services after they reach the consumer. Some examples of Scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of sold products and services.</p>
Sustainable Development Goals	The 17 goals that form the core of the 2030 Agenda for Sustainable Development, which were adopted by the United Nations on September 25, 2015, to end poverty, protect the planet, and ensure prosperity for all. Each goal has specific targets to be achieved by 2030, totaling 169 targets for all 17 goals. These goals and targets have been designed for consideration by national governments and are increasingly used by the private sector.
Sustainable finance	Practices by financial institutions and other financial sector participants that reduce and manage ESG risks resulting from or affecting financial sector activities, including climate change risks, and that encourage the flow of capital to assets, projects, sectors, and businesses that have environmental and social benefits, including climate change mitigation and adaptation.
Sustainable finance taxonomy	A classification system identifying activities, assets, and/or project categories that deliver on key environmental, social, or sustainable objectives and/or criteria with reference to identified thresholds and/or targets.
Sustainability-linked loan	Any type of loan instrument and/or contingent facility—such as bond line, guarantee line, or letter of credit—that incentivizes the borrower’s achievement of ambitious, predetermined sustainability performance objectives.
Transition frameworks	Principles, guidance, and/or methodologies that help the private sector to design and communicate a credible shift to low-carbon technologies and practices in line with the Paris Agreement goals.
Value chain GHG emissions	Can mean a company’s Scope 3 emissions (see <i>Scopes</i>). However, sometimes the term value chain is used more broadly and includes a company’s operational emissions (Scope 1 and Scope 2) as well as Scope 3.

Note: CO₂ = carbon dioxide; ESG = environmental, social, and governance; GHG = greenhouse gas; GSS = green, social, and sustainability; SDGs = Sustainable Development Goals.



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