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The puzzle of forward-looking climate transition risk metrics¹

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¹ This contribution was prepared for the workshop. The views expressed are those of the authors and do not necessarily reflect the views of the Central Bank of the Republic of Türkiye, the BIS, the IFC or the other central banks and institutions represented at the event.

The puzzle of forward-looking climate transition risk metrics (*)

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Abstract

With climate change effects becoming more evident every year, preventing and, ideally, reversing it is a pressing challenge. The Paris Agreement was a milestone in the fight against climate change, setting a series of specific targets for 2050. The agreement sets out a series of goals, including to hold the increase in the global temperature to below 2°C above pre-industrial levels and to pursue efforts to limit the increase to 1.5°C. Assessing the world's progress towards this goal requires forward-looking information on the transition to net-zero of companies, the financial sector, and countries alike.

In this paper, we begin by highlighting the importance of forward-looking indicators for assessing climate-related transition risks, both for corporations and countries. We then assess a range of currently available data sources. These data sources provide a variety of indicators, particularly for corporations. However, we find that results vary depending on the data sources used, and only a limited number of firms, primarily large ones, are currently disclosing forward-looking indicators. These discrepancies can partly be attributed to differences in methodology, they are not always easy to understand, nor are they always comparable or communicated transparently. Therefore, their appropriate use depends on specific use cases. We also analyse the goals and pathways established by countries to achieve the Paris Agreement's general target through different data sources and frameworks. We find that there are different approaches based on the original goals set by each country.

We close the paper by outlining potential ways forward for central banks, as well as how statisticians, standard setters, and other relevant stakeholders, including private entities, can help improve the quality, accessibility, and comparability of forward-looking transition risk data.

Key words: climate change, targets, forward-looking, indicators, transition plans

1. The importance of climate forward-looking metrics

The Paris Agreement was a milestone in the fight against climate change, setting a series of specific targets for 2050. The agreement sets out a series of goals, including to hold the increase in the global temperature to below 2°C above pre-industrial levels and to pursue efforts to limit the increase to 1.5°C. Assessing the world's progress towards this goal requires forward-looking information on the transition to net-zero of companies, the financial sector, and countries alike.

The Intergovernmental Panel on Climate Change (IPCC), established in 1988 to provide policymakers with regular scientific assessments on the current state of knowledge about climate change, shows in its Special Report on Global Warming of 1.5°C that pathways limiting global warming to 1.5°C with no or limited overshoot would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems (Finding C.2. in IPCC (2018)). In its assessment reports, the IPCC summarizes the state of knowledge on climate change, its widespread impacts and risks, and climate change mitigation and adaptation, serving as a reference for scenario building. The IPCC (2021) finds that unless there are immediate, rapid, and large-scale reductions in greenhouse gas emissions, limiting warming to close to 1.5°C or even 2°C will be beyond reach.

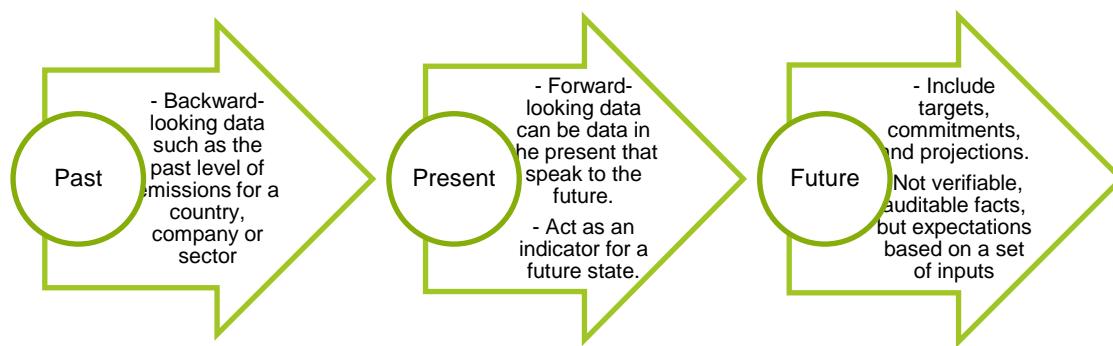
Achieving the long-term climate goals set in the Paris Agreement requires a transition process that impacts every sector of the economy, including finance, investment, and asset management. Collectively, individual goals will enable the ultimate global goal to be met. This necessitates detailed planning by both financial and non-financial corporations, outlining strategies that encompass climate and environmental risk management and sustainability factors. Such planning will make short, medium, and long-term business models more resilient in achieving global net-zero emissions¹. The United Nations (2022) emphasizes that while governments must lead in reducing emissions, action by non-state actors is also crucial in this process.

To assess progress towards achieving these targets, it is necessary to combine the establishment of intermediate targets with final targets. This process forms an integral part of developing transition plans. The parameters of this process are based on the need for both backward-looking and forward-looking data and metrics. The former helps understand past trends and serves as the starting point for the latter, which focuses on the future.

¹ Net zero is defined by United Nations (2022) as a state by which the greenhouse gases going into the atmosphere are reduced as close to zero as possible and any residual emissions are balanced by permanent removals from the atmosphere by 2050.

In 2021, a report by the Future of Sustainable Data Alliance (FoSDA) showed that data for sustainability can be broadly categorized into past, present, and future data. Past data refers to backward-looking data, such as the historical level of emissions for a company or sector. Forward-looking data can be present data that indicate future trends, acting as indicators for a future state. Future data include targets, commitments, and projections. They differ in that they are not verifiable, auditable facts, but rather expectations based on a set of inputs².

Infographic 1. Sustainability Data according to time-horizon



Source: own elaboration based on FoSDA (2021).

According to FoSDA (2021), forward-looking data fulfils three key uses:

- They enable investors to differentiate between companies with different potentials in terms of their sustainability outlook.
- They enable investors to assess the company's adaptive performance.
- They are crucial for benchmarking against scenarios.

As is often the case when working with climate related data, users of climate risk metrics should properly understand the key assumptions underlying a metric to appropriately interpret its result³. This is especially important when working with forward-looking data related to net zero, which is a newer field of analysis⁴.

² FOSDA _ Forward looking data – Fosda Review 2021

<https://futureofsustainabledata.com/wp-content/uploads/2021/10/FoSDA-Forward-Looking-Data-report-1.pdf>

³ See: Understand what you measure: Where climate transition risk metrics converge and why they diverge.

<https://www.sciencedirect.com/science/article/pii/S1544612322004561>

⁴ See United Nations (2022)

In this paper, we begin by highlighting the relevance of forward-looking indicators for assessing climate-related transition risks in Section 2, focusing on both countries and corporations. We gather several key elements or pieces that are relevant for designing targets and forward-looking methodologies. Specifically, we take a closer look at the case of countries in Section 3 and corporates in Section 4, assessing a series of currently available data. We close the paper by outlining potential ways forward for central banks, as well as how statisticians, standard setters, and other relevant stakeholders, including private entities, can help improve the quality, accessibility, and comparability of forward-looking transition risk data.

2. From backward-looking to forward-looking climate metrics.

Assessing global progress towards the Paris Agreement goals involves setting targets and designing a pathway to achieve net zero emissions. This process must be supported by the development of comprehensive and feasible transition plans that outline how to meet these targets. To establish medium and long-term objectives, it is essential to develop transition plans and forward-looking indicators.

According to the European Environmental Agency (2008): “well designed and sound forward-looking assessments and scenario-based approaches can effectively support different phases of the policy cycle. They can, for example, support policy making by providing a platform for reflecting on different options for the future, for identifying uncertainties, for framing policies by identifying priority and emerging issues, for checking whether and how targets can be met, for developing robust measures and precautionary actions, for analysing cause-effect relationships, for anticipating possible surprises, and for facilitating short and long-term thinking in a structured way.”

In this context, drawing up transition plans is one way of setting decarbonisation goals, and of designing the process to meet them. A 2022 OECD report highlights that the “adoption of credible transition plans by corporations can facilitate the financing of decarbonisation actions by providing financial market participants with confidence in the corporation’s commitment to decarbonise.”⁵

⁵ See OECD (2022).

The Task Force on Climate-related Financial Disclosures (TCFD)⁶ included the preparation of transition plans among its voluntary recommendations for disclosing climate-related risks and opportunities. Similarly, both the European Financial Reporting Advisory Group (EFRAG) and the International Sustainability Standards Board (ISSB) have incorporated this element into their standards. Currently, transition plans are in the development stage within the corporate and financial sectors. According to a 2023 report from the Carbon Disclosure Project (CDP)⁷, over 4,000 firms (out of 18,600 analysed) had a climate transition plan. However, when drawing up their plans, only 81 of these firms (0.4%) included all 21 of the CDP's indicators in their plans.

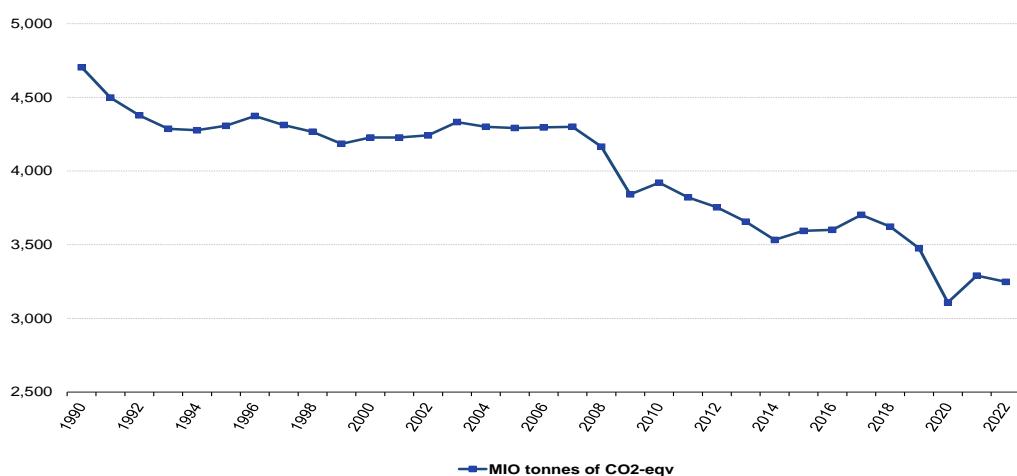
For assessing climate-related transition risks from both countries and corporations, forward-looking indicators are essential tools for setting targets. As more countries, firms, and financial institutions publicly commit to achieving climate goals, forward-looking metrics become increasingly important. These metrics are a useful to ensure that the goals and pathways set are credible and comparable. Various methodologies are currently being developed by data providers and institutions, both public and private. However, compared to backward-looking metrics, this is an area where greater expertise is still needed. Setting and meeting net-zero targets requires the use of different metrics that combine a forward-looking approach with long-term goals.

So far, most analyses have been carried out using historical records, such as examining how GHG emissions have evolved over time. The main indicator for analysing the past is Greenhouse Gas (GHG) emissions. When we look at historical data, we see that in the European Union (EU), for instance, GHG emissions in 2021 were down by 30% compared to 1990 levels, representing an absolute reduction of 1,401 million tonnes of CO2-equivalents (see graph 1).

⁶ The TCFD was set up in late 2015 by the Financial Stability Board (FSB), at the request of the G20, and is made up of representatives from the private sector. It was charged with drawing up a set of voluntary recommendations for the comparable disclosure of information on climate change-related financial risks and opportunities. Specifically, these recommendations refer to four areas: i) governance, ii) strategy, iii) risk management, and iv) metrics and targets.

⁷ CDP (2023).

Graph 1: Historical greenhouse gas emissions in the European Union- 1990-2022⁸



Source: European Environment Agency (online data code: env_air_gge) (Net greenhouse gas emissions (including international aviation, including Land Use, Land-Use Change, and Forestry (LULUCF)))

According to the GHG protocol, there are three types of emissions: Scope 1 (direct), Scope 2 (indirect from the generation of purchased electricity), and Scope 3 (all other indirect). These categories provide a foundation for businesses to measure, plan, and track progress toward science-based and net-zero targets in line with the global 1.5°C goal.

The EU has set targets for reducing its greenhouse gas emissions progressively. By 2050, Europe aims to become the world's first climate-neutral continent (see graph 2 and section 3). To achieve this, the EU has established two intermediate goals:

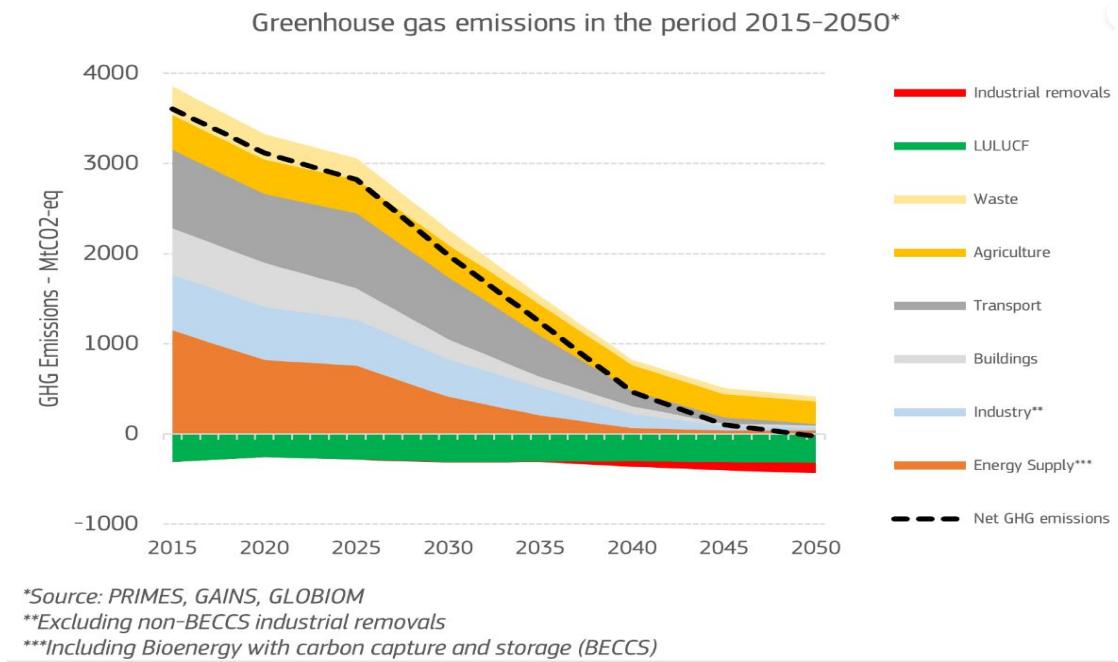
- In 2023, the EU adopted a set of Commission proposals to align its climate, energy, transport, and taxation policies with the goal of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels⁹.
- In February 2024, the European Commission presented its assessment for a 2040 climate target for the EU, recommending a reduction of the EU's net greenhouse gas emissions by 90% by 2040 relative to 1990.¹⁰

⁸ Source: Greenhouse gas emission statistics - emission inventories - Statistics Explained (europa.eu); Greenhouse gas emission statistics - emission inventories - Statistics Explained (europa.eu)

⁹ https://climate.ec.europa.eu/eu-action/climate-strategies-targets/2030-climate-targets_en

¹⁰ https://climate.ec.europa.eu/eu-action/climate-strategies-targets/2040-climate-target_en

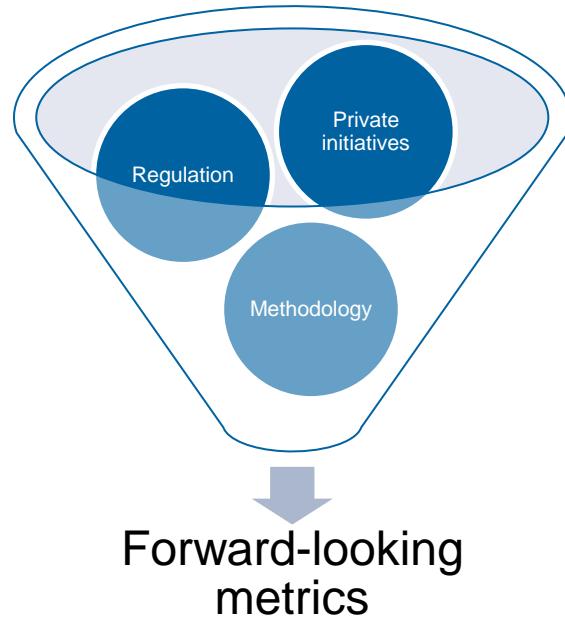
Graph 2: Climate targets in the European Union by sector



Source: 2040 climate target - European Commission (europa.eu)

To achieve these collective targets, several pieces of the puzzle are developing simultaneously. On one hand, the EU has approved various regulations related to the creation and disclosure of transition plans. Additionally, private initiatives are designing sector-specific plans and targets, while providers are developing methodologies for forward-looking metrics and indicators (see infographic 2).

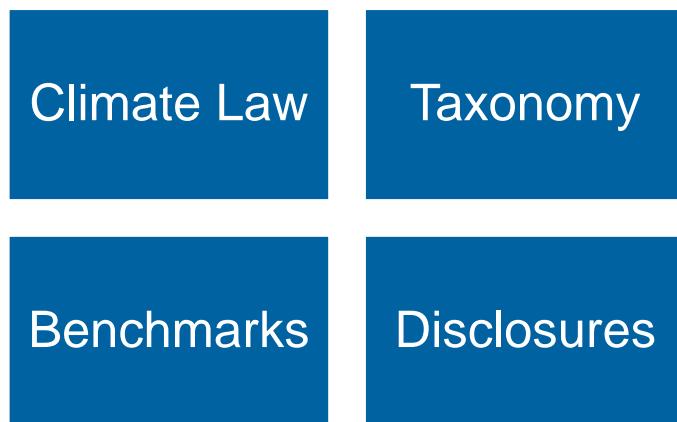
Infographic 2: Ingredients for the development of forward-looking metrics



2.1 Regulation

In recent years, several **pieces of regulations** (see infographic 3) have been approved in Europe as part of the Sustainable Finance Plan, aiming to align financial flows with the goal of achieving the 1.5°C target set by the Paris Agreement.

Infographic 3: Pieces of Climate Regulation in the EU:



Some of these regulations focus on this alignment, while others require the development of transition plans, including:

a. EU Climate Law.

The European Climate Law¹¹ writes into law the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. It also sets an intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. Achieving climate neutrality by 2050 means reaching net zero greenhouse gas emissions for EU countries as a whole. The law aims to ensure that all EU policies contribute to this goal and that all sectors of the economy and society play their part.

Progress is reviewed every five years, in line with the global stocktake exercise under the Paris Agreement. In 2023, for the first time, the Commission assessed progress towards the climate neutrality and adaptation objectives, as required under the European Climate Law. The findings were published as part of the Climate Action Progress Report¹² and in a separate document on national progress. Based on the assessment, the Commission issued recommendations to Member States under the European Climate Law in December 2023¹³.

b. Taxonomy alignment

To advance reliable and comparable climate-related data, the action plan on financing sustainable growth called for the creation of a common classification system for sustainable economic activities, known as the "EU taxonomy." The EU taxonomy aims to improve market transparency and is designed to help direct investments to the economic activities most needed for the transition. It is a classification system that defines criteria for economic activities aligned with a net zero trajectory by 2050 and broader environmental goals beyond climate¹⁴. The EU taxonomy is currently being implemented. The Platform on Sustainable Finance¹⁵, an advisory board of the European Commission, published a report on a compendium of market practices. This report demonstrates that the EU taxonomy is

¹¹ European Climate Law - European Commission (europa.eu)

¹² Progress made in cutting emissions - European Commission (europa.eu)

¹³ National energy and climate plans (europa.eu)

¹⁴ https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en

¹⁵ Platform on Sustainable Finance - European Commission (europa.eu)

being used for setting transition strategies, structuring financial transactions, and reporting on sustainability efforts, among other tools¹⁶.

c. EU Climate Benchmarks – i) EU climate transition benchmark and ii) EU Paris-aligned benchmark.

In 2019, the European Commission announced the creation of two new benchmark categories or labels that consider the carbon footprint of the underlying assets (climate benchmarks)¹⁷. A climate benchmark is defined as an investment benchmark that incorporates specific objectives related to greenhouse gas (GHG) emission reductions and the transition to a low-carbon economy through the selection and weighting of underlying constituents¹⁸. The methodologies for the EU climate benchmarks, "EU Climate Transition" and "EU Paris-aligned," are based on the commitments outlined in the Paris Agreement. Both benchmarks pursue similar objectives but differ in their level of ambition¹⁹.

d. Disclosure – Directive on corporate sustainability reporting (CSRD).

Last but not least, disclosure requirements are a crucial cornerstone in the establishment of transition plans. In the European Union, the Corporate Sustainability Reporting Directive (CSRD)²⁰ states that a large number of companies will need to disclose a transition plan aligned with the 1.5°C limit. The CSRD requires companies to disclose: (1) climate targets for all three scopes of carbon emissions, (2) whether these targets are compatible with the 1.5°C temperature increase limit, and (3) and how scenarios are used to construct these targets. Under the CSRD, companies must disclose near- and long-term targets every five years between 2030 and 2050, expressed in absolute values, to ensure the rapid decarbonization of economic activities. Additionally, it is considered that this information should be reported in a single electronic format to create a European Single Access Point (ESAP) for public corporate information.

¹⁶ See Platform on Sustainable Finance (2024).

¹⁷ <https://cnmv.es/portal/Benchmark/Indice-Climatico.aspx?lang=en>

¹⁸ https://www.unepfi.org/wordpress/wp-content/uploads/2022/02/Climate-Benchmarks_all-members-presentation.pdf

¹⁹ https://finance.ec.europa.eu/regulation-and-supervision/financial-services-legislation/implementing-and-delegated-acts/eu-climate-transition-benchmarks-regulation_en

²⁰ Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting (Text with EEA relevance) . https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

2.2. Private initiatives

At the same time, the private sector has been working on various **initiatives that set sector-specific targets**. For example:

- Race to Zero – A coalition of non-state actors with the goal of halving global emissions by 2030²¹. All members must meet robust, science-aligned criteria. Since June 2020, over 13,000 members have joined the campaign, committing to the same goal: reducing emissions across all scopes in line with the Paris Agreement, with transparent action plans and robust near-term targets.
- UN-convened Net-Zero Asset Owner Alliance: Established in 2019, this alliance consists of asset owners committed to achieving net-zero emissions neutrality in their investment portfolios by 2050, consistent with a maximum temperature rise of 1.5°C²². The pathway includes interim reduction targets ranging from 22% to 32% by 2025 and from 40% to 60% by 2030.
- Net Zero Asset Managers Initiative: Launched in 2020, this initiative has over 300 signatories committed to supporting investments aligned with net zero emissions by 2050. They set decarbonisation targets for 2030 for Scope 1 and 2 emissions and, to the extent possible, Scope 3 emissions. This initiative is a formal partner of the UNFCCC's Race to Zero Campaign.
- Paris Aligned Asset Owners Initiative: Established in 2019 by the Institutional Investors Group on Climate Change²³. In 2021, it became a global initiative in collaboration with similar investor networks in Asia, North America, and Australasia. Its objective is to provide a basis for investors to commit to achieving global net zero emissions by 2050, in line with the Paris Agreement.
- Net Zero Banking Alliance: A sector-specific alliance for banks under the Glasgow Financial Alliance for Net Zero²⁴. This industry-led and UN-convened initiative is formed by global banks committed to financing ambitious climate action to transition the real economy to net-zero greenhouse gas emissions by 2050.
- Glasgow Financial Alliance for Net Zero (GFANZ): Launched in April 2021, GFANZ is a global coalition of leading financial institutions committed to accelerating the decarbonization of the economy²⁵. GFANZ has developed tools and methodologies to support financial institutions' net-zero commitments and includes eight sector-

²¹ <https://racetozero.unfccc.int/system/race-to-zero/>

²² <https://www.unepfi.org/net-zero-alliance/>

²³ <https://www.parisalignedassetowners.org/>

²⁴ <https://www.unepfi.org/net-zero-banking/>

²⁵ Glasgow Financial Alliance for Net Zero (gfanzero.com)

specific alliances: Net-Zero Asset Owner Alliance, Net-Zero Asset Managers Initiative, Paris Aligned Asset Owners, Net-Zero Banking Alliance, Net-Zero Insurance Alliance, Net Zero Financial Service Providers Alliance, Net Zero Investment Consultants Initiative, and The Venture Climate Alliance.

2.3. Forward looking indicators

Regarding **forward-looking indicators**, several methodologies have been developed. It is important to note that different methodologies apply to physical climate change risks and transition risks.

For **physical risk**, Fehr, Triebeskorn, and Mehrhoff (2022) compared data from third-party providers to extract relevant aggregates at the sector and country levels²⁶. The forward-looking metrics refer to physical risk in 2050, depending on various Representative Concentration Pathways (RCPs) that represent different levels of global warming, as defined by the Intergovernmental Panel on Climate Change (IPCC). They encountered the following issues:

- Limited coverage of company-level data.
- The variation between the different data providers is high, similar to other areas of sustainability data.
- The hazards covered, as well as their definitions, are not consistent across data providers and therefore need to be considered when analysing results.
- Physical risk metrics should be comparable across years and scenarios and reflect financial damages.

In the case of **transition risks**, which is the focus of this article, there are several frameworks and metrics. Various initiatives are underway, detailed in the next two sections—one dedicated to countries and the other to corporations. We will see that, depending on the use case and data needs, the appropriate sources and methodologies will differ.

As outlined in a 2024 OECD Review on aligning finance with climate goals (OECD, 2024), climate-alignment assessments require methodological transparency and different methodological assumptions, such as the choice of reference scenario, can lead to diverging results. In this respect, relying on a robust set of complementary metrics

²⁶ [Constructing forward-looking climate-related physical risk indicators \(bis.org\)](https://www.bis.org/research/constructing-forward-looking-climate-related-physical-risk-indicators.html)

provides a more complete and accurate view of progress towards transition plans and alignment.

Therefore, an important **additional piece of the puzzle** is that the development of methodologies and goals must be based on **scenarios**, primarily the IPCC scenarios. Additionally, the Network for Greening the Financial System (NGFS) has developed several scenarios based on the IPCC. Scenario analysis is a key part of the toolbox for central banks and other international financial institutions²⁷. By nature, scenarios are forward-looking, making forward-looking data a critical ingredient for their use. The NGFS published its climate scenarios portal²⁸, highlighting six scenarios to assess transition and physical risks, ranging from the 'delayed transition' and 'current policies' bad outcomes to 'below 2 degrees' or even more ambitious 'net zero 2050' scenarios.

As we have seen, targets can be set at different levels of aggregation: countries, economic sectors, companies, or portfolios, to name a few. Ideally, targets at the disaggregated level should collectively contribute to the implementation of emission reduction targets for a country as a whole. In the next section, we will examine various sources of data at distinct levels of aggregation and compare these results.

3. Puzzle pieces in the case of countries.

Under the Paris Agreement, countries commit to achieving their ultimate goals through the establishment of their NDCs, which involves setting long-term goals and measures to reach them. The main metric to evaluate the alignment with the Paris Agreement is the evolution of total GHG emissions and the compliance with the interim goals set in order to achieve the long-term objectives in 2050. In the case of sovereigns there is no standard method to perform this analysis and the forward-looking methodologies and metrics are under development. Currently we can find several initiatives that are under development such as Net Zero Tracker, ASCOR Project or Climate Action Tracker that collects information on the type of commitment of countries and assess the state of play of their achievement.

²⁷ <https://futureofsustainabledata.com/wp-content/uploads/2021/10/FoSDA-Forward-Looking-Data-report-1.pdf>

²⁸ [NGFS Scenarios Portal](#)

3.1. Paris Agreement, NDCs targets and national plans

The main goal of the Paris Agreement is to prevent global temperatures from rising by more than 2 degrees Celsius (2°C) above pre-industrial levels, while striving to limit this increase to 1.5°C. Additionally, it sets two further objectives: enhancing the economy's capacity to adapt to the adverse effects of climate change and reducing greenhouse gas emissions; and promoting the financing of investments needed to support sustainable growth.

The Paris Agreement was adopted in 2015 at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Paris. This agreement was signed by 195 out of 198 Parties to the United Nations Framework Convention on Climate Change. Each Party to the Paris Agreement is required to establish a Nationally Determined Contribution (NDC). The NDCs contain information on targets, policies, and measures for reducing national emissions and adapting to climate change impacts. They also include details on the needs for, or provision of, finance, technologies, and capacity building for these actions. Countries communicate new or updated NDCs every five years, starting in 2020.

Countries establish their NDCs by setting targets for mitigating the greenhouse gas emissions that cause climate change and for adapting to climate impacts. The plans define how to reach the targets and how to monitor and verify progress. Some countries also link their NDCs to national development plans, including those aimed at achieving the Sustainable Development Goals²⁹. Currently, some Parties have issued at least a first NDC, and some have communicated an update; however, ambitions vary. Some countries, due to their economic, technological, or developmental circumstances, may not be in a position to commit to the strictest target and, therefore, are allowed to follow a less ambitious goal.³⁰

In the case of mitigation targets, they range from economy-wide absolute emission reduction targets to strategies, policies, plans, and actions for low-emission development. According to

²⁹ See more in <https://www.un.org/en/climatechange/all-about-ndcs>

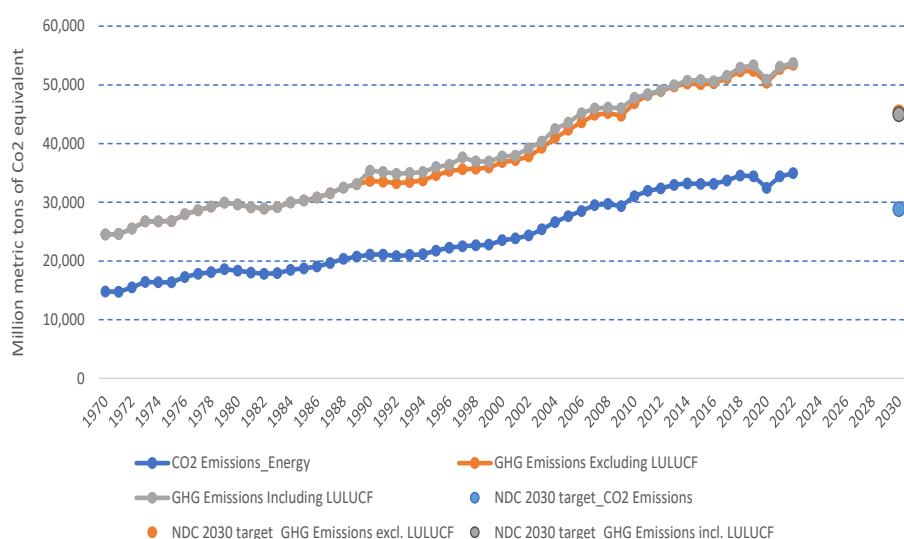
³⁰ Countries under the Paris Agreement are classified into different groups based on their commitments, as outlined in Annex I and Annex II of the United Nations Framework Convention on Climate Change (UNFCCC). Annex I Parties include industrialized countries that were members of the Organisation for Economic Co-operation and Development (OECD) in 1992, along with countries with economies in transition (EIT), such as the Russian Federation, the Baltic States, and several Central and Eastern European States. Annex II Parties are a subset of Annex I Parties, specifically the OECD members, excluding the EIT Parties. Non-Annex I Parties are mostly developing countries. The obligations are not the same in each group: i) Annex I Parties are required to adopt national policies and take measures to limit their greenhouse gas emissions. They are also expected to report regularly on their progress in reducing emissions, ii) Annex II Parties have additional responsibilities to provide financial resources to developing countries to help them undertake emissions reduction activities and adapt to the adverse effects of climate change. They are also required to promote the development and transfer of environmentally friendly technologies to both EIT Parties and developing countries, iii) Non-Annex I Parties are encouraged to implement national measures to mitigate climate change and adapt to its impacts. They receive support from Annex II Parties in the form of finance, technology, and capacity-building. See <https://unfccc.int/parties-observers>.

the “2023 NDC Synthesis Report” prepared by the United Nations and based on the NDC registry as of 25 September 2023:

- 94% of Parties provided quantified mitigation targets, expressed as clear numerical targets, while 6% included strategies, policies, plans, and actions for which there is no quantifiable information as components of their NDCs.
- 80% of Parties communicated economy-wide targets, covering all or almost all sectors defined in the 2006 IPCC Guidelines, with an increasing number of Parties moving to absolute emission reduction targets in their new or updated NDCs.
- A total of 93% of Parties communicated an NDC implementation period until 2030, while 7% specified an implementation period until 2025, 2035, 2040, or 2050.

The main metric that serves as the starting point for the analysis is the total Greenhouse Gas (GHG) emissions. It is a backward-looking metric because it reflects past data. As shown in Graph 3, the evolution of reported GHG emissions for the World should exhibit a decreasing trend to comply with the NDC targets for 2030 globally. There has been an increasing trend since 1990, particularly in recent years, despite the temporary decrease in total emissions in 2020 due to COVID-19. This is observed in both GHG emissions, including and excluding Land-Use and Land-Use Change and Forestry (LULUCF) emissions (in gray and orange, respectively), as well as in CO₂ emissions from the energy sector (in blue). The NDC targets for the three series in 2030 are well below the values recorded in 2022.

Graph 3. Reported Emissions vs NDCs targets. World



Source: IMF - Climate Change Dashboard.

In Europe, the European Climate Law, part of the European Green Deal announced in 2019, aims to make the economy and society climate-neutral by 2050. This means achieving net zero GHG emissions for EU countries as a whole, primarily by cutting emissions, investing in green technologies, and protecting the natural environment. The law also sets an intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. Additionally, since February 2024, the European Commission recommends a 90% net greenhouse gas emissions reduction by 2040 compared to 1990 levels. This target is aligned with the ambition to achieve climate neutrality by 2050.

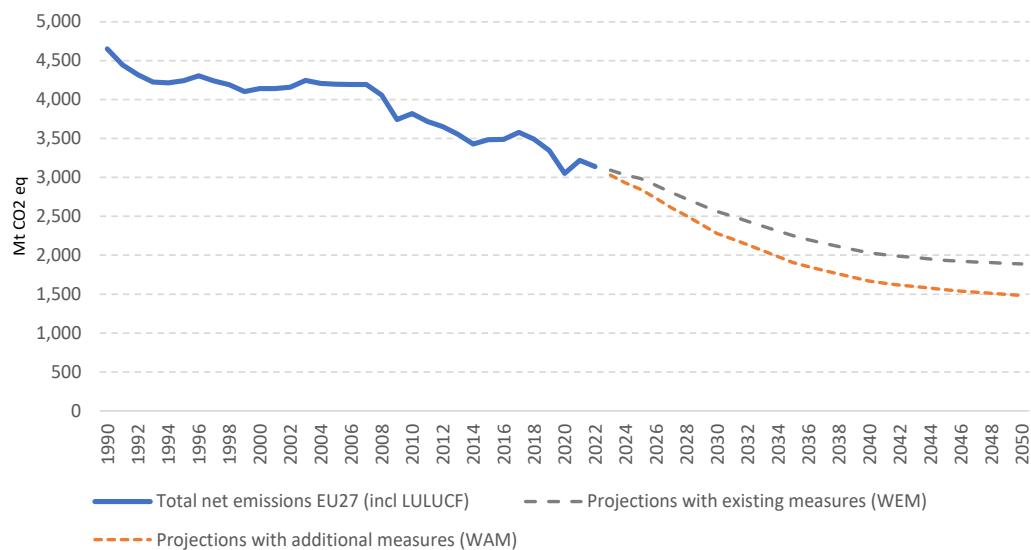
Each EU Member State must develop national long-term strategies on how they plan to achieve the greenhouse gas emissions reductions needed to meet their NDC commitments under the Paris Agreement and the EU's climate neutrality objective. According to the Regulation on the governance of the energy union and climate action (EU) 2018/1999, Member States had to design their draft National Energy and Climate Plans^{[31](#)} for the period 2021-2030 and submit an updated plan in 2023. The EU-wide assessment of 21 plans by the European Commission^{[32](#)} concludes that Member States are on the right track, but ambition gaps remain to achieve the recently agreed increased targets and objectives for 2030 in climate and energy policies.

Graph 4 illustrates the historical and projected GHG emissions (including LULUCF) for the European Union 27 up to 2050. There are two projection scenarios: (a) with existing measures (WEM), which reflect current policies and measures, and (b) with additional measures (WAM), which include further policies and measures that Member States plan to implement in the coming years. Under the WAM scenario, emissions would be lower than in the WEM scenario and compared to 1990 levels, emissions would be 51% lower in 2030 and 68% lower in 2050. The LULUCF sector plays a key role in achieving the European Union's goal of zero net emissions by 2050, for example these activities removed net 236 million tonnes of CO₂ equivalent (MtCO₂e) from the atmosphere in 2022, equal to 7% of the EU's annual greenhouse gas emissions. The goal of neutrality in 2050 depends on reducing greenhouse gas emissions but also on increasing CO₂ removals from the atmosphere. Among the EU Member States, Romania, Sweden, Spain, Italy, Poland, and France were responsible for the largest cumulative net removals from the LULUCF sector in the past 10 years.

^{[31](#)} [draft National energy and climate plans](#)

^{[32](#)} COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS EU wide assessment of the draft updated National Energy and Climate Plans An important step towards the more ambitious 2030 energy and climate objectives under the European Green Deal and RePowerEU. COM/2023/796 final

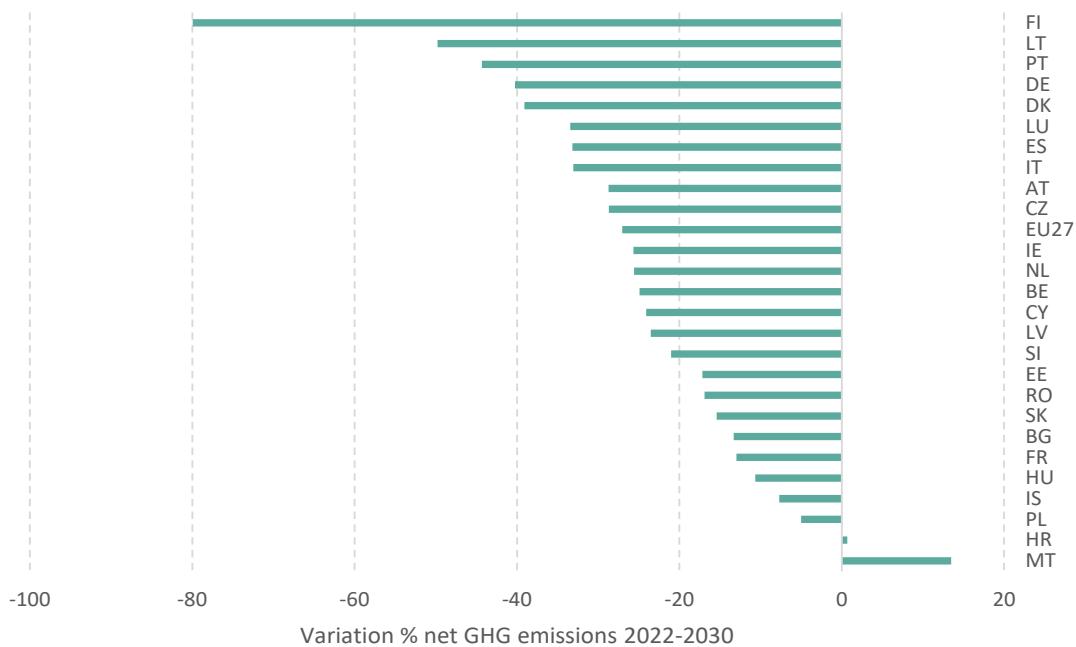
Graph 4. Historical and projected GHG net emissions (including LULUCF) - EU 27



Source: Own elaboration based on European Environment Agency data

EU Member States are required to report their GHG projections every 2 years (and optionally every year) under Article 18(1)(b) of the Governance of the Energy Union and Climate Action and under both WEM and WAM scenarios. Graph 5 shows the variation in GHG emissions (including LULUCF) between 2022 and 2030 that would be necessary in each country to achieve the targets set for 2030. As can be seen, most countries would need to achieve a reduction of over 20%, and in some cases, the reduction would need to exceed 40%.

Graph 5. Variation (%) in GHG Emissions (including LULUCF) 2022-2030 – With additional measures (WAM) by country



Source: Own elaboration based on European Environment Agency data

3.2. Net zero tracker

The Net Zero Tracker gathers information on sovereigns and corporations, focusing on the types of commitments and interim targets. It analyzes all nations that are parties to the UNFCCC, every region within the 25 largest emitting nations, all cities with over 500,000 inhabitants, and the world's 2,000 largest publicly listed companies by revenue. See Net Zero Tracker (2024a)³³.

Table 1 shows the types of commitments and the number of countries by geographical area. The majority of countries have set a “net zero” goal, followed by “carbon neutrality”. In Europe, there are almost the same number of countries under “net zero” and “emissions reduction target”, although some fall under “carbon neutrality” and “carbon neutral”. These types of commitments are established by law or policy documents in most European countries; however, in other regions, they are still under consideration, as shown in Graph 5. Regarding interim targets, according to data from the Net Zero Tracker, around 75% of countries have set an interim target, with 40% of those being an

³³ Details on the framework and data are available on the website <https://zerotracker.net/>

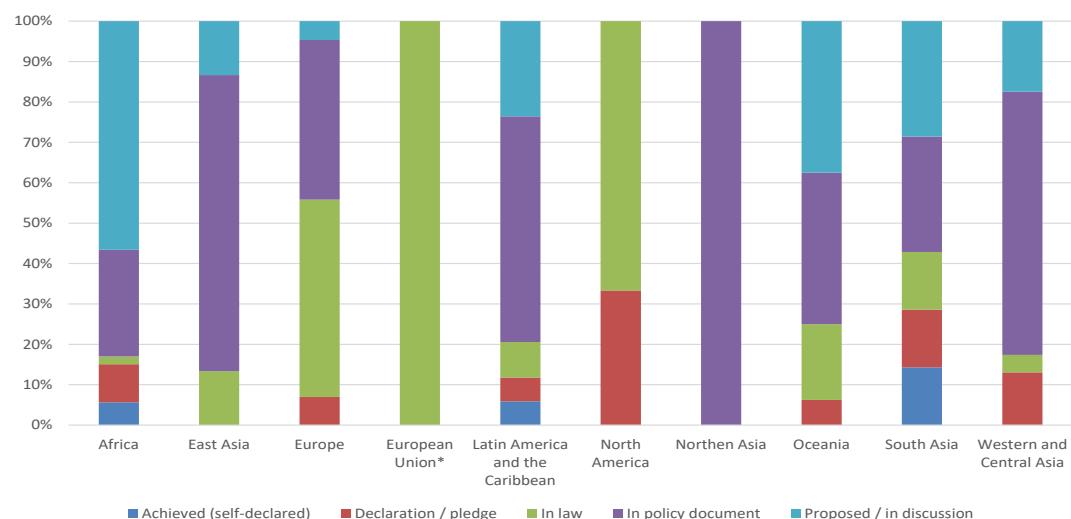
“emissions reduction” target.” According to Net Nero Tracker (2024a), many of the countries without net zero targets are low- or lower-middle income countries, which can justify longer timelines to achieve net zero emissions compared with other countries.

Table 1. Number of countries by type of compromise and geographical area

Area	Absolute emissions target	Carbon negative	Carbon neutral(ity)	Climate neutral	Emissions intensity target	Emissions reduction target	Net zero	No target	Other	Reduction v. BAU	Zero carbon	Zero emissions	Total
Africa		3				3	39	1	1	7			54
East Asia		3				2	8			2			15
Europe		8	9			13	12				1		44
European Union*					1								1
Latin America and the Caribbean		1	5			3	18	1	3	2	1		34
North America							2				1		3
Northern Asia			1										
Oceania							16						16
South Asia		1	1				5						7
Western and Central Asia		3	2	1		4	9	1	3	1			24
Total	1	1	24	12	1	25	109	3	7	13	1	1	198

Source: own elaboration based on Net Zero Tracker data. *European Union as a whole

Graph 6. Countries by end target status and geographical area



Source: own elaboration based on Net Zero Tracker data. *European Union as a whole

3.3. ASCOR Project

The project “Assessing Sovereign Climate-related Opportunities and Risks” (ASCOR) was created by a coalition of international investors and is led by asset owners, asset managers, and investor networks with the academic collaboration with the Transition Pathway Initiative Centre³⁴ to assess the climate action and alignment of sovereigns.

The framework is structured around several key pillars: the greenhouse gas emission pathways of a country and their alignment with global climate goals, the policies and measures implemented to mitigate climate change, the financial and economic policies that support or hinder climate action, and the social and governance aspects that influence a country's ability to manage climate risks and opportunities (see ASCOR, 2023).

The assessment relies on various indicators and metrics grouped into three pillars, as illustrated in Table 1. The goal is to evaluate the progress made by countries in managing the low-carbon transition and addressing the impacts of climate change.

Table 2. ASCOR Framework

Pillar 1. Emissions Pathways (EP)	Pillar 2. Climate Policies (CP)	Pillar 3. Climate Finance (CF)
EP 1. Emissions trends EP 2. 2030 targets EP 3. Net zero targets	CP 1. Climate legislation CP 2. Carbon pricing CP 3. Fossil fuels CP 4. Sectoral transitions CP 5. Adaptation CP 6. Just transition	CF 1. International climate finance CF 2. Transparency of climate costing CF 3. Transparency of climate spending CF 4. Renewable energy opportunities

Source: ASCOR (2023)

³⁴ The TPI Centre is part of the Grantham Research Institute on Climate Change and the Environment based at the London School of Economics and Political Science (LSE).

In 2024, ASCOR reviewed the climate change performance of 70 high-, middle-, and low-income countries³⁵ through its framework³⁶. Out of these, 40 countries have established a legal framework for national climate policy via a climate framework law³⁷. Focusing the analysis on Pillar 1, Emissions Pathways, it is divided into three blocks: (i) emissions trends, (ii) 2030 targets, and (iii) net zero targets, each containing various indicators and metrics.

Key findings regarding targets³⁸ are:

- 40 of the 70 countries have reduced their emissions over the past five years,
- 96% of the countries have set a 2030 emissions reduction target (indicator EP 2a). However, no country has a historical emissions trend or 2030 target aligned with its national 1.5°C benchmark (indicator EP 2c). ASCOR calculates the targeted reduction relative to 2019 emissions (metric EP 2ai), and almost 75% of the countries are below their corresponding benchmark, with values less than a -0.5%.
- 80% of the countries (56) have set a net zero CO2 target (indicator EP 3a). These countries are primarily from Europe, Central Asia, Latin America, and the Caribbean. Most of them have set 2050 as the target year (metric EP 3ai), with thirty-eight of the 45 high-income countries committing to net zero by 2050 at the latest. However, there are some countries that have set earlier target years: 2030 (Barbados, Norway), 2035 (Finland), 2040 (Austria), and 2045 (Denmark, Germany, Sweden). And others have set later target years: 2053 (Turkey), 2060 (Bahrain, China, Kazakhstan, Russian Federation, Saudi Arabia), and 2070 (India, Nigeria). Regarding the alignment of these net zero targets with a global 1.5°C scenario (indicator EP 3b), ASCOR identifies 38 countries as aligned, 7 as not aligned, and 25 as exempt.³⁹

3.4.Climate Action Tracker (CAT)

The Climate Action Tracker (CAT) is an independent scientific project resulting from the collaboration between two organizations, Climate Analytics and the NewClimate Institute⁴⁰. CAT tracks government climate actions and measures them against the globally agreed Paris Agreement. It quantifies and evaluates climate change mitigation targets and policies implemented by governments, assessing how these are likely to

³⁵ Accounting for more than 85% of global greenhouse gas (GHG) emissions and 90% of global GDP.

³⁶ Details on the framework and data are available on the website <https://www.ascorproject.org/>.

³⁷ See Scheer et al. (2024) for further details.

³⁸ Based on the indicators EP 2a, EP 2c, EP 3a, EP 3b, and the metrics EP 2ai, EP 3ai.

³⁹ Countries that are exempt from aligning their net zero emissions targets with the 1.5°C limit of the Paris Agreement are usually those not included in Annex I of the Agreement."

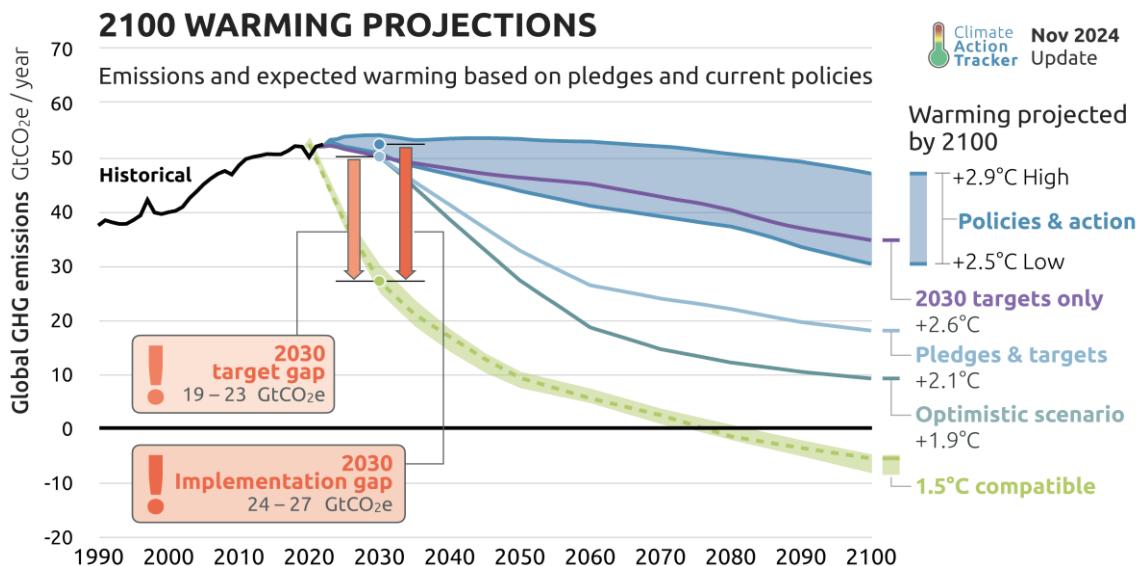
⁴⁰ More details and data are available on the website: <https://climateactiontracker.org/>

affect national emissions up to 2030. CAT covers the actions of 39 countries and the European Union, accounting for around 85% of global emissions. It assesses global emissions pathways consistent with government actions and identifies the gap between the Nationally Determined Contributions (NDCs), pledges, policies, and the emissions needed to comply with the Paris Agreement goal of limiting the increase in global average temperature to well below 2°C above pre-industrial levels.

Specifically, the tools developed by CAT include: i) a thermometer indicating the likelihood of goals being met or specific temperatures being exceeded, b) an assessment of the emissions gap between the expected absolute emissions in 2030 and the emissions consistent with the pathway aligned with the 1.5°C Paris Agreement goal, c) a 2035 climate NDCs target update tracker, and d) a net zero target evaluation through ten elements to assess whether the scope, architecture, and transparency meet what CAT defines as good practice.

According to CAT, current global policies are projected to result in a median warming of about 2.7°C, considering the combined low and high ends of current policy projections. Nationally Determined Contributions (NDCs) alone are expected to limit warming to 2.6°C. When binding long-term or net-zero targets are included, warming would be limited to about 2.1°C above pre-industrial levels. In probabilistic terms, this means there is a likely (66% or greater chance) limit of warming below 2.3°C. See Graph 7 and Climate Action Tracker (2024) for more details.

Graph 7. Climate Action Tracker: global emissions



Source: Climate Action Tracker (2024). Copyright ©2024 by Climate Analytics and NewClimate Institute.

They perform assessments for specific countries and for the EU. For the EU, CAT assigns an overall rating of “Insufficient” to its climate action and current 2030 emissions reduction target, considering that it is not fully on track to meet its goal of reducing emissions by at least 55% below 1990 levels (including LULUCF). CAT's assessment indicates that if the EU fully implements its planned policies under the Fit for 55 and REPowerEU initiatives, it will be close to achieving its 2030 NDC target. However, they point out that not all proposals have been adopted, and the targets and measures outlined in member states' National Energy and Climate Plans would be also insufficient to meet the EU's targets. Additionally, the EU's 2030 NDC target lacks ambition according to CAT, meaning that more rapid and significant emission reduction measures will be necessary later to follow a 1.5°C compatible pathway and achieve climate neutrality by mid-century. Finally, CAT rates the EU's net zero target as “Acceptable” in terms of its architecture, transparency, and scope, with a regular review and assessment process, although there is room for improvement. Specifically, there would be a need for separate reduction and removal targets and clarity on the fairness of targets regarding international aviation and shipping.

4. Puzzle pieces in the case of companies.

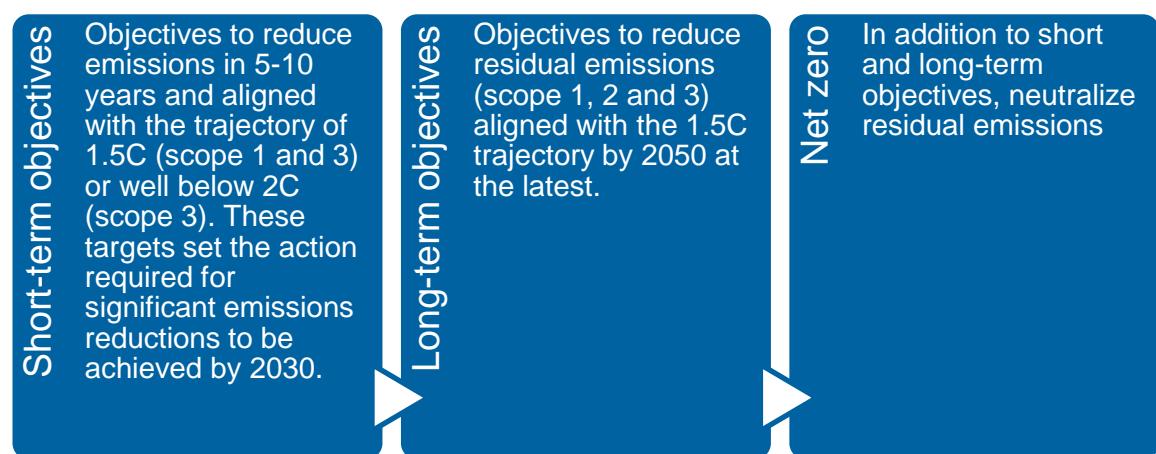
In the case of companies, various initiatives have been developed to create metrics and frameworks that gather information on how companies are setting and achieving their climate targets. Depending on the source data and methods used, the results of analyses may differ. Some examples include the Science Based Targets initiative (SBTi), Net Zero Tracker, Paris Agreement Capital Transition Assessment (PACTA), Transition Pathway Initiative (TPI), Carbon Tracker's 2 Degrees of Separation, and the. Additionally, private data providers are also developing metrics and forward-looking indicators. This article will focus on SBTi and Net Zero Tracker.

4.1. The Science-Based Targets initiative (SBTi)

One widely used framework is the Science-Based Targets initiative (SBTi)⁴¹. Launched in 2015, its goal is to create a critical mass of companies that set and implement science-based GHG emissions reduction targets aligned with the Paris Agreement. Goals are considered science-based if they align with what science determines is necessary to comply with the Paris Agreement. Fundamentally, the SBTi establishes three types of objectives, as shown in infographic 4.

Furthermore, the SBTi includes information on commitments that reflect an organization's intention to develop objectives. These commitments are reviewed by the SBTi within a maximum period of two years, and those that do not comply with their commitments will be identified with the status "Commitment removed." Additionally, there are three available target-setting methods: (i) absolute emissions contraction, (ii) the Sectoral Decarbonization Approach, and (iii) economic intensity contraction.

Infographic 4. SBTi types of objectives:



⁴¹ The SBTi was formed as a collaboration between CDP, the United Nations Global Compact, the World Resources Institute (WRI), and the World Wide Fund for Nature (WWF). The goal of SBTi is to ensure that companies have the tools to set goals aligned with climate science and that these methods are transparent, robust, and plausible. See <https://sciencebasedtargets.org/about-us>

4.1.1. SBTi data set

This framework contains primarily two types of datasets⁴²:

- First, the annual Monitoring and Target Reports, in which the SBTi and its partners present the results of their review of companies that have set science-based targets by the end of the year (e.g., December 31st, 2022)⁴³. Each review is based on publicly available information (questionnaires and other public documentation such as non-financial statements, corporate reports, websites, etc), excluding companies removed from the initiative. This annual report is made available to the public during the third quarter of the following year.
- Additionally, the SBTi allows users to explore and download the most up-to-date data through its dashboard⁴⁴. This information is updated weekly and includes high-level details about each organization's targets or commitments. It presents information on short-term (ST) and long-term (LT) targets, along with the temperature alignment of the companies (1.5°C, well-below 2°C (WB2), and 2°C) and the net-zero (NZ) commitments, which demonstrate an organization's intention to develop targets and submit them for validation within 24 months.

The dataset includes 9,339 companies from 101 different countries across six regions: Africa, Asia, Europe, Latin America, North America, and Oceania. Over 80% of the companies are located either in Europe (51%) or Asia (31%), followed by North America (13%).. See Table 3 for more details.

⁴² Analysis based on SBTi Monitoring report (2022) and the detailed data file from <https://sciencebasedtargets.org/companies-taking-action>

⁴³ The latest publicly available annual Monitoring and Target Report is the 2023 version (only available in PDF). Compared to the 2022 version, the company progress data (in Excel file) for December 31st, 2023, is currently not available, and it is unclear whether it will be made publicly available. Therefore, our analysis of the annual Monitoring and Target Reports is based on the 2022 version. As of December 2023, more than four thousand companies had validated science-based targets, meaning that over two thousand companies set science-based targets during the year. It is worth mentioning that given the significant growth of companies joining the initiative (+102%) during the year 2023 findings from the 2022 report might be not very updated. To illustrate this, we will mention the most relevant figures from the 2023 report compared to the previous one.

⁴⁴ However, at that point in time, these data have not yet been reviewed by the SBTi or any other partner. A more up-to-date version of the data is available through the dashboard information. The analysis in this paper is based on data available as of August 26, 2024.

Table 3: Companies in dataset by region of location

Region	Number of companies	%
Europe	4,759	51%
Asia	2,858	31%
North America	1,254	13%
Latin America	229	2%
Oceania	158	2%
Africa	81	1%
Total	9,339	

Source: own elaboration based on SBTi data

Regarding the economic sectors of the companies within the sample, they belong to 57 different sectors. Ten sectors account for more than 55% of the total companies. The most represented sectors in this dataset are Professional Services, Electrical Equipment and Machinery, Software and Services, Food and Beverage Processing, Textiles, Apparel, Footwear and Luxury Goods, and Construction and Engineering.

In terms of company type, over 61% of the companies in the sample are non-financial corporations (5,733 companies), 36% are Small and Medium Enterprises (SMEs) (3,332 companies), and 3% are financial institutions (274 companies).

4.1.2 SBTi Results

Overall, the results of the dashboard align with those obtained from the Annual Monitoring Report. Additionally, both datasets complement each other⁴⁵. Our analysis focuses on the targets set by the companies within the sample. We find that 64% of the companies have already set a ST target (see Table 4), 31% have “committed” to setting a ST target within two years, and a 5% of the companies’ ST targets have been removed from the sample. Regarding LT targets, only 12% of the companies have already set such goals.

⁴⁵ The dashboard shows the target classification (under which scenario the company is currently performing) and the company status on the targets (targets set, committed, etc.). The Annual Monitoring Report specifies the scopes involved, the percentage figures of reduction, which ultimately allows reaching a certain scenario (1.5°C, WB2, etc.), and even the target progress, which may indicate action towards the target, signaling plausible alignment with the Paris Agreement.

Table 4: Number of companies setting long and short term (ST) targets

Total number of Companies	9,339	
of which:	Short Term	Long Term
Targets set	5,969	1,082
Committed	2,867	
Removed	503	
NA		8,257

Source: own elaboration based on SBTi data

In terms of ST targets, nearly all (92%) are aligned with the 1.5°C scenario, while the rest are aligned with the Well Below 2°C (WB2) scenario (see Table 5 – column A). Additionally, among those with ST targets, only 18% have already set LT targets. By region, Europe is the most represented, with over 50% of the companies located there, followed by Asia (31%) and North America (12%).

Regarding LT goals, only 12% of companies have already set this type of targets (1,082 companies), and all of them are aligned with the 1.5°C scenario (see Table 5 – column B). Additionally, all these companies have also set ST targets.

Table 5. Scenario alignment for companies setting short and long term targets

Targets set	A. Short Term	B. Long Term
of which, scenario aligned:		
1.5	5,969	1,082
WB2	5,516	1,081
2	406	
NA	47	
		1

Source: own elaboration based on SBTi data

SBTi data reveals information regarding net zero (NZ) commitments, showing that almost 40% of companies in the total sample (3,427 companies) are committed to achieving NZ by 2050⁴⁶. Of this sub-sample, more than 45% have set ST targets, mostly aligned with the 1.5°C scenario, while 25% have set LT targets, all aligned with the 1.5°C scenario (see Table 6).

⁴⁶ This commitment will have to be reviewed by SBTi.

Table 6. Companies committed to Net Zero by type of target set.

Net-zero committed	Yes (3,427)	
of which:	Short Term	Long Term
Targets set (total)	1,640	1,078
1.5 °C	1,585	1,078
WB 2°C	45	-
2 °C	10	-
NA	-	-

Source: own elaboration based on SBTi data

It is worth noting that only 10% of companies within the sample have set both ST and LT targets and are committed to NZ simultaneously (see table 7), and most of these companies have disclosed 2030 as the target year to achieve their goals. Among those committed to NZ and with LT targets, almost 70% are located in Europe.

Regarding the information contained in the Monitoring and Target Reports, main findings of the short-term targets include:

- Regarding the target type, most companies rely on absolute reduction targets.
- Regarding the scope of the targets: Scope 1+2 is the most predominant followed by Scope 3
- For those with Scope 1+2: The most relevant base years are 2019, 2020, and 2018, in that order. And the most common target years are 2030, followed by 2025.
- For all the most represented sectors in the sample, scope 1+2 is the most predominant scope in terms of number of companies disclosing, followed by scope 3.

Main findings of the long-term targets include:

- Regarding the target type, most companies rely on absolute reduction targets.
- Regarding the scope of the targets: Total emissions (Scope 1+2+3) is the most predominant followed by Scope 1+2
- For those with Scope 1+2+3: The most relevant base years are 2019, 2020, and 2021, in that order. And the most common target years are 2050, followed by 2040.

Table 7. Summary of setting short and long term targets and net zero commitments

Number of companies in the sample:	9,339					
Short- term (ST) targets:						
Targets Set	5,969 64% of which, Scenario alignment:					
Comm	2,867	31%	1.5	5,516	92%	
Rem	503	5%	WB2	406	7%	
			2	47	1%	
			NA			-
Long- term (LT) targets:						
Targets Set	1,082 12% of which, Scenario alignment:					
NA	8,257	88%	1.5	1,081	100%	
			WB2	-	-	
			2	-	-	
			NA	1	0%	
Net-zero committed:						
Yes	3,427 37%	of which, ST targets:	3,427			
No	5,912	63%	Targets already set	1,640	48%	
			Committed	1,520	44%	
			Removed	267	8%	
			NA	-	-	
		of which, LT targets:	3,427			
		Targets already set	1,078	31%		
		Committed	-	-		
		Removed	-	-		
		NA	2,349	69%		
Number (and %) companies that have already set ST targets, LT targets and NZ commitments:	925	10%				

Source: own elaboration based on SBTi data

4.1.3 Constraints

Regarding the information contained in the Monitoring and Target Reports, there may be multiple lines for each company depending on various factors: the target (short-term, long-term, and net zero), the target type (absolute, intensity), the scope (1, 2, 3, or total), and within the indirect emissions (Scope 3), the categories included, base year, and target year. Obviously, all of this makes it difficult to properly process and summarize. Moreover, the lack of identifiers such as ISIN codes and LEI codes makes matching and

comparing with other datasets difficult. Comprehensive identifying information would be ideal for merging these datasets with others containing, for instance, information on carbon emissions.

The relative importance of each scope within a company's total emissions varies depending on the company's main activity. Therefore, the distribution of emissions between direct and indirect emissions will depend on the sector to which the company belongs. However, some deviation in behavior among companies within a sector is to be expected. Another important point is that companies should disclose targets based on their main sources of emissions. For those whose primary source of emissions come from direct emissions should ideally disclose accordingly targets on scope 1+2.

4.2 Net zero tracker

Net Zero Tracker is an independent tool that provides a comprehensive view of net zero commitments across all nations and the world's largest regions, cities, and companies. They collect data on targets set and the factors that indicate whether those targets are robust—essentially, how serious companies and governments are about meaningfully cutting their net emissions to zero. It relies on publicly available data sources such as company websites, press releases, and other public information⁴⁷.

It includes several indicators on targets (interim, net zero) and their status, whether there is a published plan in place and/or a reporting mechanism, the gases covered, and the scopes involved (companies' direct and indirect emissions). In addition, for the identification of the companies the sector and the ISIN code are available, allowing for matching and comparison with other datasets.

Specifically, when considering the targets set by companies, it provides information on “interim” and “end” targets:

- interim targets refer to the earliest targets set by the company such as emissions reduction targets, emissions intensity targets, or absolute emissions targets.
- end targets refer to how the company describes its own target in the long run that can be described in multiple ways and the expert would try to find the best fit from various options: net zero, zero emissions, zero carbon, climate neutral, climate positive, carbon neutral, GHG neutral, carbon negative, net negative, 1.5°C targets, science-based targets, among others. Several assumptions are made if companies are members of Business Ambition for 1.5°C or SBTi.

⁴⁷ They regularly capture input both manually and using machine learning techniques such as web scraping. The team then analyzes each entity following a guideline (codebook).

Alternatively, the company may disclose emissions reduction targets, emissions intensity targets, or absolute emissions targets.

To fully understand the information underlying the indicators, both types of targets need to be considered along with other variables, including target notes and other qualitative information⁴⁸. Regarding the coverage of gases, the following alternatives apply: CO2 only, CO2 and other GHGs, and not specified⁴⁹. Information on the scopes of gases (scope 1, 2 or 3) are also collected.

Some limitations of these database are: i) the analysis is limited to the 2.000 largest publicly-listed companies (according to the Forbes 2000 list) and the 100 largest privately-owned companies worldwide, ii) the timing of the information, since they exclusively rely on public disclosures the information contained might not be the most up-to-date

4.2.1 Net zero tracker data set

Half of the data in Net Zero Tracker comprises company level data. In total, there are more than 4000 observations including almost 200 nations, over 700 regions, almost 1,200 cities and over 2,000 companies. See table 8.

Table 8: Classification of entities

Entity type	count	%
Countries	198	5%
Regions	711	17%
Cities	1,186	28%
Companies	2,076	50%
Total	4,171	100%

Source: own elaboration based on Net zero tracker data

⁴⁸ While interim targets need to be considered together with the interim target year and interim target text, end targets need to be examined along with the end target year, end target text, and end target status. Target years refer to the year in which the target is expected to be achieved. The target status indicates the current status of the target: achieved (externally or internally validated), included in the corporate strategy (in policy), pledged (announcement), or under discussion.

⁴⁹ If an important gas is missing, it is recorded in the relevant note field. For companies, information on the scopes of gases included in the targets may be disclosed. For Scope 1 and 2, only "Yes," "No," or "Not specified" may be answered. Additionally, for Scope 3, partial coverage can be answered.

Focusing on companies, the analysis is based on the data available as of November, 5th 2024. Starting with the location, nearly all the companies are in three main geographic regions: East Asia (35%), North America (34%), and Europe (22%) as it is shown in Table 9. The most prevalent countries within the sample are the United States of America (30%), China (14%), and Japan (11%), followed by Great Britain (4%) and France (3%).

Table 9: Companies in data set by region of location

Geographic region	count	%
East Asia	717	35%
North America	696	34%
Europe	466	22%
Western and Central Asia	57	3%
South Asia	51	2%
Latin America and the Caribbean	42	2%
Oceania	32	2%
Africa	15	1%
Total	2,076	100%

Source: own elaboration based on Net zero tracker data

4.2.2 Results from Net Zero Tracker

When considering the targets set by companies, of the 2,076 companies, less than half set interim targets (1,121 companies). Among these, 72% have set an emissions reduction target, while only 1% have set an absolute emissions target (see table 10). When referring to end targets, 75% of the companies (1,556) have them. More than half of these companies have set net zero end targets, making it the most common type of end target. This is followed by carbon neutral targets, which account for 19% of the sample. So we can see that the number of companies that have set an end target is higher than those with interim targets.

Table 10: Summary of the Net zero tracker data interim and end target types

Number of companies in the sample:	2,076	
Interim targets:	1,121 (54%)	100%
Emissions reduction target	808	72%
Other	133	12%
Net zero	111	10%
Emissions intensity target	62	6%
Absolute emissions target	7	1%
End targets:	1,556 (75%)	100%
Net zero	832	53%
Carbon neutral	298	19%
Emissions reduction target	255	16%
Climate neutral	46	3%
Other: science-based targets, zero emissions, climate positive, zero carbon, etc.)	86	6%
Emissions intensity target	37	2%
Absolute emissions target	2	0%

Source: own elaboration based on Net zero tracker data

4.3. Comparison of results from two datasets: SBTi and Net zero tracker

Comparing the Net Zero Tracker data with the dashboard version of the SBTi data, we can examine the similarities and differences between the populations. Using the broader version of the SBTi data (Annual Monitoring Report) is not recommended for this purpose, as it is not as timely as the Net Zero Tracker. Given that many companies are joining the initiative lately it would imply missing many companies.

With regards to targets, it is possible to compare the Net Zero Tracker information with either the Monitoring Report or the dashboard version of the SBTi. However, comparing the former is more detailed in terms of the type of target set. We have observed that, when controlling for the company, there are discrepancies in the type of target reported⁵⁰. See Table 11.

We select companies with a short-term (interim) target, resulting in 927, 1,625, and 1,091 unique companies, for the SBTi monitoring report, dashboard version, and Net Zero Tracker, respectively. When considering base and target years for interim targets we identify less discrepancies compare to targets. Besides, we observe wide ranges for both base and target years being 2019 the most frequent base year and 2030 the most common target years.

When merging the Net Zero Tracker dataset with the dashboard version, we find more matches than with the Monitoring Report (416 vs. 299). As mentioned in the previous section, there are differences in the population and methodology among the datasets. Therefore, when comparing the Net Zero Tracker with the Monitoring Report, we often find multiple targets in the SBTi dataset corresponding to a single target in the NZ Tracker.

⁵⁰ The SBTi monitoring report includes 2,077 unique companies. However, the dashboard version contains 9,339 unique companies. The significant difference is due to the version of the data, with a one-year gap between them. The Net Zero Tracker contains 2,074 unique companies, which is significantly smaller compared to the dashboard version. This difference is explained by the fact that the Net Zero Tracker includes the 2,000 largest publicly-listed companies (according to the Forbes 2000 list) and the 100 largest privately-owned companies worldwide. Companies without an ISIN code are then discarded, reducing the three samples to 927, 2,495, and 1,971 unique companies for the SBTi monitoring report, dashboard version, and Net Zero Tracker, respectively.

Table 11: Main figures and comparison

Main figures	SBTi		Net Zero tracker
	Monitoring report	Dashboard	
Number of unique companies in the sample:	2.077	9.339	2.074
<i>of which:</i>			
with ISIN code	927	2.495	1.971
with interim target set	927	1.625	1.091
Base year (range)	2005-2022		1990-2030
most frequent value	2019		2019
Target year (range)	2020-2050		2016-2044
most frequent value	2033		2030
Comparisons			
<i>SBTi Monitoring report v NZ tracker</i>			
Concurrencies	299		
Target	258		
Base year (range)	216		
Target year (range)	239		
<i>SBTi Dashboard v NZ tracker</i>			
Concurrencies	416		
Target	416		
Base year (range)	na		
Target year (range)	267		
Version of the data:	August, 2023	August, 2024	October, 2024

Source: own elaboration based on SBTi and Net zero tracker data

5. Final remarks

Establishing a decarbonization pathway to achieve the Paris Agreement targets involves developing specific final and intermediate targets as part of a transition plan. This process must be grounded in both backward-looking and forward-looking data and metrics. The former helps understand past trends and serves as the foundation for forward-looking metrics that project into the future.

So far, the assessment of climate change risks has relied mostly on past or backward-looking data. However, new methodologies and indicators are needed to support the development of decarbonization pathways. Currently, several initiatives aim to provide transparency to the various available information, while others are developing specific metrics.

Results differ depending on the data sources used, and only a limited number of firms, mainly large ones, are currently disclosing forward-looking indicators. Differences in results can be partly explained by variations in methodology. These methodologies are not always easy to understand, nor are they always comparable or communicated transparently. Therefore, their appropriate usage depends on specific use cases.

At the same time, it is important to combine targets from countries and corporations to ensure coherence in a common path to achieve net-zero emissions and the Paris Agreement targets. Based on the analysis in this paper, it currently seems challenging to align the sum of targets and trajectories.

This document is intended to give an overview of current initiatives and selected publicly available data on forward-looking transition risk metrics. A deeper analysis of results is still needed going forward in order to gain a better understanding of methodologies and differences in results.

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