INSTITUT Louis Bachelier

THE ALIGNMENT COOKBOOK 2

A technical panorama of the alignment methodologies and metrics used by and applied to the financial sector, with a view to inform consolidated alignment assessments

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1 Agence de l'Environnement et de la Maîtrise de l'Énergie.

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The Paris Agreement sets the collective impact objective of "**limiting global temperature rise levels well below 2°C above pre-industrial levels and pursuing the efforts to limit the temperature increase to 1.5°C above pre-industrial levels**".

To achieve this objective, a deep transformation of our economical and operational models from the current highly-emitting economy towards a low-carbon economy is needed. These transformations require strong investments. The indirect yet crucial role that finance can play is identified explicitly in the Paris Agreement, Article 2.1c, which states the objective to **"[make] financial flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development**".

"Making financial flows consistent" needs by construction **an upstream thinking** on which transformations are required in the real economy, at which size and at which pace, i.e acceptable pathways. This is the work performed by transition scenarios builders. As of today, there is however **no global consensus on a single transition scenario.** In this context, aligning **financial flows with a pathway remains a "relative" matter**, the planification of the economic transformation itself being outside of the financial sphere.

The financial sphere comprises other actors than the financial institutions themselves: public financing, state-owned companies, personal-owned companies, etc. In addition, some "activities" relevant from a climate perspective are not tied to the financial sphere, such a ecosystemic services (e.g. ocean behaviour) and economical and social systems relying on non-financial functioning (e.g. volunteering). Thus, making financial flows consistent does not mean that the world will necessarily be fully on track to reach the temperature limitation objective.

These reflections in mind, it is acknowledged that (i) in the current state of the global economy, the financial sphere has a crucial role to play[2] and (ii) there is no need to wait for a full consensus on what the transition should look like and how the burden of the transition should be shared among financial and non-financial actors to push the reflection on how the financial sector should make financial flows consistent with the Paris Agreement objectives.

To catalyse action, climate investors' alliances and Net Zero initiatives build on social science research which suggests that large-scale societal transformations can be more easily achieved with a centralised infrastructure to develop a shared vision and framework for moving forward (Kania, John & Kramer, Mark., 2011).

They create an unprecedented backbone support in the financial market, enabling a necessary first step toward a collective impact dynamic in achieving climate goals. These alliances and initiatives create the conditions for their members to learn of one another's approaches and share a common agenda.

In parallel, climate-related regulations seek to create the necessary incentives and conditions to frame, guide, enable and monitor the financial sector. An increasingly complex regulatory infrastructure is emerging in Europe and other regions of the world (SFRD, 2019; CSRD, 2022; MiFid II, 2022; EU Green Bond Standard, 2023; CSDDD; ESG regulation, 2023), underpinned by collective impact objectives, both in terms of climate and economic stability.

One challenge relates to monitoring the progress of the financial sector's alignment with the Article 2.1(c) objective and contribution to the global collective objectives at a systemic level, especially for financial actors that operate "at a number of steps removed from real-economy activities" (UNFCCC. SCF, 2022).

2 A study evaluates at 55% the share of the global investing efforts to reach the Paris Agreement objective, see McKinsey, IIF, Financing the net-zero transition: From planning to practice (January 2023).

The UNFCCC global stocktake process aims at enabling "countries and other stakeholders to see where they are collectively making progress toward meeting the goals of the Paris Agreement – and where they're not. It's like taking inventory" (UNFCCC, 2023). The Fifth Biennial Assessment and Overview of Climate Finance Flows report and associated preparatory documents (UNFCCC. SCF, 2022; UNFCCC. SCFa, 2022; UNFCCC. SCFb, 2022) note that there is "no common vision among Parties on what information may be relevant to Article 2.1(c)".

Concerning private finance, it uses figures on the scale and volume of financial initiatives related to efforts to achieve the goal set out in Article 2.1c. The series of documents highlight the wide range of approaches used by financial institutions to make their financial flows consistent with article 2.1(c), along with the increasing efforts being made to "enhance the transparency and comparability of approaches".

Finally, it notes that "the ambition to ensure real-economy impacts through financial alignment approaches is a consistent feature of net zero commitment and target setting initiatives, as for example in the case of the Institutional Investor Group on Climate Change (IIGCC) and Paris-Aligned Investment Initiative (PAII), Net Zero Asset Owner Alliance (NZAOA), Net Zero Asset Manager Alliance (NZAM), and the Net Zero Banking Alliance (NZBA)" but that "assessing the impact and level of change that financial sector alignment approaches initiate in the real economy is a nascent area of methodological development".

OVERARCHING OBJECTIVE OF THE CAPA PROJECT

This report is part of the *Consolidated Alignment Performance Analytics* (CAPA) research project, developed and led by the Institut Louis Bachelier Labs in partnership with Scientific Portfolio (an EDHEC Venture), and financed by the French environmental agency ADEME[3] and Climate arc.

The overarching objective of the CAPA research project is **to develop an approach to assess the consolidated alignment of different *groups of financial institutions* such as financial centres with low-carbon pathways commensurate with the global net zero objective (thereafter "consolidated alignment assessments").**

While there is an increasing body of research on assessing alignment at the entity- and portfolio-level, assessing the alignment of a *group of financial institutions* has rarely been discussed beyond measures on the scale and volume of financial initiatives. Relying on a patchwork of micro-level methodologies and metrics as a proxy for consolidated alignment runs the risk that hundreds of gigatonnes of carbon are lost in translation when converting the global carbon budget into multiple alignment assessments.

As such, the CAPA project seeks to contribute to the advancement of research on how to monitor the collective progress made in achieving the purpose and goals of Article 2.1(c). It aims to develop an approach to assess the consolidated alignment of financial institutions by exploring how methodologies that operate at the micro-level (financial asset, portfolio, financial institution, with a specific focus on portfolio alignment methodologies) can be meaningfully consolidated into higher categorical groups (e.g. group of financial institutions).

The research project is split into three phases:

- *The first phase, achieved through the publication of the present Alignment cookbook II, reviews the range of existing frameworks, methodologies and tools that exist to assess the alignment of financial institutions and portfolios. As the purpose of this document is to perform a review, it will remain at a technical level without judging the relevance of one versus another.*
- *The second phase, based on the technical panorama achieved through the first phase, will identify the different options that are the most suitable to assess the consolidated alignment of a group of financial institutions and suggest a methodology.*
- *The last phase will apply and test the methodology suggested in the second phase to different groups of financial institutions.*

A series of research reports will be published in 2024 and 2025 as part of the CAPA project.

3 Agence de l'Environnement et de la Maîtrise de l'Énergie.

OBJECTIVES OF THIS REPORT: THE ALIGNMENT COOKBOOK 2

This report is one of the output(s) of the first phase of the CAPA project, together with Implied Temperature Rise of equity portfolios: a sensitivity analysis framework.

Understanding the type and structure of existing alignment methodologies used by financial institutions and other parties at the micro-level is useful to assess: 1. whether specific types of alignment methodologies and design principles are more desirable than others to assess the consolidated alignment of a group of institutions, and 2. whether the results of existing methodologies at the micro-level can be reconciled and fed into a consolidated assessment.

Following the publication of the Alignment Cookbook in 2020 (ILB, 2020), several studies have been published to review in detail the methodologies used by financial institutions to align their financial flows with low-carbon pathways including but not limited to PAT, 2020; PAT, 2021; GFANZ, 2022; INFRAS, 2022; OECD, 2022.

This research corpus forms the basis of this report.

The specific purposes of this report are to:

- Update the information from past research reports, mainly the Alignment Cookbook (ILB, 2020), in particular the description of the various alignment methodologies available on the market ("Detailed review of Alignment methodologies").
- Widen the scope of previous work, by focusing on a wider range of alignment methodologies, financial institutions, activities and asset classes, increasing the number of methodologies reviewed from 10+ in the Alignment Cookbook (ILB, 2020) to 50+.
- Show the articulation between financial institutions' transition plan assessments methodologies, portfolio- and financial asset-level alignment methodologies.
- Develop a detailed categorisation of alignment methodologies based on what they are trying to capture ("focus")[4].
- Define and describe which of the design choices identified in prior research are most relevant from a consolidated alignment perspective.

Notably, this report does not seek to rate or judge existing methodologies. It establishes an inventory of what already exists in alignment research - seeking to classify existing methodologies based on what aspect of alignment they can be used to capture.

This report will be supplemented by a sensitivity analysis report led by Scientific Portfolio (an EDHEC Venture).

This analysis aims to extend the present inventory by proposing a quantitative analysis of the impact of different options for these design choices on the final ITR metric. The analysis is based on a generic ITR model developed from existing literature and the specific analysis of +50 ITR methodologies in this report (ILB, 2024). This model takes up the main steps conceptualised by PAT (2021) - construction of a benchmark at counterparty level, projection of their emissions, and aggregation at portfolio level to measure an over or under shoot emissions budget in relation to a given scenario - and proposes 15 parameters linked to these steps for which different options are possible. The model is specific for the analysis of equity portfolios, but most of the choices studied are common to methodologies applicable to other asset classes. Unlike analysis using several tools for the same portfolio (e.g. ILB, 2020), this approach enables us to isolate the impact of each technical choice, all other things being equal.

4 Prior research on alignment methodologies focus on detailing the methodological choices that can be made when designing them. While this report also discusses this in part 3, it takes a step back and seeks to understand what is meant by "alignment" within these different methodologies.

EXECUTIVE SUMMARY

1. THE MENU - NAVIGATING AN INCREASINGLY-COMPLEX NET ZERO ECOSYSTEM

1.1. Defining alignment: from the planetary net zero objective to the role of financial institutions

This part defines the key concepts relating to alignment at different levels, from the planetary objectives embedded in the Paris Agreement to alignment at non-state entity-level (including financial institutions) and portfolios.

Net zero designates the state to be reached at planetary level, where "anthropogenic emissions to the atmosphere are balanced by anthropogenic removals over a specific period" (IPCC, 2018). Net zero is fundamentally a collective impact objective.

Businesses and financial institutions cannot *be* "net zero" strictly speaking, but rather they can contribute to reaching the planetary objective of net zero emissions (see ADEME, 2021 for example). This puts an emphasis on action and highlights that the level and type of effort needed may be different from one entity to another, for example depending on its capacity and responsibility. While most traditional economic actors are likely to keep residual carbon emissions, others (such as forestry assets) will have to be "net negative" for "net zero" to be reached at planetary level.

The concept of alignment is ambiguous. At its simplest level, "alignment" refers to the consistency or compatibility, of an entity's or portfolio's climate performance, expressed through a variety of metrics, with pathway(s) commensurate with the net zero planetary objective.

As discussed in the Alignment Cookbook, "alignment with low carbon pathways (e.g. well below 2°C or 1.5°C)"; "alignment with the Paris Agreement"; and "net zero alignment" is often used interchangeably but there are important differences between these concepts including but not limited to the inclusion of the topic of removals (ILB, 2020).

In addition, the concept of alignment is sometimes used as a semantic shortcut to designate the extent to which a non-state entity *contributes* to the global efforts needed to reach net zero at planetary level. Yet, consistency or compatibility with low-carbon pathways is *not* to be confused with contribution and real-world decarbonization impact (ILB, 2020). Indeed, assessing an entity's contribution involves understanding whether the actions it took to align climate performance had a measurable impact in terms of GHG emission reduction.

The indirect, yet crucial and unique role that financial institutions can play in the global effort to reach net zero at the planetary level is recognized in the Paris Agreement. In particular, Article 2.1c states the objective to "[make] financial flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development".

As for non-financial entities, "alignment" does not *necessarily* mean contribution and impact. Indeed, financial institutions' contribution refers rather to the "actions that intend to generate positive impact on climate goals" (I4CE, 2021). It is defined as part of an institution's target and strategy, which respectively define the institution's level of ambition and how it aims to achieve it over time. As such, contribution goes further than alignment understood as consistency.

1.2. Understanding the ecosystem of alignment tools for the financial sector: a panorama

This part provides an overview of the ecosystem of alignment tools developed for and/or used by financial institutions, from alignment frameworks to specific methodologies and metrics. These methodologies are diverse, operate at different levels (financial institution, portfolio and financial asset) and focus on different aspects of the alignment challenge. As such, they can be seen as complementary, yet no consensus exists (yet) on how to use them together, let alone consolidate them to produce an alignment assessment at the level of a group of financial institutions. A summary cartography is provided on p.15**.**

Since the Paris Agreement, the topic of "alignment" has taken centre stage when embedding climate considerations in financial strategies. An increasing number of public and private actors and coalitions are working to guide the financial sector in contributing to the global goals, to act as a compass and create a critical mass of financial institutions taking action.

Together, they outline what financial institutions can do to align their activities and actions and contribute to the planetary objective.

The process through which financial institutions plan their alignment journey is called "transition planning". A growing body of voluntary and regulatory frameworks encourage/require financial institutions to 1. Develop transition strategies, 2. Devise "transition plans" and "transition roadmaps", and 3. Disclose. They also provide guidance, or methodologies, for implementing the alignment journey in whole or in part.

All these frameworks highlight that financial institutions need to take a high-level commitment and set specific time-bound targets, back their commitments and targets with robust plans and strategies, embed these into organisational processes and systems, monitor and disclose progress.

When deep-diving into the specific guidelines, it becomes apparent that these frameworks differ, not only in terms of detailed content but also in terms of their levels of prescriptiveness and space for interpretation. This leads financial institutions to implement varying practices.

Methodologies are being developed that build on these frameworks to assess a financial institution's progress along its alignment journey, its global approach to net zero and the quality of its transition plan as a whole, including the presence and adequacy of net zero targets and the strategic and organisational means put in place to achieve them.

Alignment assessments of financial institutions can be divided in two main kinds:

- Most of these methodologies evaluate financial institutions' alignment approach using qualitative data on the financial institutions' approach to net zero, using indicators such as: "has the financial institution set a portfolio decarbonization target that covers a significant share of its portfolios" or "has the financial institution published a transition plan".
- A small number of methodologies go further by including a *quantitative assessment* of financial institutions' adequacy of targets' and/or portfolio alignment with low-carbon trajectories, alongside qualitative indicators. These include for example ACT Finance, the TPI banking framework[5], the CDP Net Zero Assessment dataset[6] and Influence Map Climate Change methodology[7]. These methodologies are built on a combination of qualitative and quantitative alignment performance assessment elements.

Let's take the example of a financial institution that claims to have a robust decarbonization target, in line with the decarbonization pathways set by science. It is likely that methodologies that rely on qualitative data only attribute the highest rating to this criteria if the target is designed using certain rules deemed as important by the methodology - e.g. relevant perimeter, scenario, unit... Methodologies that re-assess the alignment of the target quantitatively may find, however, that the target is not ambitious-enough and therefore attribute a lower rating to this criteria.

A number of methodologies and metrics focus on the portfolio- and financial asset-levels. They are used by financial institutions to set portfolio-level targets, build and implement portfolio-level strategies to meet these targets, monitor and report on portfolio alignment progress. They can also feed into methodologies that seek to evaluate financial institutions' alignment approach (see above).

5 When taking together the TPI Carbon Performance and Management Quality modules.
6 Covers both FI and non-FI entities.
7 Itself based on PACTA for its portfolio Paris Alignment Scores.

Portfolio emissions footprints and green-brown activity share assessments offer a photograph in time of the climate performance of financial assets and investment portfolios but cannot be used *on their own* to make a *dynamic and qualified* assessment on the sufficiency/insufficiency of a portfolio's or financial asset's climate performance, with regards to the long-term global temperature objective.

Taxonomies are being developed around the world to support the identification of sustainable activities and by extension financial assets and portfolios, through taxonomy alignment metrics. While these metrics provide a much-needed qualified assessment of the (in)compatibility of a range of activities with the Paris objective, most of them remain threshold-based.

This observation led to the development of portfolio and financial asset-level alignment methodologies and metrics. **Alignment methodologies combine *past, current and/or projected* climate performance metrics, including emissions, green-brown activity share and taxonomy-alignment metrics, with data relative to downscaled carbon budget and associated low-carbon pathways.**

Portfolio and financial asset-level alignment methodologies have historically been used by financial institutions for exploratory purposes and reporting. Increasingly, these methodologies are used by financial institutions to set targets, monitor alignment and build strategies. These methodologies are diverse, sometimes complementary, as they focus on different aspects of the alignment challenge (decarbonization, investment in climate solutions, divestment from financial assets incompatible with the transition).

In their current state, the use of portfolio alignment methodologies by financial institutions and other stakeholders in effectively driving and monitoring alignment at different levels is limited by their diversity and heterogeneity as well as their unclear relation to real world decarbonization. We deep-dive into portfolio alignment methodologies in the next section.

In parallel, attempts at assessing the *consolidated current and projected* alignment of a group of financial institutions have remained limited. While there is an increasing body of research on assessing alignment at the entity- and portfolio-level, assessing the alignment of a *group of financial institutions* has been rarely discussed[8]. While financial institution level transition plan alignment assessments constitute an interesting avenue to do so, the challenge remains to incorporate a wide range of data sources - from current portfolio composition to portfolio-level targets and financial institutions' strategy and approach to net zero - and consolidate them at higher levels.

For additional information, see part 1.

2. THE RECIPES - DEEP-DIVE INTO PORTFOLIO ALIGNMENT METHODOLOGIES

This part deep-dives into portfolio-level alignment methodologies. It maps and classifies existing target-setting and alignment assessment methodologies based on their focus, and how they can be used by financial institutions in their strategies. The specific methodological choices that can be made when designing and implementing these alignment methodologies are reviewed in part 3.

Metrics and methodologies need to support the devising, implementation and monitoring of financial institutions' strategies and outcomes.

Within the last few years, **the focus has moved towards strategies that have a higher chance of resulting in real-world impact rather than strategies whose only focus was to decrease, often "virtually", the emissions associated with specific portfolios.** In fact, a number of strategies may lead to increased portfolio emissions in the short-term, such as investing in highly-carbon intensive financial assets gradually transitioning.

In this context, transition finance and associated strategies are taking a centre stage in discussions on the financial sectors' contribution to the goals of the Paris Agreement. There is a growing consensus that transition finance strategies are more likely to contribute more to real world decarbonization compared to traditional portfolio decarbonization strategies (EBA, 2023).

No unique definition exists on transition finance. The European Commission published its own definition in 2023 (European Commission, 2023), showing the articulation between sustainable and green finance: "Sustainable finance is about financing both what is already environmentally-friendly and what is transitioning to such performance levels over time".

8 PACTA is the only methodology, to the authors' knowledge, that has been used to generate consolidated alignment figures for groups of financial institutions, through the PACTA Coordinated Projects program (PACTA COP). These figures are based on current portfolio composi-tion.

The European Commission further clarified the definition of transition finance, as "financing of investments compatible with and contributing to the transition that avoids lock-ins." The proposed definition remains therefore at principles level and does not provide operational insights on which company/asset would be transitioning or not.

For additional information, see part 2.1.

2.1 Target-setting and alignment strategies

We classify portfolio-level targets into three buckets[9]:

- **Portfolio emissions targets** focus primarily on the emissions associated with financial flows. They can be set on emissions reduction or carbon removals, based on a range of metrics (absolute, intensity), apply at different-level of aggregation (sector, asset-class, activity, portfolio) and leverage different financial asset-to–aggregated level aggregation methodologies (ownership-based, weighted averages)[10].

These include portfolio emissions targets such as detailed in the PAII NZIF, NZAOA and NZBA target-setting guidance (portfolio-, sub-portfolio and/or sector-level) as well as SBTi FINZ long-term emissions reductions, maintenance and portfolio neutralisation targets.

- **Portfolio alignment targets** relate to increasing the share of financial flows towards financial assets that share a common set of characteristics, usually denoting the alignment status of the financial asset. The characteristics taken into account may vary, as well as the metric used and the type of alignment status targeted (net zero, aligned, aligning...). Portfolio alignment targets can be set using "input (capital deployed)" or "normative alignment output" metrics.
    - Input metrics measure financial flows to financial assets that exhibit different attribute(s) in relation to the transition, such as presence of a validated science-based target or of a credible and robust transition plan.
    - Output metrics focus on the alignment outcome to be attained, expressed for example by the Implied Temperature Rise of a portfolio[11].

These include the SBTI portfolio coverage and Implied Temperature Rise targets, the SBTi FINZ alignment targets, and the PAII financial asset-level targets based on the maturity scale as described in the NZIF.

- **Financing targets** are a specific type of portfolio alignment targets using capital deployed metrics. They focus on the activities directly financed through project finance and other asset classes with known use of proceeds, i.e. the individual projects of business activities, or indirectly financed through general purpose investments. Financing targets usually focus on ceasing or decreasing fossil fuel finance, and increasing financial flows to climate solutions[12].

These include the climate solutions & fossil fuel exposure targets that are mentioned/recommended/ mentioned in the NZAOA, NZBA, PAII NZIF and SBTi FI target-setting guidance.

Notably, a number of tools exist to support financial institutions devising sectoral policies, such as fossil fuel policies (Coal policy tracker; Oil & Gas policy tracker).

While all alignment frameworks and guidance refer to portfolio emissions targets, recently we observe an increased emphasis on portfolio alignment targets. These targets relate to 1. increasing financial flows to financial assets and activities that share specific desirable attributes in relation to net zero and 2. decreasing the share of financial flows to financial assets and activities that are not compatible with the transition. Financing targets can be seen as a subset of portfolio alignment targets.

9 We focus on climate performance targets - other types of targets, such as engagement, lobbying or product introduction targets are excluded from the detailed review.

10 These targets take the form (illustrative only): *"decrease financed emissions by 50% to 2030 from 2020 levels"*

11 Alignment targets set using input (or capital deployed) metrics take the form (illustrative only): *"Increase share of financial flows to net zero or aligned financial assets to 30% by 2030"*. Alignment targets set using normative alignment metrics take the form *"Decrease portfolio alignment Implied Temperature Rise score to 1.5°C by 2050"*

12 Financing targets take the form (illustrative only): *"Increase kWh of renewable energy financed by 20% by 2025", "Cease financing of new fossil fuel projects by 2025", "Increase financing to climate solutions by 10% by 2025"*.

Increasingly, portfolio alignment targets (including financing targets are seen as the "primary" type of targets that should be set. For example, SBTi highlights that these targets should be seen as "leading" indicators where portfolio emissions' targets and metrics should be seen as "lagging" indicators (SBTi FINZ, 223).

Indeed, portfolio alignment targets appear to be better suited to support the wide range of transition strategies that financial institutions can follow in aligning their activities to the net zero planetary objective. In particular, they make it possible, in the short-run, to invest in highly-emissive financial assets particularly relevant to the transition.

Portfolio emissions targets are better suited to monitor the long-term outcome of financial institutions' strategies and act as an accountability mechanism to ensure that the reorientation of financial flows leads to the right level, in terms of pace and scale, of portfolio emissions reduction.

Consequently, portfolio alignment and emissions targets are theoretically complementary. In the short term, portfolio emissions could increase as financial institutions deploy transition finance strategies such as investing in emissions-intensive financial assets that are transitioning. But over the medium to long-run, as financial assets transition to ultimately reach their net zero level, portfolio emissions should mechanically decrease to a level near net zero by 25.

The need to set a range of different complementary targets is increasingly recognized by the market (Reclaim Finance, 2023) and in target-setting guidance/protocols/standards. For example, the SBTi FINZ, NZAOA and PAII NZIF target-setting guidance require a mix of targets. These guidelines are apparent when reviewing the current reporting of financial institutions. Most asset managers and asset owners set both portfolio emissions and alignment targets. This is less the case for banks, which might be explained by the current emphasis of the NZBA target-setting guidance on sector-level decarbonization targets. Still, an increasing number of banks are taking financing targets in addition to decarbonization targets.

Some of the challenges are 1. how to classify financial assets into alignment categories (see next section) and 2. how to link portfolio alignment targets to the global macro budget and decarbonization. Approaches are emerging to translate portfolio alignment targets into projected portfolio emissions' change, thereby linking the two (GFANZ, 2023). Yet, this may prove quite challenging to do. For financial institutions themselves, it may require a lot of time and resources. For external stakeholders, it may require information on alignment targets that is seldom available and diverges across actors, which use a wide range of "alignment" definitions and criteria to assess alignment.

For additional details and data, see parts 2.2 and 2.3.

2.2 Portfolio alignment assessments and alignment strategies

Portfolio (and financial asset) alignment assessments consist of methodologies that aim to assess the "alignment", or "compatibility" or "consistency" of financial assets and/or portfolios with (a) given pathway(s) that limits global temperature rise under a specific level with a certain probability.

The results of alignment assessments can be used by financial institutions:

- **As an input metric for target-setting purposes, when setting portfolio alignment targets** (see parts 2.2 and 2.3)**;**
- **To monitor (and communicate) progress against pre-set targets (including portfolio emissions and alignment targets);**
- **As a tool to support appropriate decision-making in relation to the net zero objective, such as identifying financial assets on which to focus engagement or include within aligned portfolio products.**

Historically, portfolio (and financial asset) alignment assessment methodologies have been categorised based on their focus (emissions, activity, and more recently transition-plan alignment) and output metric (binary, divergence/convergence, maturity scale, implied temperature rise and scores).

Examples of methodologies focussing on emissions' alignment include the CDP-WWF Temperature rating or the Transition Pathway Initiative Carbon Performance score. An example of methodology focussing on activity alignment is PACTA. Finally, ACT methodologies assess transition plan alignment. Table 1 in the Summary cartography p.15 and classifies the methodologies reviewed as part of this report.

The increased focus on transition finance yields the question of whether and how alignment assessments can be used to build, support and monitor transition strategies and their associated results. Answering thisquestion requires developing a novel categorisation system based on what "counts" as alignment within these methodologies.

Transition finance strategies and the composition of portfolios need to change through time – in the short-run, the main focus of financial institutions may be to increase the share of financial assets with aligned targets and/or performance – while in the longer-run, the focus must shift to increasing the share of financial assets that have already achieved their net zero level.

No consensus currently exists on how to 1. Map the different categories of alignment, 2. Determine the attributes a financial asset should exhibit to be classified into one category and 3. assess financial assets against these attributes. Work is nascent but rapidly evolving in that field (WBA, 2023; CBI, 2023; GFANZ, 2023).

For example, the SBTi (2023), PAII NZIF (2021), Climate Bonds Initiative (CBI), GFANZ (2023) and the Sustainable Markets Initiative's Asset Manager and Asset Owner Task Force (SMI AMAO) have developed frameworks which include a classification of alignment categories, attributes for financial assets to be classified in each of the categories and, to a lesser extent, guidance on how to assess attributes.

Different alignment methodologies attribute a rating of "aligned", or "1.5°C" (or equivalent depending on the metric used) to financial assets that fall within different categories of alignment, because they rely on different definitions of what counts as alignment. For example, financial assets are rated "aligned" or "1.5°C" in certain methodologies because they have an "aligned" target, whereas in others the financial assets' other aspects such as past and current performance, management framework, engagement strategy also contribute to the alignment assessment.

Alignment methodologies that integrate multiple criteria relating to a financial asset's transition plan and journey, and result in a maturity-dependent output, can be used directly to classify financial assets within different categories of alignment, at least in theory, as long as the methodology is transparent and properly understood by the user.

But other alignment methodologies are not framed using the idea of "categories of alignment".

Consequently, their outputs can be difficult to interpret and send misleading messages, as a range of elements are summarised into a unique alignment indicator and their effect on the final result cannot be disentangled. This is the case of most ITR metrics, for example. This is not necessarily an issue linked with the methodologies and outputs themselves, but rather how the results are presented. It usually requires additional work and information for the outputs of alignment assessment methodologies to be used to evaluate specific attributes necessary to classify financial assets within different categories.

For additional details and data, see parts 2.4 and 2.5.

3. THE INGREDIENTS - DEEP-DIVE INTO KEY DESIGN QUESTIONS AT PORTFOLIO-LEVEL RELEVANT FOR CONSOLIDATED ALIGNMENT ASSESSMENTS

This part identifies and deep-dives into some of the *"systemically-important choices"* that can be made when designing portfolio and financial asset-level alignment methodologies (either as standalone or feeding into wider FI-level transition plan alignment assessments), both target-setting and alignment assessments.

The range of possible design choices that can be made in portfolio alignment methodologies, their convergence and divergence, were first detailed in the Alignment Cookbook (ILB, 2020) and the reports of the GFANZ Portfolio Alignment Measurement workstream[13] (PAT, 2020; PAT, 2021; GFANZ, 2022). Subsequent research, including reports from INFRAS and the OECD, reviewed design choices and available methodologies, using broadly similar classifications (INFRAS, 2022; OECD, 2022).

13 Previously the TCFD Portfolio Alignment Team.

All the design choices are important as they can create different sets of (mis)appropriate incentives at the micro-level (INFRAS, 2022). At the aggregate-level, these can raise additional questions.

The Alignment Cookbook showed the large variability in alignment results at portfolio- and company-level when applying different alignment assessment methodologies. Later, other research reached the same conclusions, on larger samples of portfolios and companies (INFRAS, 2022; OECD, 2022).

Given that existing portfolio alignment assessment methodologies differ on a wide range of design choices, these reports were not able to identify with certainty the source(s) of the discrepancies, let alone test for the sensitivity of the results to different design choices, everything else being equal.

The concept of "systemically-important design choices" is introduced to designate these design choices *that are particularly relevant from a consolidated alignment perspective. Relevance is defined across two theoretical axis:*

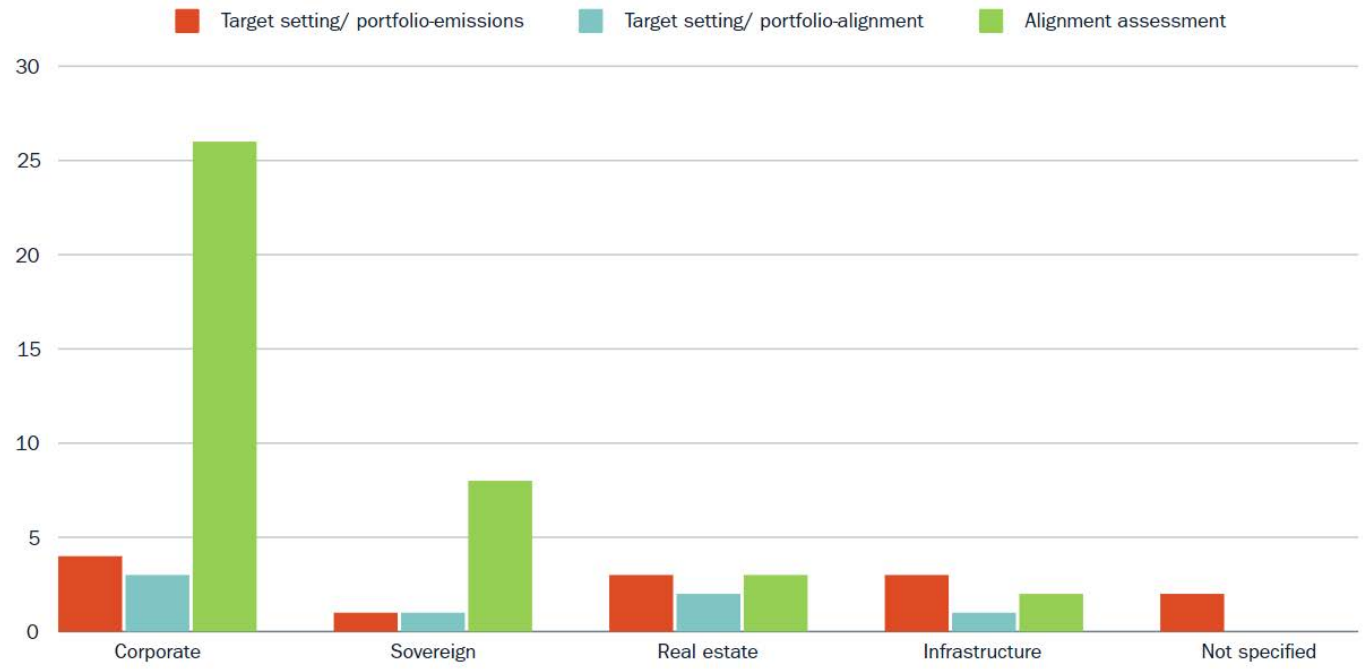
1. **Design choices that lead to large variations in the results at all levels, and increase the higher the aggregation level.**
2. **Design choices that matter from a scientific robustness perspective, regarding the link between alignment performance and the respect of the remaining global carbon budget.**

We identify three overarching systemically-important choices.

Systemically-important choice 1: Incorporating considerations relative to perimeter and coverage, in terms of financial activities, asset classes, sectors within these activities and proportion of financial assets within these asset classes and/or sectors, parts of the portfolio's assets value chain (Scope 1, 2 and/or 3) and types of GHGs.

While a lower coverage can, at the micro-level, be useful for using the results to drive targeted action and (attempt) to maximise data quality in a context where data and methodologies are not available for all financial activities and asset classes, at the macro-level it may create blind spots, that, if not appropriately managed, may lead the users of the results to reach misleading conclusions and take misguided actions on the basis of partial information.

Figure 1: number of methodologies reviewed in this report per asset class (See "Detailed review of Alignment methodologies" for more details)

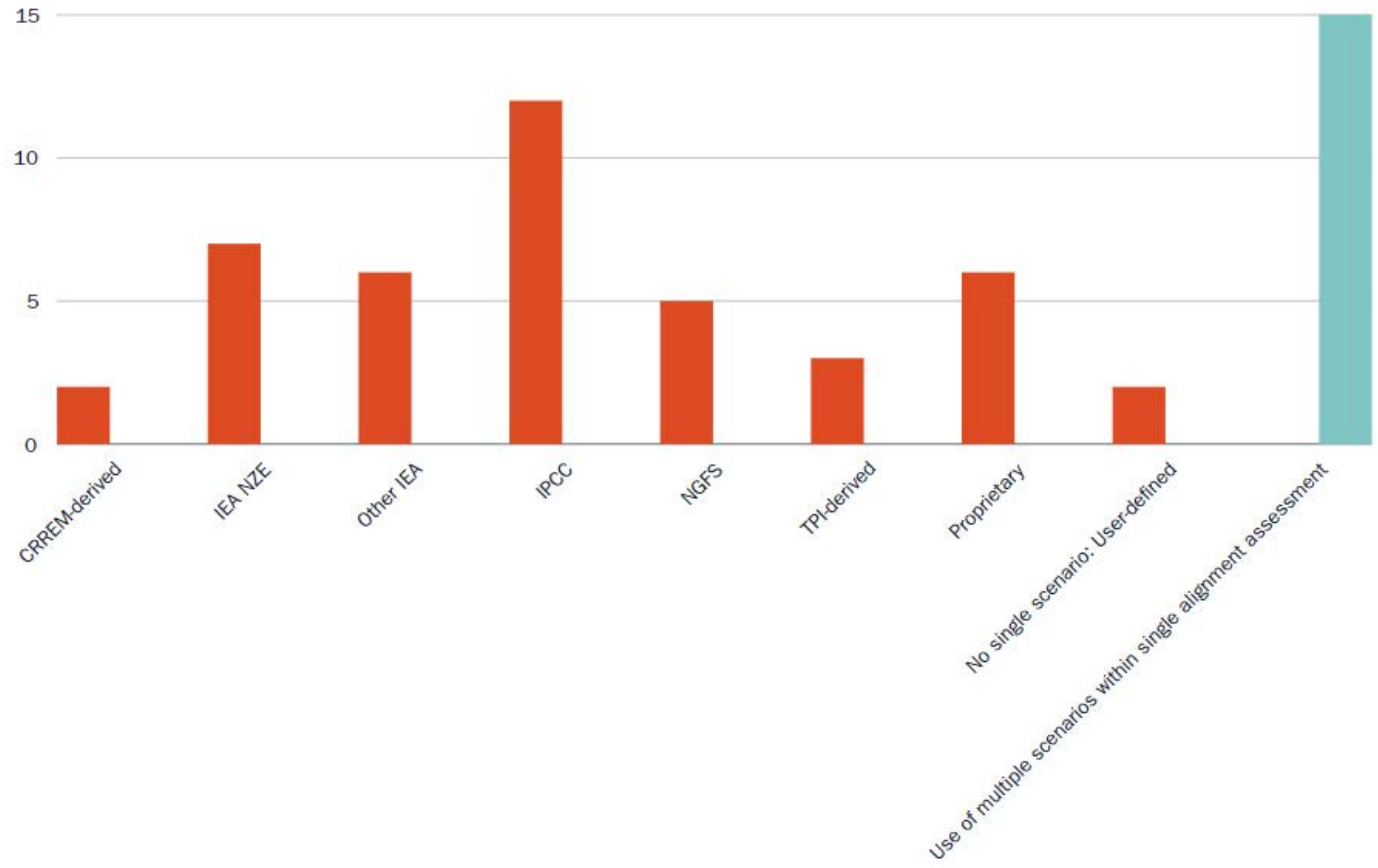


For additional details and data, see part 3.2.

Systemically-important choice 2: Building and using alignment benchmarks, in particular choosing the underlying scenario(s) and pathway(s), adapting them so that they are suited to be used in an alignment methodology and allocating the global, sector and/or geographic pathways to the different micro-level economic players and portfolios.

These hypotheses differ across, and sometimes within, alignment methodologies, meaning that in practice, alignment methodologies may share out different global decarbonization burden (=choice of scenario) based on different principles (=choice of allocation approach). Where this is the case and not adequately-managed, an alignment assessment methodology may reward financial assets, portfolios and by extension groups of financial institutions that overshoot their consolidated budget.

Figure 2: number of methodologies reviewed in this report that use the following scenarios



For additional details and data, see part 3.3.

Systemically-important choice 3: Aggregating, in particular choosing the level of aggregation at which to set targets and assess alignment, as well as the aggregation approach.

The topic of aggregation is, by definition, transversal and raises significant questions, such as how to maximise robustness from a scientific perspective and make sure the aggregated metric is meaningful and fit to drive appropriate action. A range of aggregation approaches exist, each with pros and cons in terms of applicability and robustness, in particular relating to the above two themes, avoiding blind spots and respecting the macro budget.

Approaches set at a higher aggregation level allows to target the activities, asset classes and sectors that are most relevant to the financial institution or group of financial institutions under consideration. Yet, if no appropriate checks are in place, an alignment assessment methodology can reward financial institutions and by extension groups of financial institutions that are shifting their financial flows from most relevant to least relevant activities, asset classes and/or sectors from a transition perspective, increasing the risk of "paper decarbonization" and macro-budget overshoot.

For additional details and data, see part 3.4.

A SUMMARY CARTOGRAPHY OF EXISTING ALIGNMENT METHODOLOGIES

This report reviews the range of existing frameworks, methodologies and tools that exist to assess the *alignment* of financial institutions, portfolios and financial assets ("micro-level"). **Understanding the type and structure of existing alignment methodologies at the micro-level is useful to inform: 1. whether specific types of alignment methodologies and design principles are more desirable than others to assess the consolidated alignment of a group of institutions, and 2. whether the results of existing methodologies can be reconciled and fed into such an assessment.**

The concept of "alignment" has been applied to different objects, entities but also portfolios, financial flows, activities, transition plans, targets, performance, sometimes interchangeably or as proxies for one another.

This review shows that alignment methodologies:

- Operate at three interrelated levels (from the financial sector perspective): FI-level, considering FI transition plans and approach to net zero; portfolio-level; and financial asset-level (including FI as counterparties).
- Vary in terms of input data, design choices, output data, and what implicit definition of alignment they capture.

Table 1: A detailed cartography of alignment methodologies. The cartography is developed as part of this review and does not reflect the view of the mentioned methodology developers.

Alignment methodology type	Alignment methodology sub-type	Examples (non-exhaustive)
FI-level transition plan alignment[14] Assess a financial institution's progress along its alignment journey, its global approach to net zero and the quality of its transition plan as a whole, including the presence and adequacy of net zero targets and the strategic and organisational means put in place to achieve them.	**Qualitative evaluation of FI alignment approach:** rate how transparent complete and adequate financial institutions' transition plans and broader disclosures are, across a number of required dimensions, such as governance, targets, strategy, actions taken.	• Observatoire de la Finance Durable Net Zero Analysis (OFD) • CDP assessments of Climate Transition Plans (CDP, 2023) • WWF Red Flag indicators' framework (WWF, 2023) • Climate Policy Initiative Net Zero Finance Tracker (CPI) • TPI Banking Tool Management Quality module (TPI) • Reclaim Finance Red Flag indicators (Reclaim Finance, 2024)
	Qualitative evaluation of FI alignment approach that includes (a) quantitative portfolio alignment assessment(s) (current, projected and/or targeted): in addition to the above, includes an evaluation of financial institutions' alignment of targets' and/or portfolio climate performance with trajectories commensurate with the net zero objective, beyond what is being disclosed.	• CDP NZAD dataset (including CDP assessments of Climate Transition Plans) (CDP, CDP, 2023) • ACT Finance (ACT) • FinanceMap (by InfluenceMap) (InfluenceMap, 2022) • TPI Banking Tool Carbon performance (quantitative) and Management Quality (qualitative) module (TPI) ACT Finance is the only approach that results in an aggregated assessment at FI-level taking into account both qualitative and quantitative considerations in an overarching rating scheme.

14 These methodologies are called FI Transition Plan Alignment assessments as usually presented in the literature but refer to Fi's approach to net zero as a whole, rather than their specific transition plans.

Portfolio target-setting methodologies[15] Used by financial institutions to set their targets and/or third-parties to derive normative alignment benchmarks to assess financial institutions' targets.	**Portfolio emissions target-setting** focuses primarily on the emissions associated with financial flows. They can focus on emissions reduction or carbon removals, be based on a range of metrics (absolute, intensity), apply at different-level of aggregation (sector, asset-class, activity, portfolio) and leverage different financial asset-to–aggregated level aggregation methodologies (ownership-based, weighted averages).	• PAII NZIF, NZAOA, NZBA emissions reduction targets (portfolio-wide, sub-portfolio-wide and/or sector-level)(PAII 2021/2024); NZAOA, 2024; NZBA, 2024). • SBTI FINZ long term emissions reduction, maintenance, and portfolio neutralisation targets (SBTi). • Emissions targets as detailed/recommended in GFANZ and other alignment frameworks such as the HLEG (GFANZ, 2022; HLEG, 2022).
	Portfolio alignment target-setting[16] relates to increasing the share of financial flows towards financial assets that share a common set of characteristics, usually denoting the alignment status of the financial asset. ***These are built on portfolio- and/or financial asset-level alignment assessments (see below).***	• PAII asset-level targets based on the NZIF or other maturity scale approach (PAII, 2021/2024). • SBTi FINZ alignment-based targets (SBTi). • SBTi portfolio coverage and temperature targets (SBTi). • Targets and metrics on GZANZ aligned, aligning and managed phase-out transition strategies to support real-economy transition (GFANZ, 2022).
	Financing target-setting[17] focuses on the activities directly financed through project finance and other asset classes with known use of proceeds, i.e. the individual projects of business activities, or indirectly financed through general purpose investments. Financing targets usually focus on ceasing or decreasing fossil fuel finance, and increasing financial flows to climate solutions.	• Climate solutions & fossil fuel exposure targets that are mentioned/recommended/mentioned in NZAOA, NZBA, PAII NZIF and SBTi FI (NZAOA, 2024; NZBA, 2024; PAII, 2021/2024; SBTi). • Targets and metrics on GFANZ climate solutions (GFANZ, 2022). • Financing-based targets, notably on climate solutions and fossil fuels, are also mentioned in multiple alignment frameworks.

15 We focus on climate performance targets - other types of targets, such as engagement, lobbying or product introduction targets are excluded from the detailed review.
16 Also called portfolio allocation or portfolio composition targets
17 Can be seen as a sub-type of portfolio alignment targets.

<table>
<tr>
<td rowspan="3">Portfolio alignment assessment methods

Build on financial asset-level data and comprise an asset to portfolio aggregation method.

Results feed into target-setting, monitoring or decision-making.</td>
<td>Emissions-alignment methodologies focus on past, current and/or projected emissions alignment.</td>
<td>Portfolio & financial asset-level:
Corporate: CDP-WWF NZAD/Temperature Rating, Ethos Temperature Score, FTSE Russell Implied Temperature Rise Score (Corporates), ICE Climate Transition Analytics (formerly Urgentem Element6 Platform), Iceberg Datalab SB2A - Corporates, Impact Cubed Temperature score, Moody's Temperature Alignment Data, MSCI Corporate ITR (new release, 2024), Ortec Finance ClimateALIGN Corporates, Planetrics Pathways temperature score, Planetrics Budget temperature score, S&P Global Trucost Paris Alignment Assessment
Sovereign: Iceberg Datalab SB2A - Sovereigns, Ortec Finance ClimateALIGN Sovereigns, Planetrics Sovereign
Infrastructure: C4F CIARA
Real estate: Ortec Finance ClimateALIGN Real estate
Financial asset-level only:
Corporate: CDP NZAD/SDA supplement, CDP NZAD/Trend score[18], TPI Carbon performance score (corporates)[19]
Sovereign: FTSE Russell Sovereign CLAIM-based Temperature scores (Net zero target, NDC and current scenario)
Real estate: Carbon Risk Real Estate Monitor[20]</td>
</tr>
<tr>
<td>Activity-alignment methodologies focus on past, current and/or projected activity alignment, using for example such as green brown or taxonomic shares, captured through revenue, production, or other metrics. This is the equivalent of GFANZ transition-based metrics. Technology-alignment is a special form of activity-alignment.</td>
<td>Portfolio & financial asset-level:
Corporate: PACTA (RMI) for Banks and Investors, Sustainable Platform Funds Alignment with Climate scenarios
Financial asset-level only:
Corporate: Carbon Risk Real Estate Monitor energy intensity alignment, NEC Score
Sovereign: NEC Score</td>
</tr>
<tr>
<td>Transition-plan alignment methodologies[21] focus on the quality of a financial asset's transition plan and global approach to net zero. These methodologies usually rely on a range of criteria, at least one of which is often assessed using emissions-alignment (e.g. assessing decarbonization target's alignment) or activity-alignment methodologies[22] (e.g. assessing CAPEX alignment).</td>
<td>Portfolio & financial asset-level:
Corporate: C4F CIA (corporates), Clarity AI Net Zero Alignment
Sovereign: C4F CIA (sovereigns)
Financial asset-level only:
Corporate: ACT sector methodologies, CA100+ Benchmark, Moody's Net Zero Assessments
Sovereign: ASCOR, Germanwatch & NewClimate Institute Climate Change Performance Index
ISS ESG Net Zero Alignment Status can be seen as a transition-plan alignment methodology but does not integrate (yet) an alignment assessment component.

Ethos Temperature Score and MSCI Corporate ITR (new release, 2024) integrate transition plan elements into emissions' projections.</td>
</tr>
</table>

18 When used together with the CDP-WWF NZAD/Temperature Rating, can be seen as a transition-plan alignment assessment methodology.
19 When used together with the TPI Management Quality score, can be seen as a transition-plan alignment assessment methodology.
20 The CRREM tool includes both an emissions-based and "activity-based" (energy intensity) component.
21 These methodologies are called Transition Plan Alignment assessments as usually presented in the literature but refer to entities' approach to net zero as a whole, rather than their specific transition plans.
22 All transition plan alignment methodologies do not include emissions- or activity-alignment sub-criteria. By definition, we include in our review only those who do.

READERS' GUIDE

The Menu: Navigating an increasingly-complex net zero ecosystem

This part defines the key concepts relating to alignment at different levels, from the planetary objectives embedded in the Paris Agreement to alignment at non-state entity-level (including financial institutions) and portfolios. It then provides an overview of the ecosystem of alignment tools developed for and used by financial institutions, from alignment frameworks to specific methodologies and metrics.

- What does alignment mean for a non-state entity?
- Is it, and how, linked to the entity's contribution to the global goals and impact?
- What is the difference between alignment frameworks, methodologies and tools?
- How do alignment methodologies fit within the wider climate-related methodologies and metrics' landscape?
- What is the difference between FI-level alignment assessments and portfolio-level assessments?
- What can alignment metrics be used for?
- What are their limitations, in particular in the context of developing a consolidated alignment assessment?

The Recipes: Deep-dives into portfolio-alignment methodologies

This part maps and classifies into high-level families the existing target-setting and alignment assessment methodologies based on their focus, and how they can be used by financial institutions in their strategies.

- What is transition finance?
- What are the different types of targets financial institutions set and how?
- How can portfolio emissions and portfolio alignment targets be reconciled, in particular in light of the increased emphasis on transition finance?
- What are the recommendations/requirements of the different target-setting guidance, protocols and standards regarding target types and mix?
- What are the different types of alignment assessments?
- Can alignment assessments feed into transition finance strategies?
- How can the results of alignment assessments be made more relevant for their use in transition finance strategies?

The Ingredients: Deep-dives into systemically-important design choices

This part identifies and deep-dives into some of the "systemically-important choices" that can be made when designing alignment methodologies, both target-setting and alignment assessments.

- Are some of the design choices identified in prior research more important than others in light of the consolidation challenge?
- Which of these choices are more common than others in target-setting and alignment assessment methodologies?

Detailed review of alignment

THE MENU - NAVIGATING AN INCREASINGLY-COMPLEX NET ZERO ECOSYSTEM

In this section, the transition from the net-zero objective at the planetary level as outlined in the Paris Agreement to the alignment efforts at the non-state entity level is discussed, focusing on businesses and financial institutions, alongside the various frameworks, methodologies, tools and metrics employed in the process.

Why is it important?

The theme of "alignment", especially applied to the financial sector, is very dynamic and sometimes prone to confusion.

Published research has so far focussed on specific topics, such as alignment frameworks, transition plans, target-setting or alignment assessment methodologies. There is a need to understand how these fit together in a holistic picture to make good use of all the resources available in that field.

At the planetary level, the goal is to achieve net zero by balancing anthropogenic emissions with removals. Businesses and financial institutions cannot *be* "net zero" strictly speaking, but rather they can contribute in reaching the collective objective of net zero.

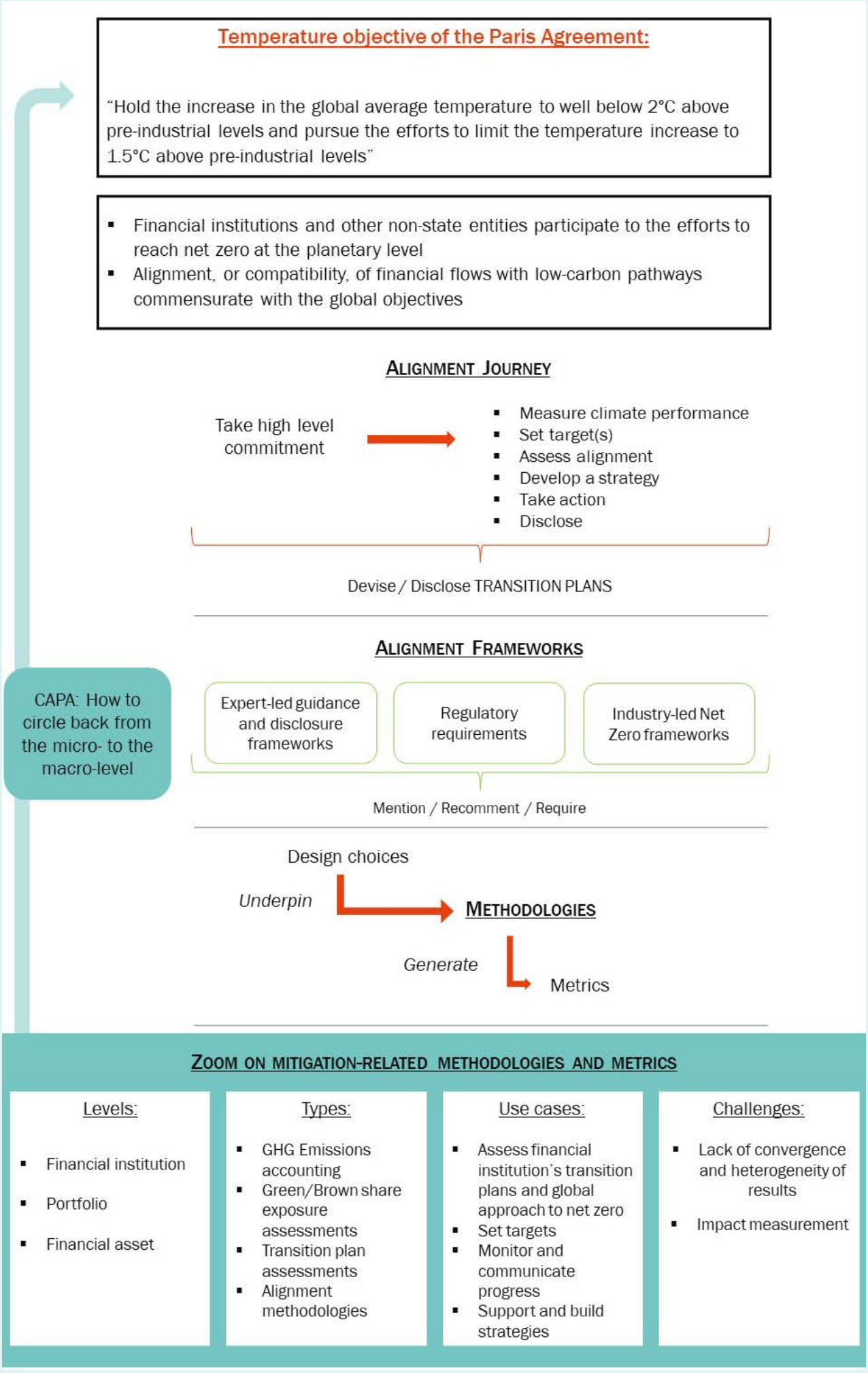
The indirect, yet crucial and unique role that financial institutions can play in the global effort to reach net zero at the planetary level is recognized in the Paris Agreement. In particular, Article 2.1c states the objective to "[make] financial flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development".

It is important to highlight that (i) this objective is meaningful to the extent that relevant transitioning financial assets to be financed actually emerge at a sufficient scale and that (ii) financial institutions are one of the main but not the only contributors to this objective, as there are other financial channels[23].

Since the Paris Agreement, the topic of "alignment" has taken centre stage in climate-related finance. An increasing number of public and private actors and coalitions are working to guide the financial sector in contributing to the global goals, to act as a compass and create a critical mass of financial institutions taking action. Together, they outline what financial institutions can do to align their activities and actions and contribute to the planetary objective. In parallel, a broad range of methodologies and metrics have been developed in the process to support financial institutions.

23 According to McKinsey, 2023, the contribution of private investments is estimated to be a slightly higher half of the global needs.

Figure 3: Part 1 summary



1.1 Defining alignment: from the planetary objective to the role of financial institutions

1.1.1 Net zero: an objective at the planetary level

The **2015 Paris Agreement** set the globally-recognized objective of "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue the efforts to limit the temperature increase to 1.5°C above pre-industrial levels" in its article 2.1.a.

To do so, scientists agree that carbon dioxide emissions need to be halved by 2030 and reach net zero by 2050, together with deep cuts in other greenhouse gases emissions, in the **IPCC special report on 1.5°C** (IPCC, 2018).

Net zero designates the state to be reached at planetary level, where "anthropogenic emissions to the atmosphere are balanced by anthropogenic removals over a specific period".

Because it is unlikely that emissions can be decreased completely to (gross) zero[24], the concept of carbon removals is introduced, with the term "net" emissions. Removals can take the form of biological or technical sequestration.

While there is an internationally agreed-upon and scientific understanding of the concept of net-zero at the planetary level, it is less clear how this concept should translate at the non-state entity level, particularly for businesses and financial institutions. Nevertheless, a consensus seems to be emerging on several elements.

First, businesses and financial institutions cannot *be* "net zero" strictly speaking, but they can rather contribute to **the collective objective of reaching net zero at the planetary level. This puts an emphasis on action and highlights that the level and type of effort needed may be different from one entity to another** depending on its capacity and responsibility.

Second, all recently published definitions of what it means for businesses and financial institutions to contribute to the net zero objective (HLEG, 2022; SBTi, 2020; SBTi, 2022; ADEME, 2021) mention at least two complementary dimensions, namely:

1. The drastic and rapid reduction of GHG emissions through the prioritisation of mitigation efforts.
2. The voluntary contribution to the increase of the volume of carbon removals at global level, to neutralise a limited volume of residual emissions once all mitigation efforts have been pursued.
3. In relation to point 2, relevant actors should act as a global sink, i.e. not only reducing emissions but also guaranteeing negative emissions at planetary-level.

The remaining global carbon budget

The accumulation of GHG emissions in the atmosphere leads to global temperature increase.

The remaining carbon budget for a given level of global average temperature is the quantity of carbon which can be emitted in the atmosphere without exceeding the globally targeted temperature increase, according to scientific research.

Given uncertainty in climate response to carbon emissions, the link between the quantity of carbon in the atmosphere and temperature increase is expressed with different probability levels.

The remaining global carbon budget is usually expressed in gigatons of carbon. Researchers use the global remaining carbon budget to derive transition scenarios that explore how emissions can be reduced through time while remaining within budget under certain constraints.

For example, the IPCC special report on 1.5°C distributes the remaining budget through time along decarbonization and carbon removal pathways, and finds that carbon dioxide emissions need to be halved by 2030 and reach net zero by 2050, together with deep cuts in other greenhouse gases emissions (IPCC, 2018).

24 Only 4 of the 42 trajectories that limit global warming to 1.5°C with limited or no overshoot in the IPCC Special report on 1.5°C (IPCC, 2018) avoid the use of carbon removal at scale. These rely on a significant reduction in energy and food demand that appear unlikely. For all other trajectories, approximately 1 ton of carbon should be removed for 1 ton of carbon emitted throughout the century (ILB, 2020).

1.1.2 Alignment at the non-financial entity-level

The concept of alignment emerged in response to the objectives of the 2015 Paris Agreement, through phrases such as "alignment with the Paris Agreement", "alignment with low carbon pathways", or "net zero alignment".

At its simplest level, "alignment" refers to the consistency or compatibility of an entity's climate performance, expressed through a variety of metrics, with pathway(s) commensurate with the net zero planetary objective.

1. Designating the "adequate" level of decarbonization effort required for entities relies on downscaling the remaining carbon budget and associated mitigation pathways established by the scientific community at the entity-level. All entities need to reduce their GHG emissions at a rate and scale sufficient for the world to decarbonize along science-based mitigation pathways, thereby respecting their "fair" share of the global carbon budget. The issue remains to determine the appropriate rate and scale at entity-level. This is called "allocation" and the result is alignment benchmarks. Allocation exercise often relies on assumptions such as (i) linear reductions of efforts vs. more realistic in reality "step-by-step" trajectory through the implementation of different levers and (ii) arithmetic allocation of efforts among financial assets, whatever concrete levers have been - or haven't been - already implemented.
2. In theory, all entities need to increase carbon removals at a rate and scale sufficient for the world to remain within its carbon budget and aligned with science-based net zero pathways. At the moment, no consensual approach exists to allocate the carbon removal effort required globally to individual entities, therefore "adequate" participation is seldom defined through a rate using pathways as for carbon mitigation (SBTi, 2023). Where defined quantitatively, it most often takes the form of neutralising ones' residual emissions to reach net zero. As a consequence, the primary, short-term focus is most often put on alignment with decarbonization pathways.

Two common confusions on entity-level alignment

As discussed in the Alignment Cookbook, "alignment with low carbon pathways (e.g. well below 2°C or 1.5°C)"; "alignment with the Paris Agreement"; and "net zero alignment" is often used interchangeably but there are important differences between these concepts (ILB, 2020).

- "Alignment with low-carbon pathways" refers to any mitigation pathway that is associated with the well below 2°C, or 1.5°C temperature rise objective. Usually, entities refer to this type of alignment, even when using the terms "net zero" or "Paris alignment".
- "Net zero alignment" necessarily captures both the carbon mitigation and removal challenge.
- While the Paris Agreement refers to compatibility with low carbon pathways that lead to well below 2°C or 1.5°C temperature outcomes, there is an infinite number of trajectories that exist to limit temperature rise below 2°C or 1.5°C. The Paris Agreement provides hints on the principles that the desired trajectory should support, beyond the temperature objective itself, by including objectives related to adaptation, climate-resilient development and the just transition.

The concept of alignment is sometimes used as a semantic shortcut to designate the extent to which a non-state entity contributes to the global efforts needed to reach the net zero at planetary level. Yet, research shows that consistency or compatibility with low-carbon pathways is *not* to be confused with contribution and real-world decarbonization impact (ILB, 2020).

For example, an entity's own decarbonization may not necessarily lead to a reduction of greenhouse gas emissions on the aggregate. The entity may decrease its emissions and improve its climate performance by simply selling carbon-intensive physical assets and activities, thereby leading to a reallocation of emissions rather than a reduction at macro-level.

Taking the example of the power sector, the 2° Investing Initiative shows that decarbonization may be achieved either through virtual or real changes. Virtual changes include buying already-existing green power generation capacity or selling carbon-intensive capacity. Real changes, on the other hand, include building new green generation capacity, closing and/or ramping down carbon-intensive capacity (2° Investing Initiative, 2022). At state-level, the risk of "carbon leakages" is a recurring theme, notably in discussions around market-based instruments to mitigate climate change.

Assessing an entities' contribution involves understanding whether the actions taken to align climate performance resulted in virtual or real changes at the macro-level. The latter is the definition of impact.

1.1.3 The role of financial institutions

While financial institutions are not the direct "emitters" of large quantities of GHGs, it is increasingly recognized that **finance can play a crucial role of financier and enabler**, by using its influence to "align incentives and eliminate barriers to emissions reductions for solution developers and carbon-intensive asset (SBTi, 2022)".

The indirect, yet crucial and unique role that financial institutions can play in the global effort to reach net zero at the planetary level is recognized in the Paris Agreement. In particular, Article 2.1c states the objective to **"[make] financial flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development"**.

As discussed above, consistency does not necessarily mean contribution and impact. As put by 2° Investing Initiative, "while alignment is a valuable strategy, its effectiveness in causing decarbonization in the real economy is debatable and conditional" (2° Investing Initiative, 2021).

- At the non-financial entity level, increased compatibility, or "alignment" of financial flows with pathways commensurate to the net zero objective, can be achieved through virtual changes (see the discussion above).
- There is a second layer of potential "virtual changes" for financial institutions. For example, the emissions associated with financial portfolios may be decreased by simply selling unaligned financial assets to other investors and replacing them with aligned financial assets in one's portfolio. This type of rebalancing is unlikely to create any real impact.
- It is useful to distinguish between the impact of financial institutions and the impact of companies in the real economy. Kölbel et al. (2020) underlines that financial institutions' impact is defined through the concept of "additionality", or the idea that an investor can provoke either an increase of the company impact or a qualitative improvement of the company impact[25].

Therefore, it is necessary to distinguish between alignment at portfolio-, or financial flow level and alignment at entity-level. "Aligning the activities of a financial institutions" can be understood as the process at both the strategic and operational levels by which financial institutions:

1. Reorient their financial flows towards activities "consistent" with the global climate goals;
2. Scale up consistent decarbonization activities in line with the required speed and volume established by climate science;
3. Lower their financial support toward fossil fuel sectors, accompanying and anticipating the necessary decrease of fossil fuel productions and stopping new extraction capacities.

Financial institutions' contribution refers to the "actions that intend to generate positive impact on climate goals" (I4CE, 2021). It is defined as part of an institution's alignment target and strategy, which respectively define the institution's level of ambition and how it aims to achieve it over time.

Financial institutions' impact mechanisms

As shown in Kölbel et al. (2020), there is varying degree of evidence in the literature of financial institution's levers, or investor impact mechanisms, leading to real world changes (figure 4). According to Kölbel et al. (2020):

- Empirical evidence exists on financial institutions' having an impact when active on private markets, through growing new/undersupplied capital markets, providing flexible capital and/or non-financial support to early-stage investments.
- There is some empirical evidence on the impact of shareholder engagement.
- Evidence is scarcer for public markets, particularly for investment/divestment type of levers, and remain model-based or at the narrative level. In theory, if a sufficiently-large number of institutions invest and divest from the same financial assets, this may lead to a change in the cost of capital, itself leading to changes in the financial asset's strategy and impact. This effect may vary depending on a range of factors, including the sector.

25 Causality effect is to date almost impossible to demonstrate, one issue among other being to "allocate" the same company's move between the various financial institutions that would claim to have taken action on the topic.

Notably, all these levers are not available to all types of financial institutions depending on their profile. **"Investment/divestment" and "engagement" are the main available levers to affect change for a wide range of market participants, in particular participants that operate on public markets and/or whose financial activities, such as insuring or underwriting, are likely to have less direct influence on emitters.** The success of engagement and investment/divestment for these actors to affect change rely, at least partly and in theory, on implementing these strategies together and reaching a **critical mass** of financial institutions taking action on the same objective.

Figure 4: Examples of investor impact mechanisms and level of evidence (I4CE-ILB, 2021, based on Kölbel et al. (2020)).

Investor Impact Mechanism		Type of change	Evidence Level	Requirements	Limitations	Typical asset classes
Grow new/ undersupplied capital markets		Enabling growth	B	• Investment in companies with net positive impact • Companies growth is limited by external financing conditions	• Not suited for investments in large, established companies, which have sufficient access ta external financing	Private markets
Provide flexible capital			B		• Not suited for companies that have sufficient access to philanthropic or commercial capital	
Engage actively	Provide non-financial support		B	• Investment in companies with net positive impact • Investors with know-how, reputation or network that helps companies grow faster	• Only suited for early-stage investments, where investors can directly influence the company	
	Shareholder engagement	Encouraging improvements	B	• Focus on meaningful improvements that companies can achleve at a reasonable cost • Investor with strong influence on a company	• Limited to incremental improvements; unlikely to transform industries	Public markets
Signal that impact matter	Market signals		C	• Transparent ESG criteria that companies can meet at reasonable cost • Substantial portion of the market screening out or underweighting firms that don't meet the criteria	• Only suited for early-stage investments, where investors can directly influence the company	
	Non-market signals	Growth or improvement	D	• High level of public visibility of the signal	• Impact is difficult to evaluate as it is indirect and depends on political action or cultural change	

Source: Driouich et al., 2021 building on research from Kölbel et al., 2020

A Scientific consensus; B Empirical evidence; C Model-based prediction; D Narrative.

1.2 Understanding the ecosystem of FI alignment tools: a panorama

1.2.1 Alignment at the financial institution level

Since the Paris Agreement, the topic of "alignment" has taken centre stage in climate investing. An increasing number of public and private actors and coalitions are working to guide the financial sector in contributing to the global goals, to act as a compass and create a critical mass of financial institutions taking action.

As embedded in their theory of change, these build up on social science research suggesting that the large-scale societal issues that any individual entity is targeting can be better achieved with a centralised infrastructure to develop a shared vision and framework for moving forward (Kania, John & Kramer, Mark., 2011). They create an unprecedented backbone support in the financial market, enabling a necessary first step toward collectively contributing to the net zero planetary objective.

Together, they outline what financial institutions can do to align their activities and actions and contribute to the planetary objective.

Financial institutions are typically advised to follow a number of steps along their alignment journey (PCAF, 2021; SBTi, 2023):

1. Take a high-level commitment;
2. Measure climate performance[26];
3. Set target(s);
4. Develop a strategy;
5. Take action;
6. Monitor;
7. Disclose.

Most often, the starting point is for financial institutions to make a high-level commitment regarding their contribution to the global efforts towards net zero at the planetary level. Steps 2-7 can be seen as supporting steps for financial institutions to meet their high-level commitments.

The process through which financial institutions plan their alignment journey is called "transition planning". A growing body of voluntary and regulatory frameworks encourage/require financial institutions to pursue an alignment journey, devise "transition plans", and report. They provide guidance on implementing the alignment journey in whole or in part.

One can differentiate between:

- **Expert-led and industry-led guidance frameworks,** for example, the UN-Convened High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities Integrity Matters report (HLEG, 2022).
- **Voluntary disclosure frameworks,** for example the TCFD Guidance on Metrics, Targets and Transition Plans or the UK Transition Plan Taskforce (TCFD, 2021; TPT, 2023). Notably, a number of expert- and industry-led guidance also include disclosure recommendations.
- **Regulatory requirements,** which outline expectations for financial institutions and businesses' disclosure on environmental, social and governance topics and increasingly include reporting requirements relating to alignment, target-setting and transition plans.

26 Called measuring of financed emissions in PCAF, 2021 and SBTi, 2023 - a wider definition for this technical element is used in this report to recognize that climate performance may be measured using a range of metrics in addition to financed emissions such as green-brown shares.

Table 2: Non-exhaustive examples of disclosure frameworks and guidance relating to net zero for financial institutions

Expert- and industry-led guidance
Climate policy Initiative Framework for Sustainable Finance Integrity (2021)
CSLN The good transition plan (2021)
GFANZ Financial Institution Net-zero Transition Plans – Fundamental, Recommendations, and Guidance (2022)
IIGCC PAII Net Zero Investment Framework (2021)
Race to zero: Interpretation Guide (2022), Criteria 3.0 (2022)
Science-based Target Initiative for Financial Institutions (2021)
UNEP FI Recommendations for Credible Net Zero Commitments from financial institutions (2022)
Reclaim Finance Red Flag Indicators for screening Climate Transition Plans (2024)
Various Net Zero initiatives guidance
WWF – Net Zero Transition Plans: Red Flag Indicators to Assess Inconsistencies and Greenwashing (2023)
Voluntary disclosure frameworks and regulatory requirements
Article 29 LEC (2021)
Capital Requirements Directive for banks
CDP Climate Technical Note: Financial Services Transition plans and Net Zero Commitments (2023)
IFRS ISSB
CSRD (2022) & ESRS (2022)
SFDR (2019)
Solvency II (2024)
TCFD – Guidance on Metrics, Targets, and Transition Plans (2021)
UK Transition Plan Taskforce: Disclosure Framework (2023), AM Sector Guidance (2023), AO Sector Guidance (2023), Banks Sector Guidance (2023).

Detailed comparisons are available in several publications, such as GFANZ work on "expectations for real-economy transition plans" (GFANZ, 2022) or the work of the ATP-CoI, Assessing Companies Transition Plans collective (WBA, 2023).

All these frameworks highlight that financial institutions need to take a high-level commitment and set specific time-bound targets, back the commitments and targets with robust plans and strategies, embed these into organisational processes and systems, monitor and disclose on progress.

When deep-diving into the specific guidelines, it becomes apparent that these frameworks differ, not only in terms of detailed content but also in terms of their levels of prescriptiveness and space for interpretation. This leads financial institutions to implement varying practices.

For example, the French Observatoire de la Finance Durable published in 2023 a "Net Zero Alliance Tracking Framework" and associated "Net Zero Donuts", comparing both Net Zero Alliances recommendations and French financial institutions net zero approaches to best practices, including the GFANZ and HLEG recommendations (OFD, 2023; GFANZ, 2022; HLEG, 2022).

Similarly, recent work from the OECD has shown that "frameworks put forward guidance on information, yet fewer metrics are clearly defined". It notes the wide variation in the range and type of metrics recommended in five frameworks[27], let alone the lack of explicit and converging guidance on calculation methodologies. This gives rise to varying practices by third-parties, "raising concerns in terms of both financial integrity and environmental integrity" (OECD, 2023).

27 • Institutional Investors Group on Climate Change (IIGCC, 2021) Net Zero Investment Framework Implementation Guide • Task Force on Climate-related Financial Disclosures (TCFD, 2021) report on Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures • UN-convened Net-Zero Asset Owner Alliance (NZAOA, 2023) Target Setting Protocol (Third Edition) • The Glasgow Financial Alliance for Net Zero (GFANZ, 2022) Recommendations and Guidance on Financial Institution Net-Zero Transition Plans • International Financial Reporting Standards Foundation's International Sustainability Standards Board (IFRS ISSB, 2023) Sustainability Disclosure Standards.

Focus on FI-level transition plan alignment assessments[28]

Given the wide range of practices taken by financial institutions as part of their net zero approaches, methodologies are being developed, building on alignment frameworks, to assess a financial institution's progress along its alignment journey, its global approach to net zero and the quality of its transition plan as a whole, including the presence and adequacy of net zero targets and the strategic and organisational means put in place to achieve them.

These methodologies can be used by financial institutions to inform and support the construction of their transition strategies and plans, and by external stakeholders to evaluate the adequacy of financial institutions' disclosures, and in certain cases plans, strategies, actions and progress along their alignment journey.

Most of these methodologies are solely based on qualitative data: their objective is to rate how transparent financial institutions' transition plans and broader disclosures are, across a number of required dimensions as identified in alignment frameworks. These include (non-exhaustive):

- CDP assessments of Climate Transition Plans, part of the wider CDP Net Zero Alignment Dataset, which covers a range of sectors, including the finance sector (CDP, 2023);
- The French Observatoire de la Finance Durable FI-level net-zero analysis (OFD, 2023).
- The TPI Banking tool Carbon Management module, which sits alongside the TPI Banks Management Quality module (TPI Banking tool, 2023).
- Several ad-hoc reports published by a range of organisations, such as ShareAction (ShareAction, 2023).
- The WWF-commissioned "Net Zero Transition Plans: Red Flags Indicators to Assess Inconsistencies and Greenwashing" which proposes "a natural language processing (NLP)-based tool to automate the extraction and assessment of plans" that can be applied to financial institutions (WWF, 2023).
- The Climate Policy Initiative Net Zero Finance Tracker that compiles and harmonises information on 562 institutions on their "targets, strategy and impact" - which can be viewed at the individual, at the initiative or the aggregate-level (CPI, 2023).
- Reclaim Finance published a report comprising Red Flag Indicators "that can be used to quickly screen a climate plan and identify major gaps and inconsistencies", based on an exhaustive review of 26 "transition plan frameworks" (Reclaim Finance, 2024).

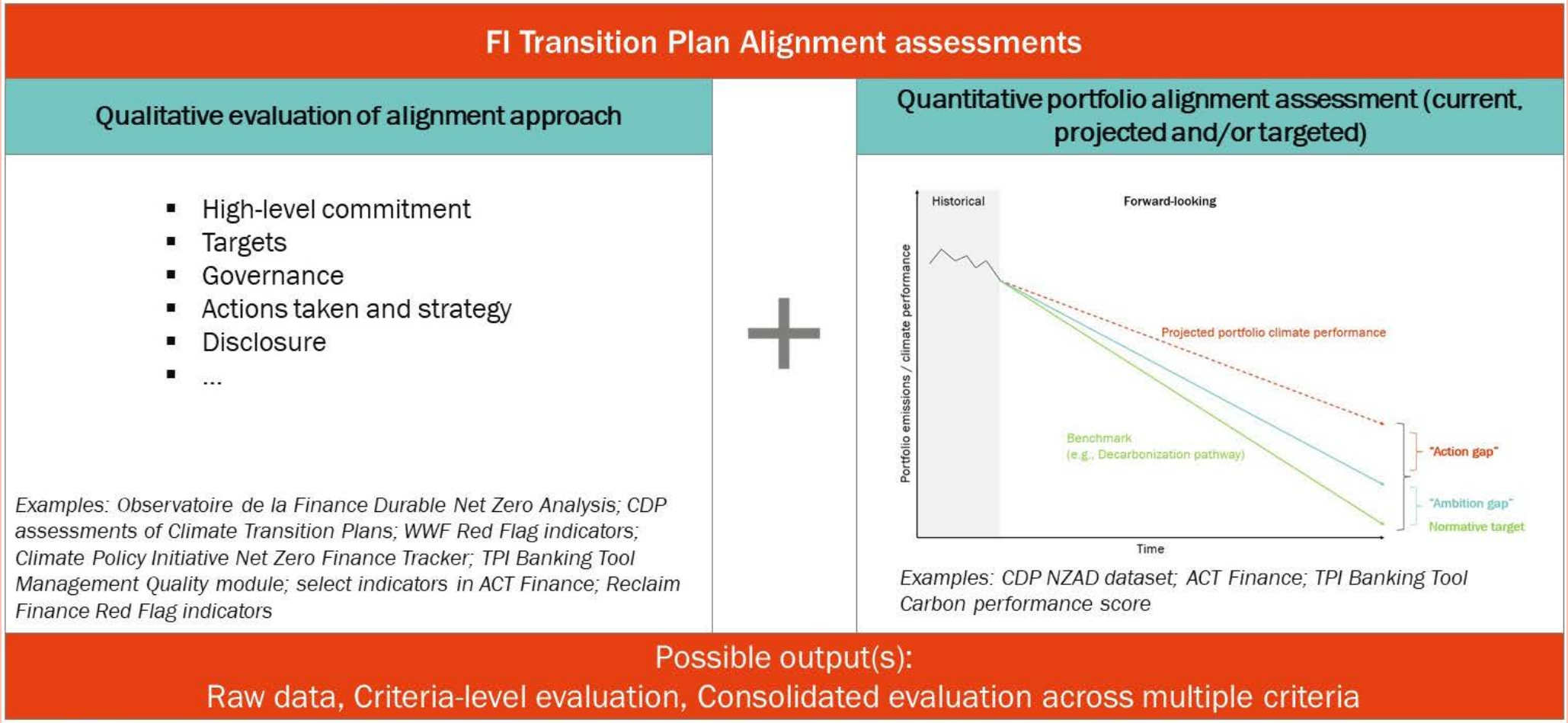
A small number of methodologies go further and include an *assessment, or evaluation,* of financial institutions' *adequacy* of targets' and/or portfolio alignment with low-carbon trajectories, *alongside qualitative indicators*. These methodologies are built on a combination of qualitative and alignment performance elements.

These include ACT Finance, the TPI Banking framework and the CDP NZAD datasets comprising the Temperature Rating score and the CDP assessments of Climate Transition plans.

Notably, the way the alignment approach and performance is evaluated depends on the methodology, and can be more or less sophisticated. This report deep-dives into quantitative portfolio alignment methodologies in the next sections and does not seek to compare how FI-level methodologies rate other qualitative elements. Yet, it can (and arguably should) represent a very large share of the final financial-institution alignment rating, given the lack of methodologies to link portfolio alignment to real world change. For example, qualitative criteria represent c. 60% of the final ACT Finance grade.

28 These methodologies are called FI Transition Plan Alignment assessments as usually presented in the literature but refer to Fi's approach to net zero as a whole, rather than their specific transition plans.

Figure 5: Building blocks of FI Transition Plan alignment assessments



1.2.2 Portfolio alignment metrics and methodologies

A range of methodologies and metrics focus specifically on the portfolio-level. They are used by financial institutions to set portfolio-level targets, build and implement portfolio-level strategies to meet these targets, monitor and report on portfolio alignment progress. These methodologies and metrics are sometimes referenced in alignment frameworks and used as inputs in FI-level transition plan alignment assessments (see box p.29).

Historically, emissions and green/brown exposure metrics have been the most widely used metrics[29].

- **Portfolio emissions accounting** refers to the quantification of the greenhouse gas emissions associated with financial flows to assess their negative contribution to climate change. Emissions accounting encompasses a wide range of methodologies and hypotheses, which have been widely studied and formalised in standards such as PCAF (PCAF, 2022; PCAF, 2022; PCAF).
- **Green/brown activities share assessments** encompass a range of methodologies and metrics that attempt to assess the extent to which a financial asset and by aggregation financial portfolio is exposed to activities that are (in)compatible with the transition.

Portfolio emissions accounting and green/brown exposure assessments generate static and unqualified climate performance metrics. These offer a photography in time on the climate performance of financial assets and investment portfolios.

While these metrics feed into portfolio alignment strategies, these "traditional" climate accounting methodologies cannot be used *alone* to make a *dynamic and qualified* assessment on the sufficiency/insufficiency of climate performance, with regards to the long-term global temperature objective.

Taxonomies are being developed around the world to support the identification of sustainable activities and by extension financial assets and portfolios, through taxonomy alignment metrics. While these metrics provide a much-needed qualified assessment on the (in)compatibility of a range of activities with the Paris objective at a given point-in-time, most remain based on thresholds rather than forward-looking assessment, except for a few notable exceptions (MAS, 2023).

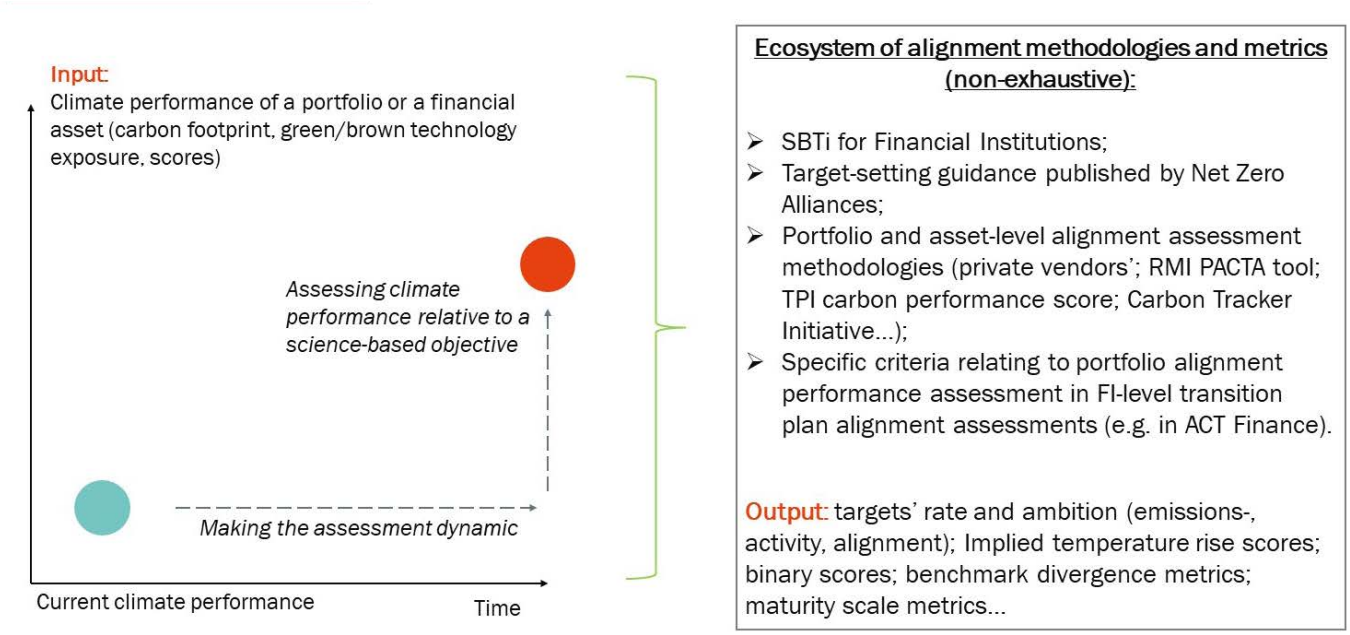
As put by the UNFCCC Standing Committee on Finance, "the trend towards developing climate, green or sustainable finance taxonomies [...] can support the identification of activities that are consistent with such pathways, but may risk excluding necessary investment in high-emission sectors or activities that can support the overall transition to such pathways" (UNFCCC, 2022). As such, taxonomy-alignment and alignment assessment approaches are complementary[30].

This observation led to the development of alignment methodologies and metrics to put into perspective the climate performance of a financial asset and by aggregation financial portfolio with the global temperature rise limitation objective (ILB, 2020). Notably, emissions, green brown share, and taxonomic alignment metrics (including CAPEX) are one of the building blocks of alignment methodologies but not sufficient by themselves.

These alignment methodologies combine *past, current and/or projected* climate performance metrics with data relative to downscaled carbon budget and associated low-carbon pathways (see figure 6) to derive a targets' rate and ambition, or assess alignment (ex-ante/ex-post). They result in alignment metrics, such as targets and/or alignment assessments, used to drive or monitor alignment.

29 Transition and physical risks metrics are excluded from this review as they focus on the other side of the story, risk, rather than contribution to the Paris Agreement goals.
30 See for example the "stronger together" report by CDP and Clarity AI, 2023.

Figure 6: Most portfolio and/or financial asset-level alignment methodologies build on "traditional" climate performance data.



Portfolio and/or financial asset-level alignment methodologies have historically been used by financial institutions for "exploratory purposes and reporting". In 2020, the Alignment Cookbook noted that increasingly "[alignment] approaches are explored in the context of target-setting and building investment strategies to align portfolios through time. Therefore, these methodologies are becoming instrumental in steering action and transitioning portfolios, amongst a range of other approaches such as [emissions footprint and transition metrics]" (ILB, 2020).

This trend has accelerated since 2020. **Alignment methodologies are used by financial institutions to**:

1. Assess alignment and generate *alignment metrics*, used for:
    a. Target-setting (see below);
    b. Ex-post and ex-ante alignment monitoring;
    c. Building strategies and taking action.
2. Design and *set "science-based" portfolio-level targets* on emissions, activities and/or alignment metrics.

The GFANZ report includes several case studies on how alignment metrics are used by financial institutions (GFANZ, 2022). Part 2 deep-dives into how alignment methodologies are used for target-setting and alignment assessments.

Table 3: High-level review of alignment methodologies and metrics use cases

Use case	Reliance on alignment methodology	Link to GFANZ, 2022 detailed case studies
Design and set "science-based" portfolio-level targets.	An alignment methodology can be used to set the rate and ambition of the target so that it is in line with low-carbon pathways commensurate with the net zero objective (so that they are "science-based"). Targets can be set using emissions, activities and/or alignment metrics as an input. The latter also rely on an alignment methodology to derive the alignment metric, used as input into the target.	See GFANZ case studies on: - Calibration and monitoring of net zero targets

Assess alignment and generate alignment metric	An alignment methodology can be used for ex-ante monitoring to compare current/projected climate performance with low-carbon pathways commensurate with the net zero objective, answering the question(s): How far the financial asset or portfolio performance today is compared to where it should be according to the benchmark in T+N? Is the financial asset or portfolio on the right path to reach the desired state in T+N? An alignment methodology can be used for ex-post monitoring to: • Compare the past climate performance trends of a financial asset or portfolio with low-carbon pathways commensurate with the net zero objective, answering the question: Has the financial asset or portfolio followed the required trajectory in the past? • Monitor the change in the alignment performance of a portfolio or financial asset answers the question: Compared to prior assessment, is the portfolio or financial asset on a different projected trajectory? Why?	See GFANZ case studies on: - Disclosure of net zero progress - Disclose the effect of policies on portfolio alignment - Engagement - Investment research and selection - Portfolio selection - Manager selection and monitoring - Calibration and monitoring of net zero targets
Build alignment strategies	Alignment methodology can be used to build "aligned" portfolios and products. Alignment metrics can be used to identify financial assets with which divest/invest/engage.	

The use of pathways in alignment methodologies

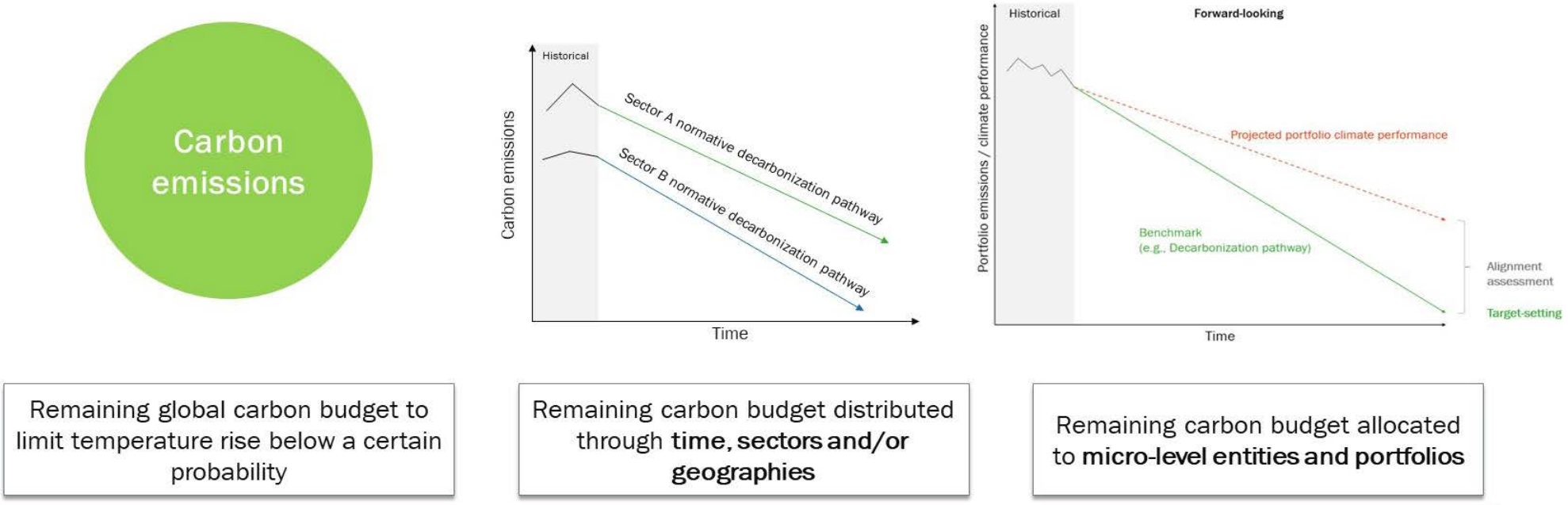
In this report, we define alignment methodologies as methodologies that combine *past, current and/or projected* climate performance metrics with data relative to downscaled carbon budget and associated low-carbon pathways. This is a restricted use of the term "alignment" - which is sometimes used to englobe methodologies that are based on qualitative rather than performance-based assessments elements only.

The logic of alignment assessment and target-setting is complementary. Alignment assessments and target-setting methodologies both rely on (an) alignment benchmark(s), derived by allocating pathways from scenarios to the level of aggregation chosen.

We use the term "benchmark" as in the GFANZ Portfolio Alignment Measurement workstream[31] work rather than based on its traditional financial meaning, to designate the trajectory that portfolios and/or financial assets are expected to follow under different scenario pathways, leading to specific temperature outcomes.

31 Previously the TCFD Portfolio Alignment Team.

Figure 7: From the remaining carbon budget to alignment benchmarks - Schematic view.



NB: the shapes of the pathways are highly stylized and may differ depending on the allocation methodology. See the relevant sections of this report for a full discussion.

(These) benchmark(s) are used to 1. set (a) alignment target(s) within target-setting methods; and 2. as a comparative benchmark to derive an alignment metric for alignment assessments.

Alignment assessments thus go further than target-setting as they assess the gap between the climate performance of financial assets, sectors, portfolios and/or asset classes and (an) alignment benchmark(s), and express it with an alignment metric.

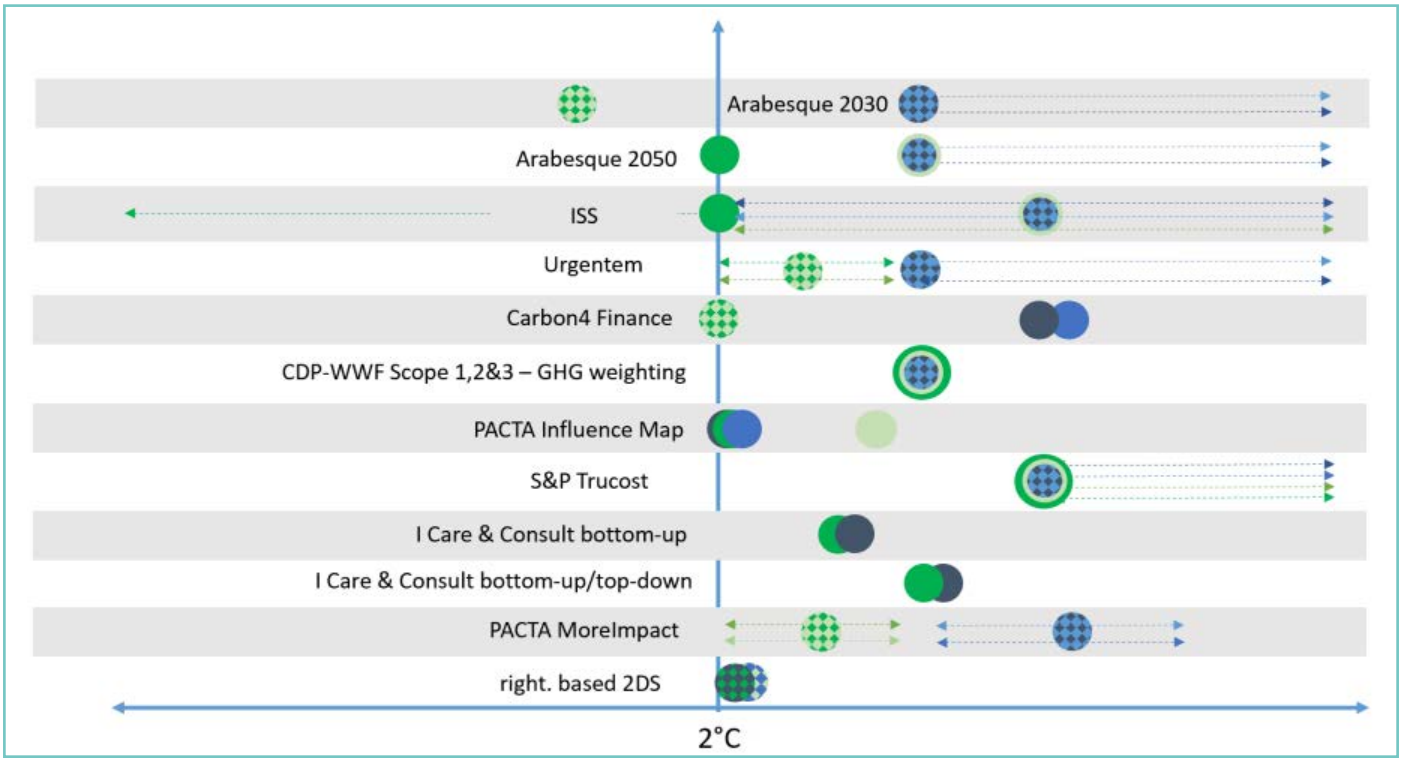
1.2.3 Challenges with existing portfolio alignment methodologies and their use in building consolidated alignment assessments

In their current state, the use of portfolio alignment methodologies by financial institutions and other stakeholders in effectively driving and monitoring alignment at different levels is limited by their diversity and heterogeneity.

Historically, alignment methodologies have been developed in a context where no specific and binding guidelines existed, leading to differences in design choices and ultimately results.

- The ILB and subsequent research demonstrated that existing portfolio alignment datasets distributed by private vendors can produce very different results for the same financial asset and portfolio (ILB, 2020; OECD, 2022; INFRAS, 2022).
- Multiple portfolio target-setting methodologies exist, leading to different rates and ambition levels. Given the large range of target-setting methodologies, it is unclear whether the resulting targets, even if achieved at the individual level, will collectively lead to the real-world decarbonization needed to respect the remaining global budget and ultimately achieve net zero in time at planetary level.
- It is unclear and unlikely that portfolio alignment assessment methods, in their current form, can be used to plan, and monitor, the progress of financial institutions portfolio emissions' targets. This can lead financial institutions to manage widely different tools internally whose results may move in opposite directions. Historically, portfolio alignment assessments and target-setting methodologies have been developed in silos, meaning that they often rely on different design choices (e.g. different choice of scenario) – making it possible that a portfolio has reached its decarbonization target but is still considered not aligned by the alignment assessment methodology chosen.

Figures 8 & 9: alignment methodologies produce different results at portfolio- (first figure) and financial asset- levels (second figure) (ILB, 2020; OECD, 2022)



Sector	Region	Provider A	Provider B	Provider C	Provider E	Provider D
Airlines	Asia	Not aligned	Not aligned	Not available	2 Degrees	Not aligned
Airlines	Pacific	Not aligned	Not aligned	1.5 Degrees	Not aligned	Not aligned
Airlines	North-America	Not aligned	Not aligned	Not aligned	Not aligned	2 Degrees
Autos	Asia	1.5 Degrees	2 Degrees	Not aligned	Not aligned	Not aligned
Autos	Europe	1.5 Degrees	2 Degrees	Not aligned	Not aligned	Not aligned
Autos	North-America	1.5 Degrees	2 Degrees	Not aligned	Not aligned	Not aligned
Shipping	Europe	Not aligned	1.5 Degrees	Not aligned	Not aligned	Not aligned
Shipping	Asia	Not aligned	Not available	Not available	Not aligned	Not aligned
Shipping	Asia	Not aligned	1.5 Degrees	Not available	Not aligned	Not available
Steel	Latin-America	Not aligned	2 Degrees	Not available	2 Degrees	Not available
Steel	Asia	Not aligned	Not aligned	Not available	2 Degrees	Not aligned
Steel	Europe	Not aligned	2 Degrees	Not aligned	Not aligned	Not aligned
Chemicals	Africa	Not aligned	Not available	Not available	Not available	Not aligned
Chemicals	Asia	Not aligned	Not available	Not aligned	Not aligned	Not aligned
Chemicals	Europe	Not aligned	Not available	Not aligned	Not aligned	Not aligned
Cement	Latin-America	Not aligned	2 Degrees	Not available	Not available	2 Degrees
Cement	Europe	2 Degrees	2 Degrees	Not available	Not aligned	Not aligned
Cement	Africa	Not aligned	Not aligned	Not available	Not aligned	Not aligned
Aluminium	Middle-East	Not available	Not aligned	Not available	Not available	Not aligned
Aluminium	Europe	Not aligned	2 Degrees	Not available	Not aligned	Not aligned
Aluminium	North-America	Not aligned	Not aligned	Not available	Not aligned	Not available
Power Utilities	Asia	2 Degrees	Not aligned	2 Degrees	Not available	Not aligned
Power Utilities	North-America	Not aligned	1.5 Degrees	Not aligned	Not available	2 Degrees
Power Utilities	Pacific	2 Degrees	Not aligned	Not aligned	Not available	Not aligned

Note: Results are latest available assessments for alignment in 2050. ITR results are assigned to the relevant category as this illustration aims to show the level of alignment and exact temperature results come with a higher level of uncertainty. 'Not aligned' means not aligned with a 2 degrees or below scenario as assessed by the methodology provider. 'Not available' means either not enough data to apply the methodology or no methodology available for that sector by the provider.
Source: Authors' calculations based on data from five selected providers.

Not only does this lack of convergence add burden to financial institutions that need to spend time and resources trying to understand the differences between methodologies, it also makes it difficult for external stakeholders to compare disclosures (beyond how transparent and complete they are), let alone consolidate them into a consolidated alignment assessment at group-level.

For example, existing FI-level transition plan alignment assessment methodologies (see box p.29) rely on their own proprietary evaluation of targets' and portfolio alignment: ACT Finance and the TPI Banking tool use their own methodology to assess whether the assessed targets are aligned, regardless of whether they are presented by the financial institution as "net zero" or "aligned".

ACT Finance also has a module to assess whether a portfolio's financial flows are aligned based on its own methodology and does not rely on published alignment results.

ACT Finance also has a module to assess whether a portfolio's financial flows are aligned based on its own principles: it does not take as granted the published alignment results but re-weight them through an assessment of the framework used by the financial institution to determine whether an asset is low-carbon or aligned[32]. These features prevent greenwashing from Financial Institution and increase comparability, but add complexity and, by taking different choices among methodologies, cannot provide a consistent message unless one methodology emerges at the expense of the others or they together converge through consensus.

Initiatives are ongoing to encourage the convergence of alignment methodologies.

- In a series of reports (PAT, 2020; PAT, 2021; GFANZ, 2022), the GFANZ Portfolio Alignment Measurement workstream[33] evaluates best practices and makes recommendations on how alignment methodologies should be designed, and calls for transparency from data providers to disclose their methodologies against defined "key judgements".
- The various Net Zero alliances publish detailed guidance to their members as to how to set their targets. The SBTi for Financial Institutions is driving convergence by developing guidelines on target-setting, often referenced in Net Zero alliances target-setting guidance/protocols/standards, but discrepancies remain and guidelines are not always followed by financial institutions (SBTi, 2023).
- WBA is currently setting up an ATP-CoI workgroup gathering various methodology developers in order to issue common principles on what a sound alignment methodology should encompass (WBA, 2023).
- To the authors' knowledge, little research looks at target-setting and alignment assessments together, using a transversal view. Existing reports focus on one or the other, making the links between the two types of methodologies difficult, let alone their convergence.

In the context of a consolidated alignment assessment, it means that portfolio alignment data published by financial institutions cannot be meaningfully compared, let alone aggregated.

Even if the *practical challenges* (difference in unit, time horizon, perimeter etc) that arise when attempting to consolidate heterogeneous metrics issued from different methodologies were solved, it is unclear what a consolidated metric would actually mean: would it be science-based? Would it be relevant to monitor and support real world decarbonization?

The trajectory on which financial institutions, or sub-group of financial institutions collectively are given their net zero targets is unclear because of the wide range of target types and design choices recommended and/or required by alignment frameworks, in particular Net Zero Alliances Target-setting guidance/protocols and target-setting standards. Relying on a patchwork of micro-level methodologies and metrics as a proxy for consolidated alignment runs the risk that no meaningful alignment message at group or subgroup level can be provided, thus not providing any comfort on the alignment with Paris 2.1.c objective of orientating financial flows.

In addition, research has shown that in *their current forms*, it is debatable whether portfolio alignment assessments can help assess whether financial institutions contribute to real-world decarbonization (ILB, 2020; I4CE, 2021). *In their current forms*, these metrics rely on assessing the extent to which a financial asset and/or financial portfolio *climate performance* is compatible with the low-carbon pathways necessary for the world to reach net zero. Most also focus only on the decarbonization part of the story, taking carbon removals for granted (ILB, 2020).

32 For instance, should the financial institution use a "black-box" indicator from a provider in order to disclose its share of aligning assets, the ACT Finance methodology will grant low points as there is no clear guarantee on the quality of the framework. On the contrary, should the financial institution use a disclosed assessment methodology taking into account key points: alignment of targets, assessment of locked-in emissions... it will be granted full points.

33 Previously the TCFD Portfolio Alignment Team.

Given current methodologies, a theoretically 1.5°C aligned portfolio is likely to have lower overall past, current and/or projected carbon emissions than a non-aligned portfolio with the same sectoral distribution, provided an appropriate assessment methodology. Such a portfolio may be considered more "climate-friendly". It does not necessarily mean, however, that 1. It is invested in financial assets that decarbonize through real changes and 2. Its "improved" climate-friendliness has resulted in real changes: the lower emissions and higher alignment score could be due to selling carbon-intensive assets to other investors or market value changes.

Finally, most existing alignment methodologies focus on decarbonization and take implicitly removals for granted when attributing an alignment rating to a financial asset or portfolio (ILB, 2020). Target-setting methodologies on financial institutions' emissions neutralisation are emerging, but less discussed than carbon mitigation. In addition, as noted by the UNFCCC, "there appears to be limited evidence of the degree to which financial actors are aligning their investment mandates with climate resilience goals linked to Article 2, paragraph 1(b), of the Paris Agreement" (UNFCCC, 2022). As such, alignment methodologies focus on only one part of the equation.

Emerging approaches to assess/support financial institutions' contribution to real-world decarbonization

Methodologies are being developed to capture whether financial institutions' actions contribute to real world decarbonization. This is an important area of research. As noted by the UNFCCC "measuring the effective role of financial actors in the context of Article 2, paragraph 1(c), is a notable topic of debate among initiatives, including which metrics are most important as indicators of success. [...] Assessing the real-economy impact and the risk of greenwashing remains a challenge" (UNFCCC, 2022).

- 2° Investing Initiative is developing real world accounting approaches to evaluate, ex-post, the "extent to which GHG emissions reductions in the real economy are achieved". It develops a two-level approach to "help financial institutions track whether their actions and the actions on the companies they hold are leading to changes in the real economy". The first level evaluates whether portfolio changes are caused by divestment and portfolio reallocation or due to investee company improvements through ex-post change attribution. The second level evaluates whether assets have decarbonized through real or virtual changes (2° Investing Initiative, 2022).
- GFANZ recently introduced the concept of Expected Emissions Reduction (EER) which aims at quantifying the decarbonization contribution potential of portfolio holdings and clients. This forward-looking metric, still in exploratory phase, could, according to GFANZ, complement the suite of metrics used by financial institutions, by capturing the "broad, whole-economy decarbonization impact of Climate Solutions or efforts to finance the emissions reduction potential of high-emitting exposures" (GFANZ, 2023). This concept has raised several questions amongst a number of actors, including on but not limited to the attribution of the emissions reduction across various actors and the uncertain nature of future emissions' reduction (see Reclaim Finance, 2023 for an example response).

To go further, the paper published by Caldecott et al. (2022) as part of the Finance Sector Expert Group for Race to Zero and Race to Resilience "presents selected research from the research community and frame a set of questions to begin exploring the theme of 'real economy impact' in the context of Paris Alignment in more depth".

In the end the relevance of the issue itself might be questioned: will portfolio alignment assessments ever be sufficient in themselves to give a sense of the (indirect) contribution of financial institutions to real-world decarbonization or should portfolio-level assessments be integrated within a wider financial-institution level transition plan alignment assessments which also take into account the strategy and actions of the financial institutions, as done in ACT Finance and other approaches?

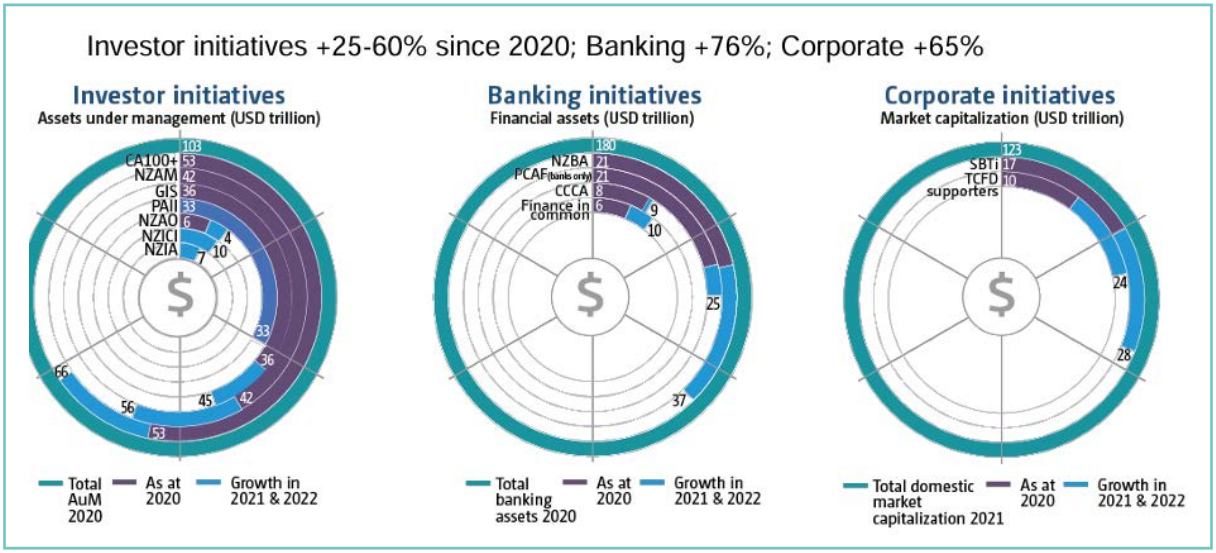
1.2.4 Examples of existing consolidated alignment figures

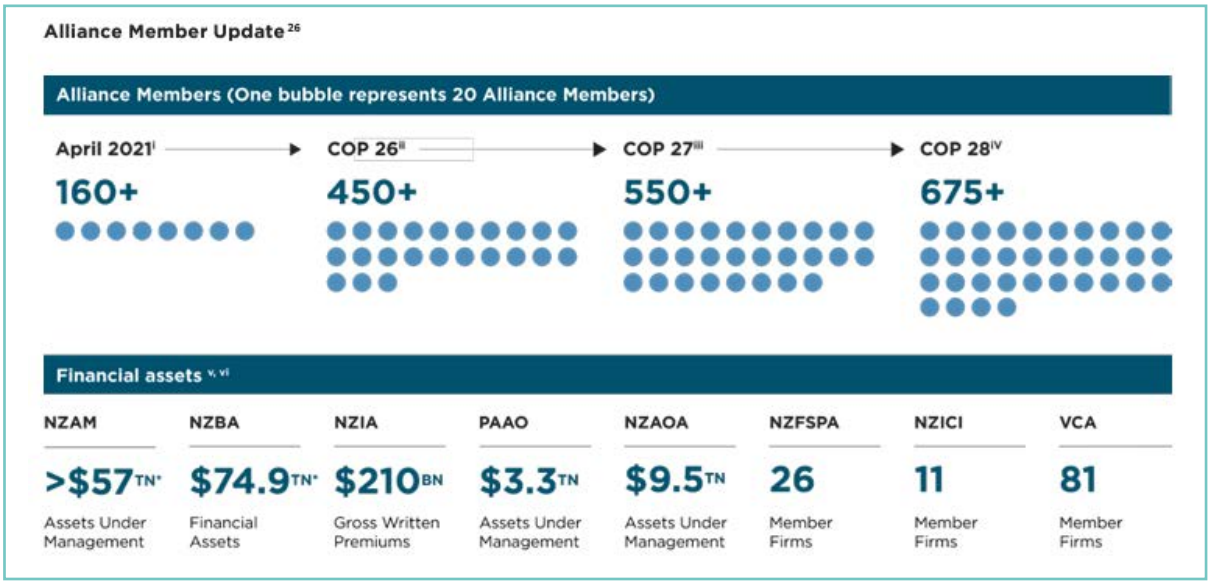
Given the limitations above, current attempts at assessing the consolidated alignment of a *group of financial institutions* have remained limited. While financial institution level transition plan alignment assessments constitute an interesting avenue to do so, the challenge is to incorporate a wide range of data sources - from current portfolio composition to portfolio-level targets and financial institutions' strategy and approach to net zero - in a consistent and meaningful way, *and consolidate it at higher levels.*

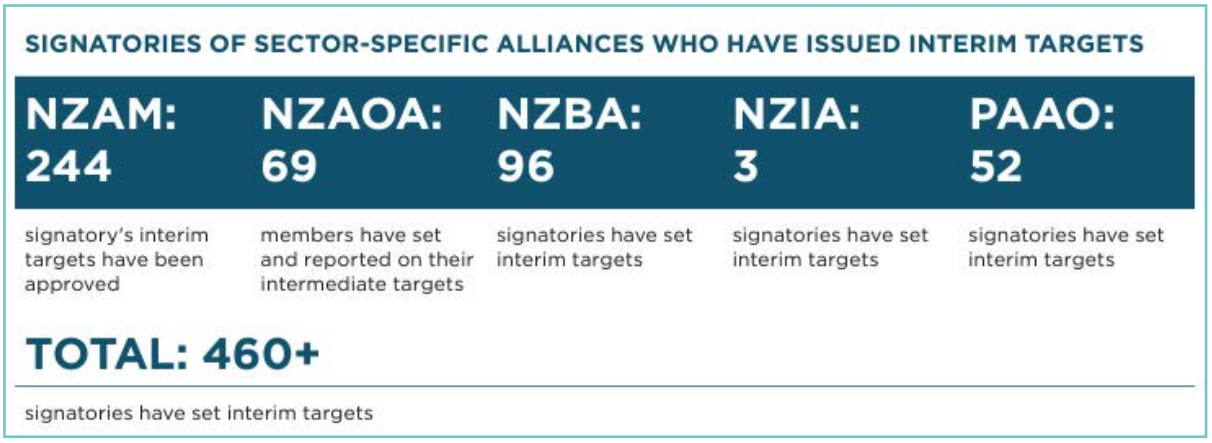
- Metrics used in the UNFCCC Global Stocktake in relation to Article 2.1(c) include growth of public sector initiatives through a stakeholder mapping exercise and figures on the scale and volume of financial initiatives related to efforts to achieve the goal set out in Article 2.1c.

While it is an important first start, data on the scale and volume of financial Initiatives is not sufficient to assess how appropriate, or "aligned", the collective commitments, targets and actions of their members are. It also does not provide information on how (mis)aligned other financial institutions may be.

Figures 10 to 13: Example reporting on the scale and volume of financial institutions and companies having joined net zero initiatives (UNFCCC. SCF, 2022; GFANZ, 2023). Figures may not match because of the different dates at which the figures were produced.





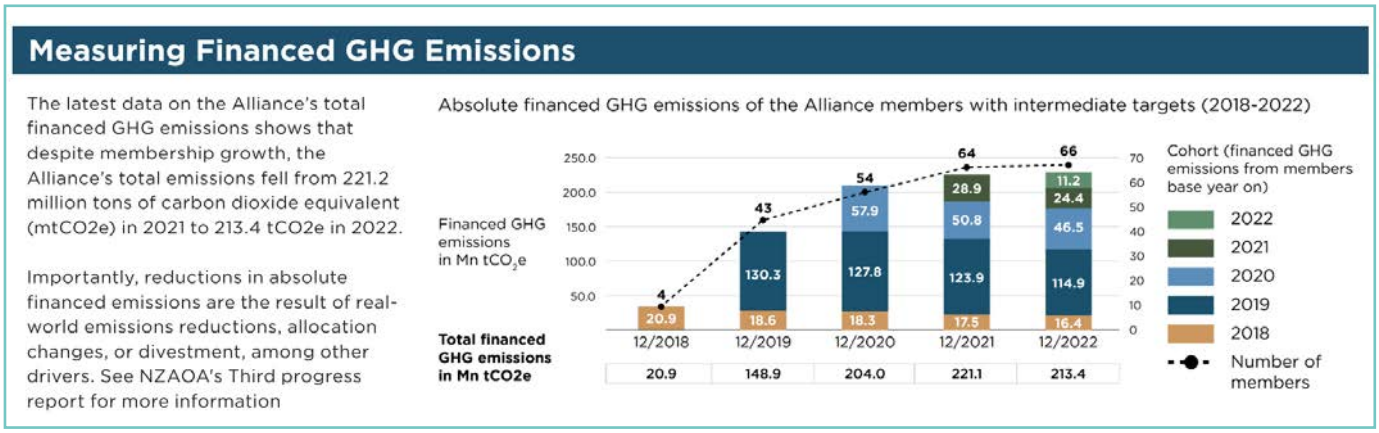


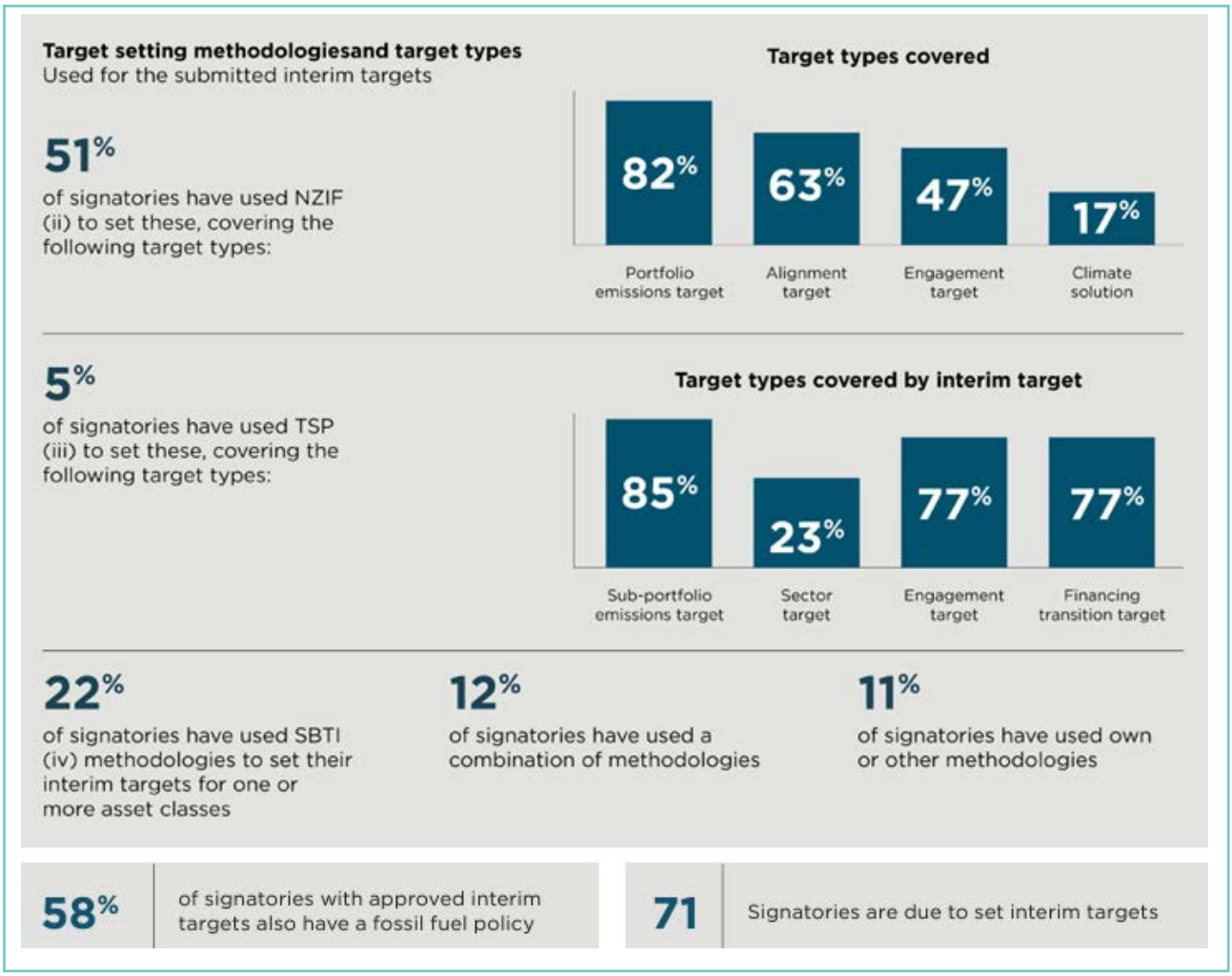
- Net Zero Initiatives have developed frameworks and tools to support financial institutions' net-zero commitments and turn them into action, but they have so far omitted to develop methods to assess the collective dynamic they triggered.

A number of these initiatives publish progress reports, such as the NZAOA progress report (2023), which include indicators such as assets under management covered by net zero commitments, average decarbonization rates per asset class, or decrease in the total absolute emissions financed by its members. These measures are an interesting first start but are only one brick of alignment assessments. In addition, it does not seek to assess whether emissions reductions' are real or virtual[34], or evaluate its members' actions or adequacies in driving real-world decarbonization.

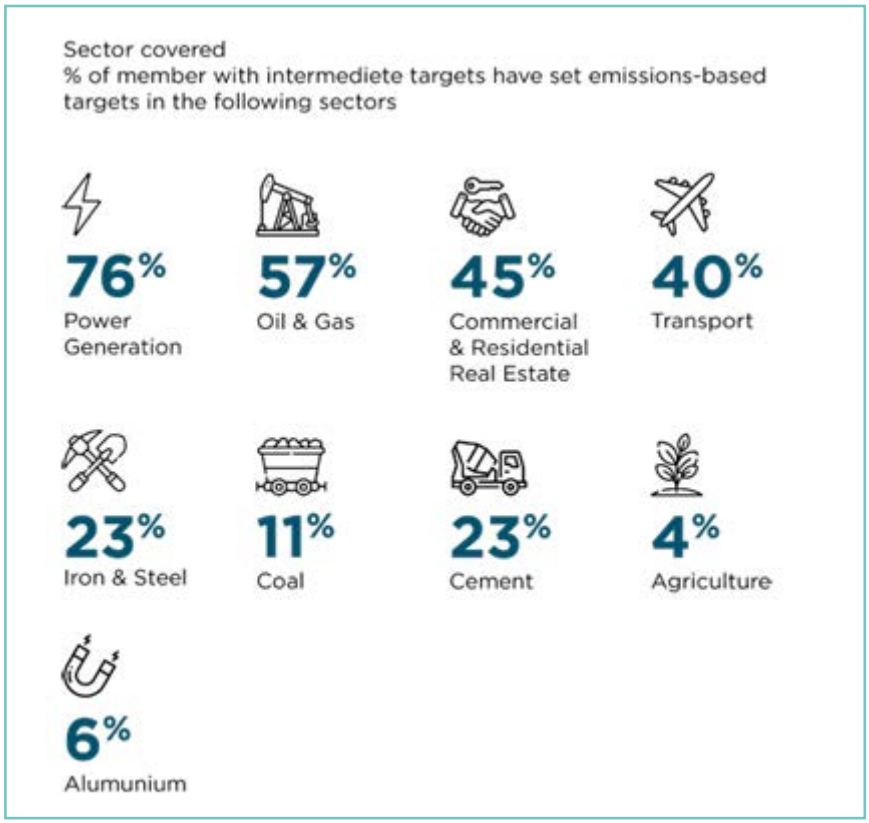
Figure 14 to 16: example of progress metrics disclosed by Net Zero Initiatives (GFANZ, 2023)

Figure 14: NZAOA; Figure 15: NZAM; Figure 16: NZBA





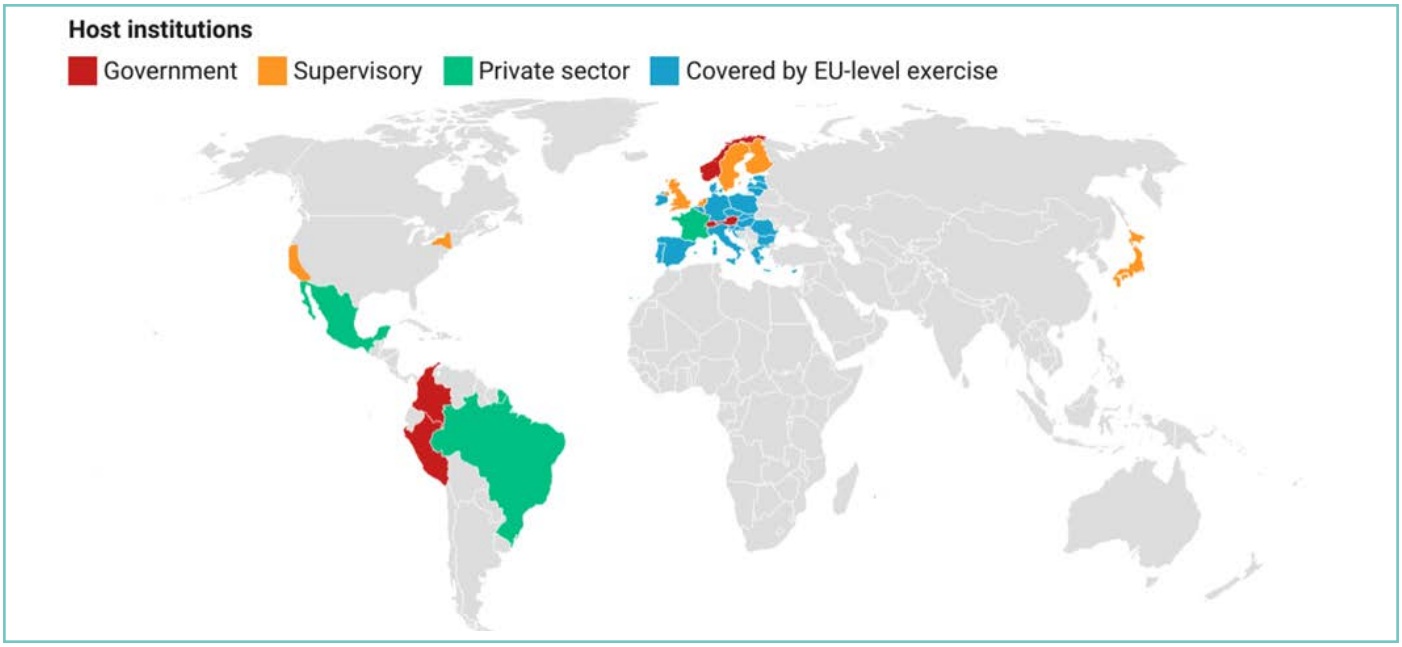
34 The NZAOA notes that the decrease in total absolute emissions financed by its members can be attributed to a range of factors, not necessarily linked to real-world decarbonization.



- PACTA is the only methodology, to the authors' knowledge, that has been used to generate consolidated alignment figures for groups of financial institutions, through the PACTA Coordinated Projects program (PACTA COP). The objective of this program is "to measure the alignment of the entire financial sector as well as individual participating institutions".

This is the only project, to the authors' knowledge, that aims to assess alignment at a consolidated level. 2° Investing Initiative has conducted several assessments including for a range of governments and supervisory bodies. The PACTA methodology focuses on the alignment of financial portfolios with climate goals across a set of climate critical sectors and technologies. The assessment provides a five-year forward looking, bottom-up analysis, based on capacity and production values of physical assets in the real economy consolidated up to corporate entities and portfolios. The assessment is based on current portfolio composition - and does not incorporate financial institutions' targets or strategies.

Figure 17 to 19: Range of consolidated assessments conducted (figure 1) and example outputs of CAPA COP (figures 2 and 3) (2° Investing Initiative, 2020, 2° Investing Initiative, 2021, ECB, 2024)



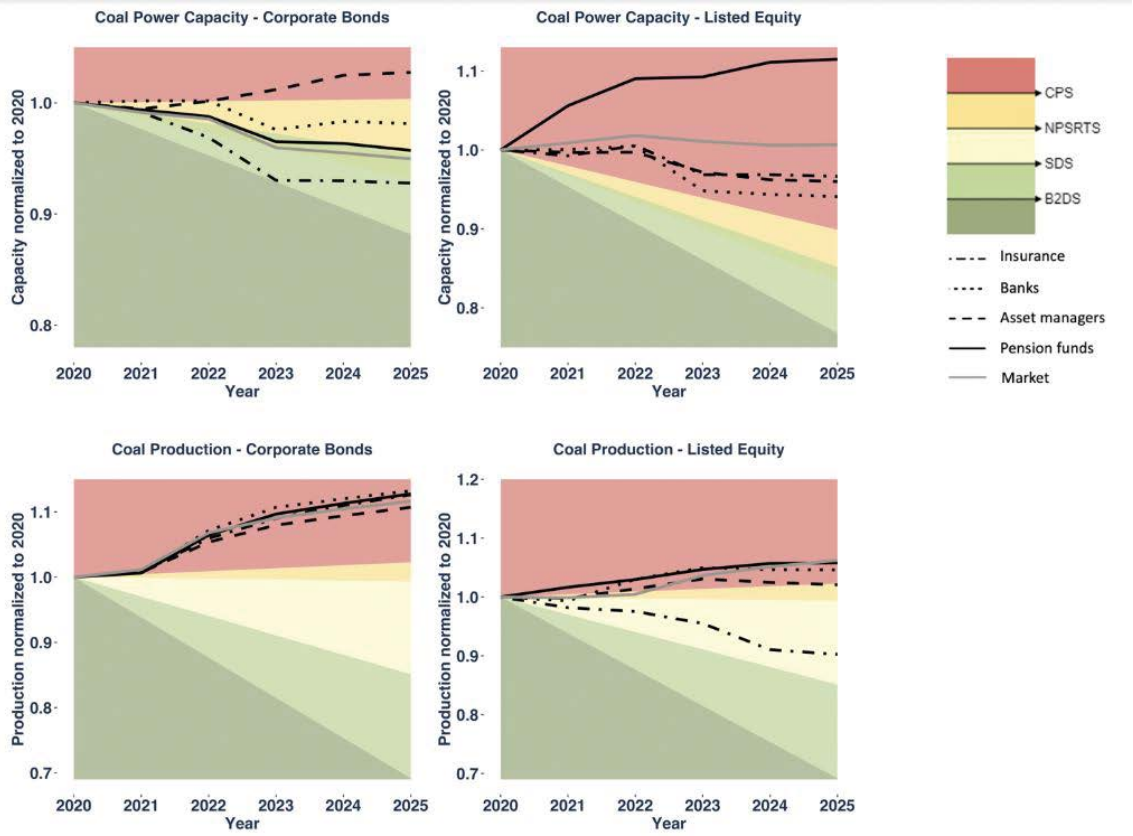
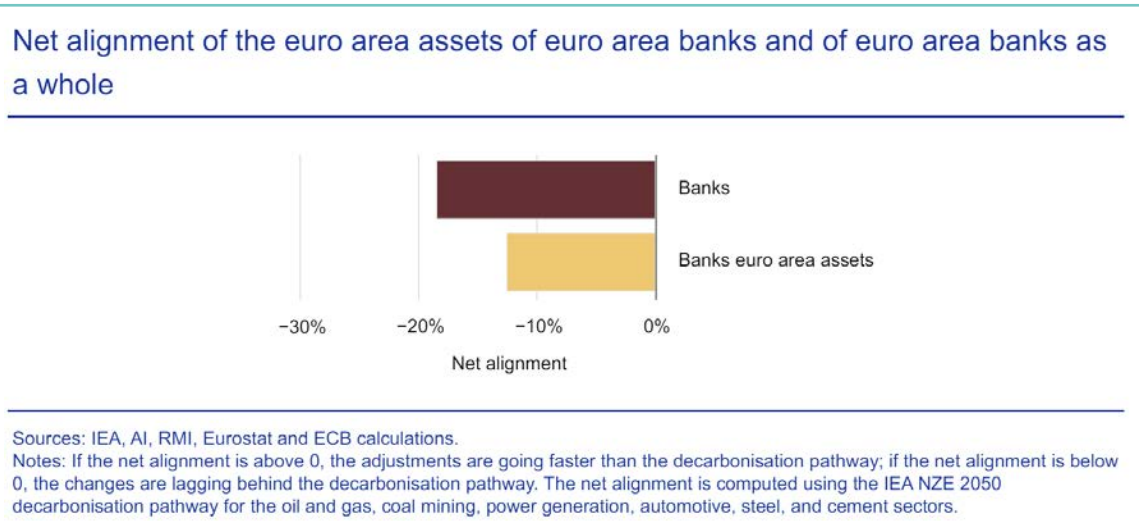


Figure 5: Production plans (coal mining and coal power capacity) of different types of Swiss financial institutions compared to the build-out rates required under different climate scenarios. The gray line marks the trajectory of the global market. (Source: 2°Investing Initiative)



THE RECIPES - DEEP-DIVE INTO PORTFOLIO ALIGNMENT METHODOLOGIES

This part further deep-dives into the portfolio-alignment methodologies identified in part 1. It maps and classifies the methodologies used for target-setting and alignment assessments based on their focus. The specific methodological choices that can be made when designing and implementing these alignment methodologies are reviewed in part 3.

The objective of this part is to help the reader make sense of the different families of target-setting and alignment assessment methodologies that exist, how they can be used to drive and monitor portfolio alignment, with a focus on how they fit together. This will help answer the questions:

1. Are some target and alignment assessment types more relevant than others in driving and monitoring the transition to the net zero planetary objective? Can and should they be combined and how?
2. How does target-setting and alignment assessments inform each other? Can different target types be reconciled? Can different alignment assessment types be reconciled? Under what conditions?

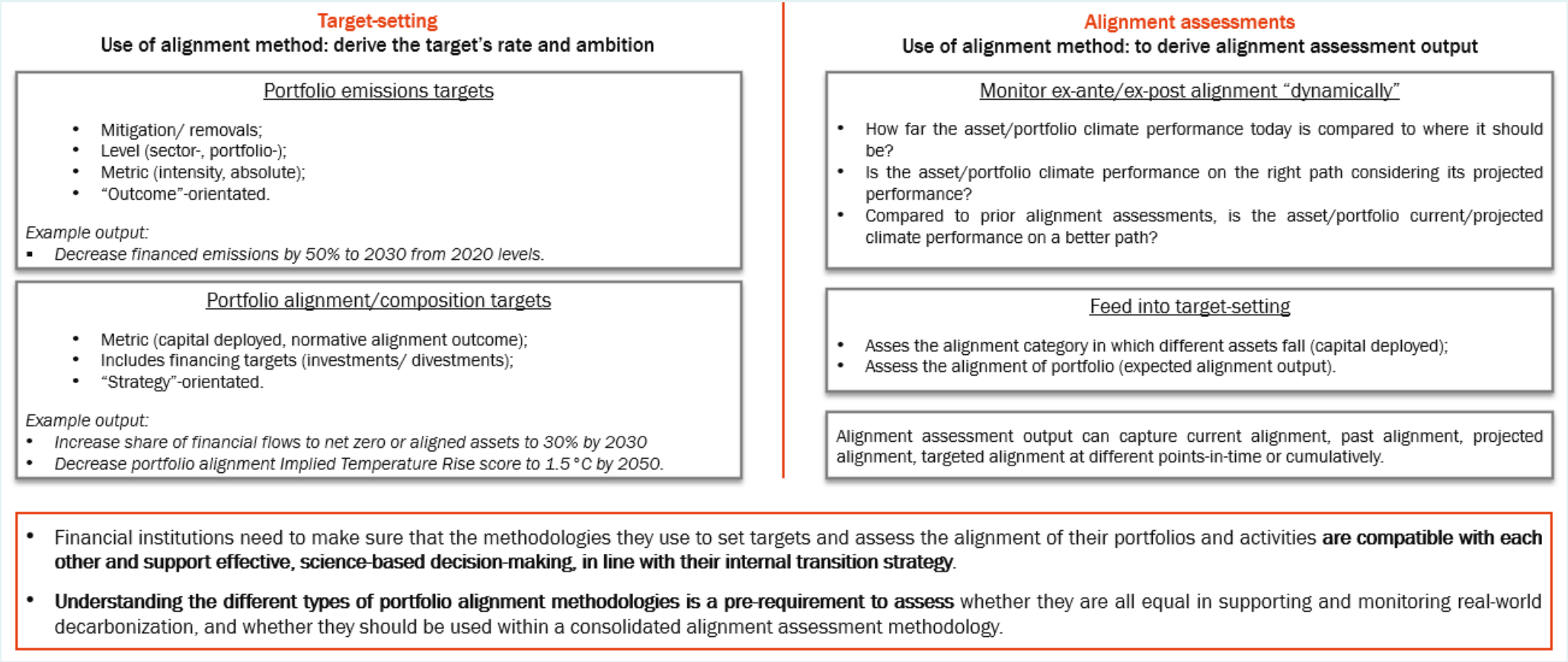
Why is this important?

From a micro perspective, financial institutions need to make sure that the methodologies they use to set targets and assess the alignment of their portfolios and activities for internal purposes are compatible with each other and support effective, science-based decision-making, in line with their internal transition strategy.

Targets built on methodologies that are not in line with the financial institution's chosen transition strategy(ies) may lead to internal tensions, thereby wasting time and resources. In addition, it is common that financial institutions use different methods to set targets and assess alignment. Where the underlying design choices are not in line (e.g. different scenarios used in target-setting and alignment assessment), discrepancies may arise overtime, creating confusion, and delayed action.

From a consolidated alignment assessment perspective, understanding the different types of portfolio alignment methodologies is a pre-requirement to assess whether they are all equal in supporting and monitoring real-world decarbonization, and whether they should be used and combined within a consolidated alignment assessment methodology.

Figure 20: Part 2 summary



2.1 THE CONTEXT: FROM DECARBONIZATION TO TRANSITION FINANCE STRATEGIES

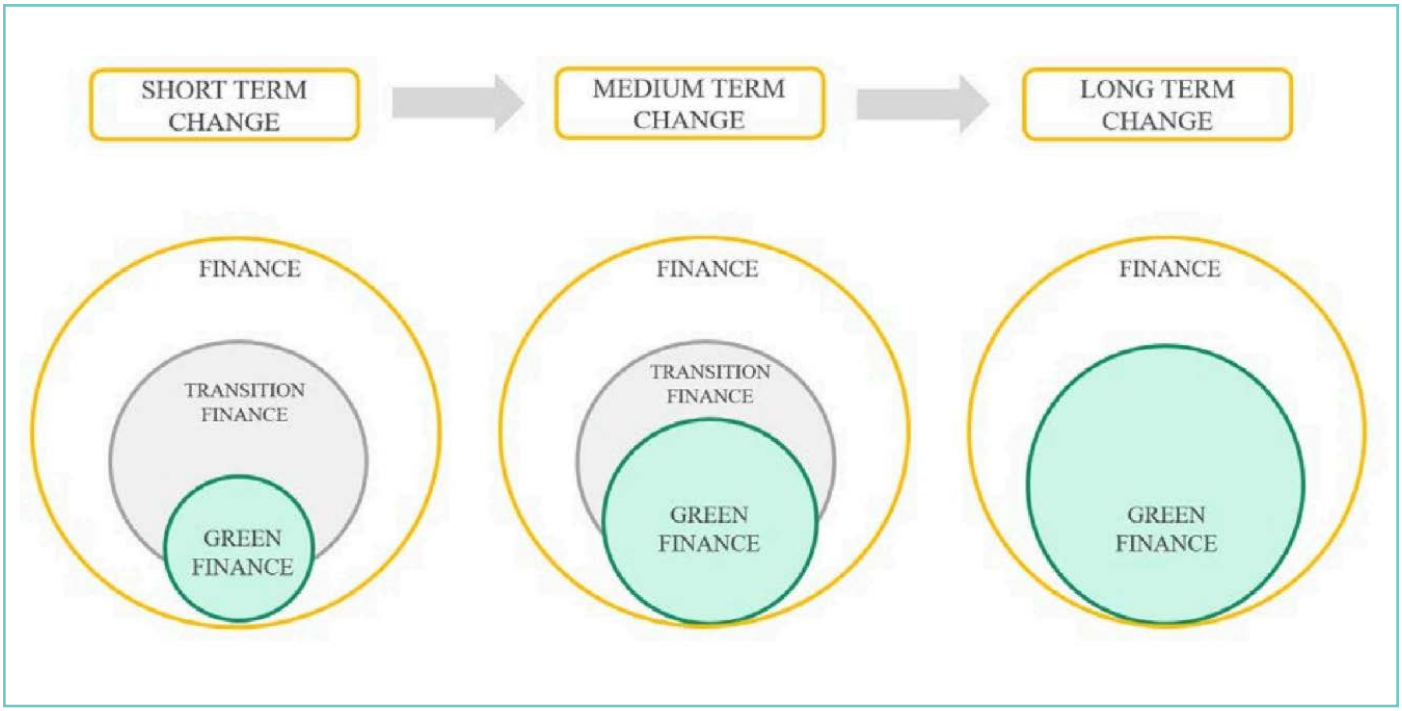
Alignment frameworks support individual financial institutions along their alignment journey in meeting their commitments and contributing collectively to the planetary goals. An important step lies in devising strategies. Alignment frameworks are more or less detailed, but seldom prescriptive, on what specific strategies can and should be implemented.

To be relevant, metrics and methodologies, including target-setting and alignment assessments, need to support the devising, implementation and monitoring of these strategies and their results. Consequently, it is necessary to first understand the range of strategies that exist before proceeding to review and classify alignment methodologies—both target-setting and alignment assessments—based on how they can feed into these strategies.

Within the last few years, transition finance and associated strategies have taken centre stage in discussions on the financial sectors' contribution to the goals of the Paris Agreement. For example, ten NGOs published a call for action ahead of COP28 calling on the finance sector, governments and corporates to increase their deployment of transition finance (RMI, 2023).

While no unique definition of transition finance exists, it is worth noting that the European Commission published its own in 2023 (European Commission, 2023), showing the articulation between sustainable and green finance: "Sustainable finance is about financing both what is already environment-friendly and what is transitioning to such performance levels over time". The European Commission further clarified the definition of transition finance, as "financing of investments compatible with and contributing to the transition that avoids lock-ins." However, the proposed definition remains at principles level and does not provide operational insights on which financial asset would be transitioning or not.

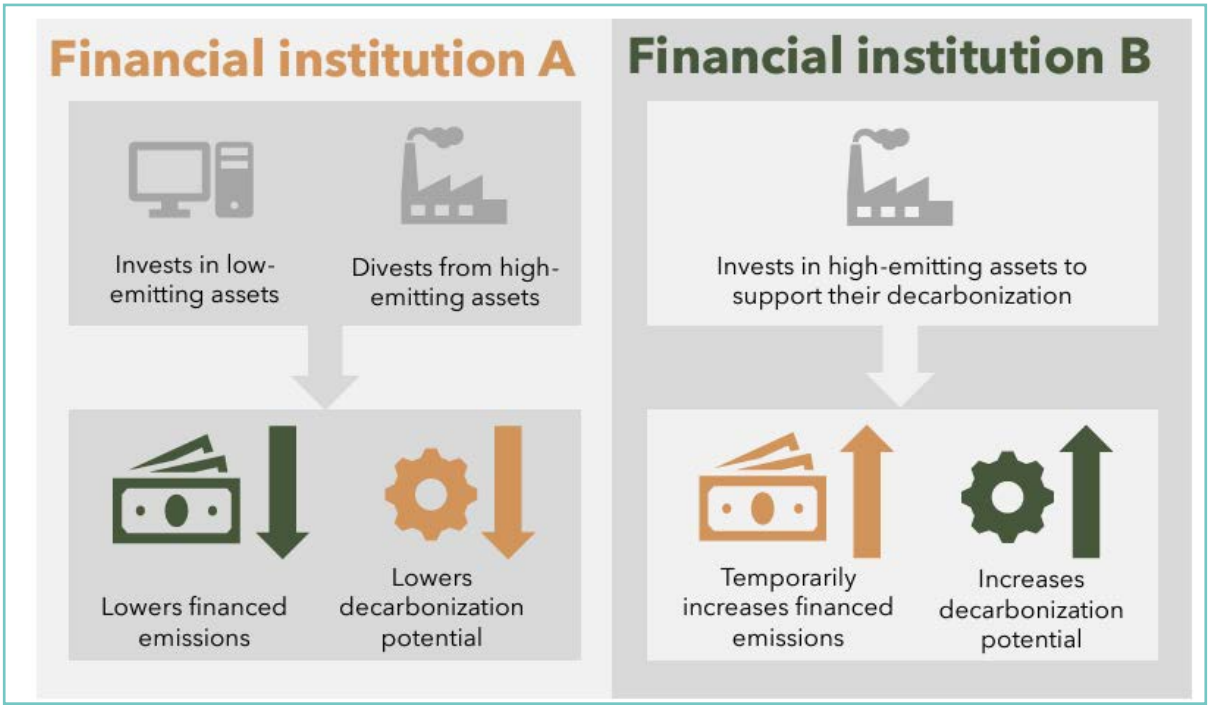
Figure 21: Relationship between green and transition finance today and over time (European Commission, 2023).



This increased interest in transition finance focus may be explained by an increased recognition that portfolio decarbonization strategies based on divesting from high-emitting assets to reinvest in low-emitting assets may only lead to "virtual" decarbonization.

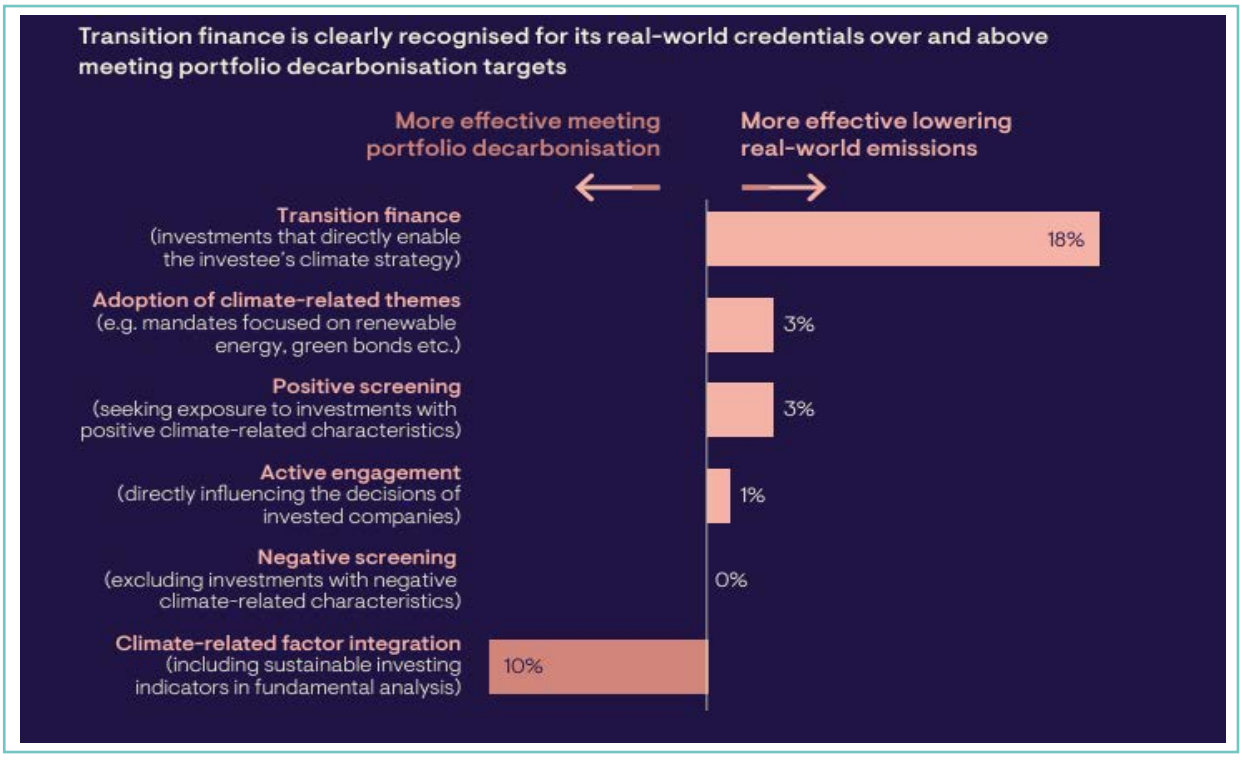
As such, transition finance strategies are seen as having a higher chance of resulting in real-world impact compared to strategies that consist in financing or enabling assets and activities that have a lower *current/static* emissions footprint than their peers. In fact, a number of transition finance strategies may lead to increased portfolio emissions in the short-term, such as investing in highly-carbon intensive assets gradually transitioning.

Figure 22: Strategies that lower portfolio financed emissions may not increase real-world decarbonization potential (GFANZ, 2023).



The asset manager Ninety-one has conducted a global survey of over 300 asset owners and consultants. It found that "the majority of asset owners (55%) who implement climate-related factor integration as an investment tool say it contributes more to portfolio decarbonisation than to reducing emissions in the real world (45%). Transition finance displays an inversion of this pattern – 34% say it makes a significant contribution to portfolio decarbonisation, compared to 52% who say it is lowering real-world emissions (Ninety One, 2023)".

Figure 23: Transition finance is globally better perceived by Financial Institutions for its real-world credentials over and above decarbonisation strategies (Ninety One, 2023).



Deep-dive into selected transition finance strategy categorisations

No single definition and classification of transition finance strategies exist. Two are particularly interesting and worth highlighting given their visibility.

The Commission details a number of strategies, including (European Commission, 2023):

- Investments in portfolios tracking **EU climate transition benchmarks and EU Paris-aligned benchmarks** ("EU climate benchmarks");
- Investments in **Taxonomy-aligned economic activities**, including transitional economic activities and Taxonomy-eligible economic activities becoming Taxonomy-aligned in accordance over a period of maximum 5 (exceptionally 10) years;
- Investments in undertakings or economic activities with a **credible transition plan** at the level of the undertaking or at activity level;
- Investments in undertakings or economic activities with **credible science-based targets**, where proportionate, are supported by information ensuring integrity, transparency and accountability.

The categorisation and description of these strategies can, and have been, questioned, but are broadly in line with the typology developed by GFANZ as part of its work on financial institutions transition plans. GFANZ typology further articulates the topic of transition finance with the concept of "alignment" (GFANZ, 2022).

- **"Climate solutions**: Financing or enabling entities and activities that develop and scale climate solutions. This strategy encourages the expansion of low-emitting technologies and services, including nature-based solutions, to replace high-emitting technologies or services, remove greenhouse gases from the atmosphere, or otherwise accelerate the net-zero transition in a just manner. An example may be a company that produces green hydrogen or a project on regenerative agriculture.
- **Aligned**: Financing or enabling entities that are already aligned to a 1.5°C pathway. This strategy supports climate leaders and signals that the financial sector is seeking transition alignment behaviour from the real-economy companies with which it does business. An example may be a company with a SBTi-validated target and whose progress reports demonstrate achievement against the target or a company whose climate transition plan and performance is assessed by the World Benchmarking Alliance.
- **Aligning**: Financing or enabling entities committed to transitioning in line with 1.5°C-aligned pathways. This strategy supports both high-emitting and low-emitting firms that have robust net-zero transition plans, set targets aligned to sectoral pathways, and implement changes in their business to deliver on their net zero targets. An example may be a manufacturer who is implementing energy efficiency and clean energy projects to reduce its Scope 1 and 2 emissions or a retailer engaging with its supply chain to invest in Scope 3 emissions reduction projects.
- **Managed phase-out**: Financing or enabling the accelerated managed phase-out (e.g., via early retirement) of high-emitting physical assets. This strategy facilitates significant emissions reduction by the identification and planned early retirement of assets while managing critical issues of service continuity and community interests. GFANZ believes this activity is essential to reducing global emissions and supporting a smooth and just economic transition. An example may be an identified fossil fuel power plant with a plan in place for early decommissioning on a timeframe consistent with the broader net-zero trajectory."

Here again, this categorisation can, and has been questioned by other actors. This shows the wide variety of interpretations of what transition finance encompasses.

Transition finance strategies can encompass:

1. Financing or enabling assets and activities that are already sustainable ("green", "climate solutions");
2. Financing or enabling assets and activities that are transitioning and do not contribute to carbon lock-in. The latter relates to the theme of alignment, and can be split into sub-strategies, such as financing or enabling assets and activities with proper transition plans, targets and past performance;
3. Engaging companies that should transition but do not so, or not at an enough ambition/pace, and ultimately financing/enabling them if they transition, or stop financing them if they do not;
4. Not financing assets and activities that are not compatible with the transition.

Depending on the type of financial institutions and activities, this can take the form of reallocating financial flows and/or engagement. As detailed in part 1, these levers have been shown to have a different propensity to affect change in the real world, either at the individual level or through collective action. Putting in place these strategies therefore require deciding on what levers to use on what type of financial asset, depending on the broader financial strategy institutions pursue and types of financial assets and activities to which they are exposed.

Within the next section, alignment methodologies are reviewed and classified based on how they can be used to drive and monitor climate-related strategies and associated results. Other metrics and methodologies can feed into these strategies, such as emissions footprint, green brown shares, avoided emissions and the like, but these are beyond the scope of this report.

2.2 CATEGORIZATION OF PORTFOLIO-LEVEL TARGET SETTING METHODOLOGIES

Our classification of portfolio net zero targets is built based on a literature review (SSGA, 2022; Investor Leadership Network, 2022; Reclaim, 2021; PWC, 2022; WWF, 2021; AOA-SBTi, 2021; SBTi, 2022). Until recently, most classifications were limited to selected methodological features, such as the metric (absolute vs intensity) or the level of disaggregation of the benchmark used (global, sectoral). The work of 2° Investing Initiative on financial institutions' climate-related commitments (2° Investing Initiative, 2020), SBTi (SBTi, 2023) and GFANZ on transition finance (GFANZ, 2023) provide useful frameworks to go further, on which we base our classification.

We distinguish target-setting methodologies based on their focus.

First, it is possible to make a difference between targets that relate to the means put in place and targets that relate to the climate performance of financial flows.

- **Means-related targets** are set on the means put in place by financial institutions to reach their objective, implement their transition plan and/or to participate in the global net zero effort. These have taken the form of engagement, lobbying or product introduction targets as recommended in several Net Zero Target-Setting guidance/protocols/standards. GFANZ calls these "Plan execution targets" in its work on FI Transition plan and list metrics to "measure the progress in mobilisation of the institution to execute the net-zero transition plan", including but not limited to implementation, strategy and governance metrics (GFANZ, 2022).
- **Performance-related targets** are set on the climate performance of the financial flows under consideration, expressed through a range of variables. We focus on this type of targets and distinguish between portfolio emissions targets and portfolio alignment targets (table 4).

Table 4: Sub-categories of climate performance-related targets

Performance-related target sub-category	Description	Referenced in the following Net Zero Initiatives, target setting guidance/protocols/standards and alignment frameworks
Portfolio emissions targets	Focus primarily on the emissions associated with financial flows. They can focus on emissions reduction or carbon removals, be based on a range of metrics (absolute, intensity), apply at different-level of aggregation (sector, asset-class, activity, portfolio) and leverage different financial asset-to–aggregated level aggregation methodologies (ownership-based, weighted averages). *e.g. "decrease financed emissions by 50% to 2030 from 2020 levels"*	- PAII NZIF, NZAOA, NZBA emissions reduction targets (portfolio-wide, sub-portfolio-wide and/or sector-level) (PAII, 2021/2024; NZAOA, 2024; NZBA, 2024) - SBTI FINZ long term emissions reduction, maintenance, and portfolio neutralisation targets. (SBTi) - Notably, this includes emissions targets as detailed/recommended in GFANZ and other alignment frameworks such as the HLEG (GFANZ ,2022; HLEG, 2022)
Portfolio alignment targets **Also called portfolio allocation or composition targets**	Relate to increasing the share of financial flows towards financial assets that share a common set of characteristics, usually denoting the alignment status of the financial asset. The characteristics taken into account may vary, as well as the metric used and the type of alignment status targeted (net zero, aligned, aligning...). Portfolio alignment targets can be set using "input (capital deployed)" or "normative alignment output" metrics. Input metrics measure financial flows to financial assets that exhibit different attributes in relation to the transition. Output metrics focus on the alignment outcome to be attained, expressed for example by the Implied Temperature Rise of a portfolio. *e.g. "Increase share of financial flows to net zero or aligned financial assets to 30% by 2030"* *"Decrease portfolio alignment Implied Temperature Rise score to 1.5°C by 2050"*	PAII asset-level targets based on the NZIF or other maturity scale approach (PAII, 2021/2024). - SBTi FINZ alignment-based targets (SBTi) - SBTi portfolio coverage and temperature targets (SBTi). Notably, this includes targets and metrics on GZANZ aligned, aligning and managed phase-out transition strategies to support real-economy transition (GFANZ ,2022).
Financing targets (specific kind of portfolio alignment target using capital deployed metrics)	Focus on the activities directly financed through project finance and other asset classes with known use of proceeds, i.e. the individual projects of business activities, or indirectly financed through general purpose investments. **Financing targets usually focus on ceasing or decreasing fossil fuel finance, and increasing financial flows to climate solutions.** *"Increase kWh of renewable energy financed by 20% by 2025"* *"Cease financing of new fossil fuel projects by 2025"* *"Increase financing to climate solutions by 10% by 2025"*	These include climate solutions & fossil fuel exposure targets that are mentioned/recommended/mentioned in NZAOA, NZBA, NZIA, PAII NZIF and SBTi FI (NZAOA, 2024; NZBA, 2024; PAII, 2021/2024; SBTi). Notably this includes targets and metrics on GFANZ climate solutions. Financing-based targets, notably on climate solutions and fossil fuels, are also mentioned in multiple alignment frameworks (GFANZ ,2022).

We further detail how climate performance targets are set. Climate performance targets include three elements: **assessing the portfolio climate performance (input metric) and setting the ambition (rate of alignment) over a specific period (time horizon). We review these below.**

- **Portfolio emissions targets** focus primarily on the emissions associated with aggregate financial flows, at portfolio-, activity-, asset class- or sector-level.

Target-setting can focus on decarbonization, either through emissions' reductions following the pace and timing from a relevant 1.5°C pathway or maintaining emissions under a specific level, where a portfolio has already reached its required 1.5°C level.

Whilst less common, it can also focus on emissions' removal, either through residual emissions neutralisation at end-point, e.g. in 2050, or increasing removals associated with investments along the path to net zero.

Portfolio emissions first need to be quantified, using footprinting methodologies (see PCAF or GHG Protocol for best practices and limitations). Well-below 2°C or 1.5°C pathways are then used to set targets, "showing the pace and timing of GHG emissions reductions needed to meet the level of ambition" (GFANZ, 2022). Targets can be set over the short-, medium-, and long-term time horizon and using different metrics, such as absolute emissions or intensity metrics.

We discuss further the choice of pathway, metric and other design choices in part 3.

- **Portfolio alignment targets** relate to increasing financial flows to financial assets and activities that share specific desirable attributes in relation to net zero. **These are also called portfolio allocation or portfolio composition targets.**

These targets can be set using "input" (or capital deployed) or "expected alignment outcome" metrics[35].

Input (capital deployed) metrics relate to the volume of financial flows to financial assets that exhibit different attributes in relation to the transition (% of AUM, total AUM, amount of financing provided, number of clients).

Expected alignment outcome metrics focus on the normative alignment outcome at portfolio-level and can take the form of "reaching a portfolio temperature of 1.5°C by 2040". While the target is set on the output, it is implicitly linked to the proportion of financial flows into financial assets that exhibit different attributes in relation to the transition.

Setting this type of targets first necessitates ascertaining the alignment of portfolios and/or financial assets, for example using alignment assessment methodologies. While an increasing number of actors are calling for this type of targets and analysis because of its more direct link to the transition, the segmentation of different alignment categories, the attributes that portfolios and financial assets should exhibit to be classified in one category or another, and the approach to assess these attributes are far from being consensual (see section 2.5 for a review).

Historically, portfolio coverage targets have been used[36] - set on the share of financial flows to assets that have set science-based targets. These can be considered the simplest form of alignment targets. Yet, these apply only to corporate assets, can be considered simplistic and does not capture the share of assets already near, or at their net zero level. For this reason, more sophisticated approaches have been developed, building and extending on portfolio coverage targets, such as the PAII NZIF asset-level targets based on maturity scales.

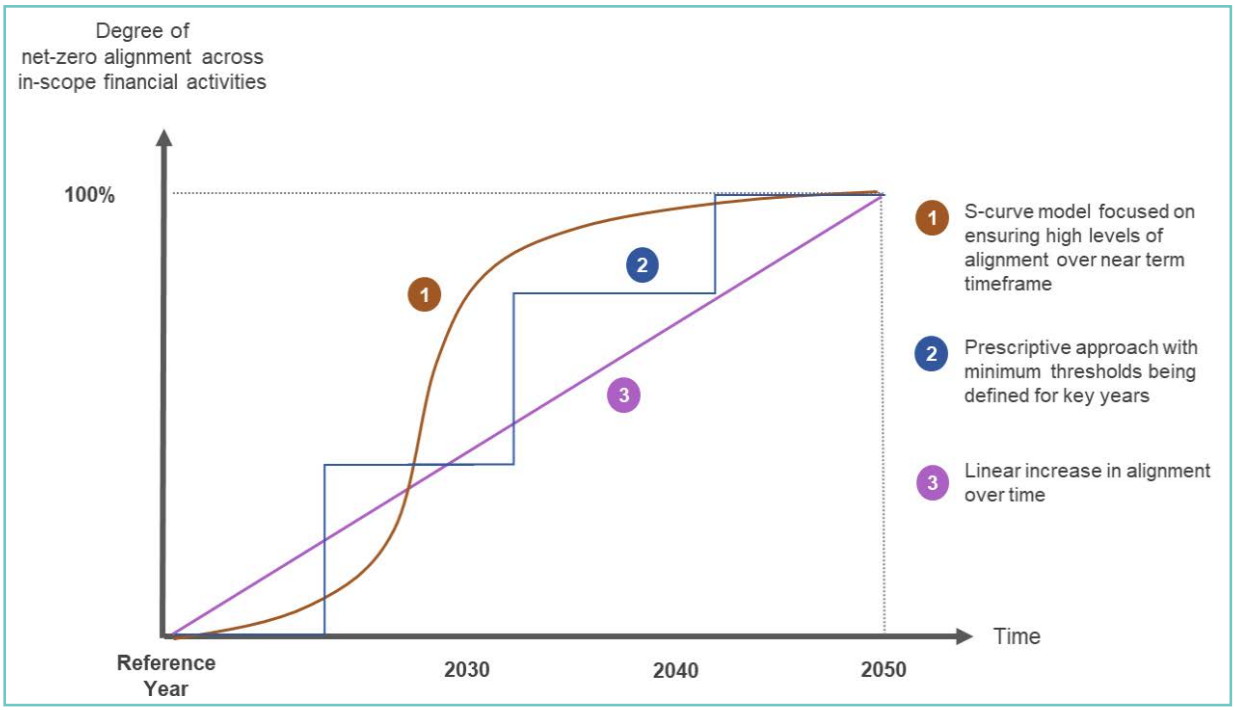
Unlike with portfolio emissions targets, the determination of how quickly financial flows should be increased toward financial assets and activities that exhibit desirable attributes related to net zero for the global remaining carbon budget to be respected cannot be "easily" derived using a scenario-based approach. The rate can, however, be broadly inferred from transition scenarios' pathways shapes and characteristics.

For example, most science-based pathways show that global carbon emissions need to reach net zero by 2050 to limit temperature rise to 1.5°C: this can be interpreted as 100% of financial assets within a portfolio need to *have already achieved* net zero carbon by 2050 at the latest. From there, it is possible to assume differently-shaped pathways to derive what the share of financial flows to aligned financial assets should be at different point-in-time (see figure 24 and SBTi, 2023 for a more detailed discussion).

We review the different sets of attributes financial assets and activities are required to share in relation to net zero within a range of classification systems in part 2.5.

35 UNEP, FI 2023 makes the distinction between input and output KPIs in its work on Transition Finance metrics.
36 As detailed in SBTi for FI.

Figure 24: Stylised pathways for portfolio alignment targets (SBTi, 2023).



- **Financing targets** usually focus on ceasing or decreasing fossil fuel finance, and increasing financial flows to "climate solutions".

Financing targets could technically be considered "alignment" targets[37] given that the financing choice is related to the perceived (in)compatibility of a specific activity or financial asset with net zero. However, it appears useful to create a specific target category given that these targets correspond to well-defined and widely-used target-setting approaches and transition strategies, and draw attention to financial assets and activities that are very relevant to the global climate challenge.

The criteria used to decide which specific activity should be ceased on the one hand and what qualifies as climate solutions on the other is determined using a range of approaches, from third-party guidance (e.g. Reclaim Finance, SBTi fossil fuel target guidance in SBTi FINT, pilot testing version, 2023) to Taxonomies (EU Taxonomy on sustainable activities, 2020). The rate of ambition can be set using scenario-based pathways where available, inferred from the scenario's characteristics or set on a normative basis. For example,

- Technology exposure pathways are available for a set of technologies in specific sectors. The most common relate to 1. The extraction and use of fossil fuels by type (e.g. coal, oil and gas), 2. Electricity generation by type, 3. Electric automobiles penetration, 4. Transport by type (e.g. electric, hybrid, combustion) (PACTA, 2022; PACTA, 2022; IIGCC, 2022). The alignment of fossil fuel and energy sectoral policies with 1.5°C and carbon neutrality commitments can be analysed by relying on the science-based recommendations of CSOs (Coal Policy Tracker, Oil and Gas Policy Tracker and Sustainable Power Policy Tracker).

- Scenarios can be used to infer the characteristics of divesting targets, such as time horizon. For example, the IEA mentions that unabated coal should be phase-out in advanced economies by 2030 at the latest in its NZE 2050 scenario (IEA) - this type of information can be used in divesting target designs. It should be however highlighted that, as financing precedes production, such milestones should be seen as **under-conservative maximums**. The significant decrease of production required before these milestones should be translated in a reverse-planning for financial flow reductions[38], particularly in CAPEX and with more smoothing for OPEX. Such in-depth analysis is yet to emerge as most financial institutions stick in practice their phase out commitments to the abovementioned milestones.

- Finally financing targets can be set on a normative basis. This has mostly been used for climate solutions and involves "guessing" what an appropriate rate of increase in climate solutions investments should be through time. As noted by the IIGCC on the topic of climate solutions (IIGCC, 2022), "to date, however, there has been limited data on how net zero investment needs translate to a portfolio's level of green investment, thereby impairing investors' ability to set credible, science-based investment targets".

37 and more particularly alignment targets on capital deployed (input).
38 For instance signing a finance deal in December 2039 for a brand new thermal coal power plant wouldn't make sense as it is obvious that it won't be decommissioned one year later. Such behaviour from the FInancial Institution would contradict the NZE 2050 scenario from IEA.

The IIGCC work on Paris-aligned climate investment roadmaps (2022) and climate solutions guidance (2023) are interesting resources on the topic (IIGCC, 2022 & 2023).

Table 5: Setting climate performance targets - examples

Climate performance target type	Input metric and source	Rate of alignment – how is the ambition for target-setting derived?
Portfolio emissions targets	Portfolio emissions footprint See PCAF and GHG Protocol for guidance.	Scenario-based – using 1.5°C or well-below 2°C pathways to set the pace and timing of decarbonization required.
Portfolio alignment targets	Portfolio alignment. Based on portfolio alignment methodologies (see p.59 **for a detailed classification**). Can focus on the "inputs" (capital deployed) or "output" (normative alignment outcome).	Normative pace and timing, such as "100% of financial flows should be towards financial assets that have achieved their net zero levels by 2050" or "achieve 1.5°C portfolio by 2040" or "have a validated science-based target".
Financing targets	Portfolio exposure to predetermined activities/ sectors. Taxonomies, other third-party criteria and guidance e.g. on fossil fuels. For climate solutions, may be expressed using avoided emissions metrics	Depends on the activity/sector and approach: - Scenario-based pace and/or timing of financing for activities that correspond to technologies in transition scenarios: mix and fleet size of vehicles, energy mix, capacity and production… e.g. *"Increase financing towards renewable energy by X% by X"* *"Cease fossil fuel financing by 2030"* - Normative pace and/or timing for other activities with no scenario available, until further scenario work becomes available. *e.g. "Increase financing to climate solutions by X by X"*

2.3 SETTING TARGETS TO DRIVE THE TRANSITION

Recently, portfolio alignment targets have received increasing interest. While decarbonization targets remain the most common, this can be explained by 1. A realisation that decarbonization targets, if not properly designed, are not efficient to drive real-world decarbonization and may even be counterproductive in terms of driving the transition, 2. The recent focus on transition plans and transition strategies, and the need to set targets that adequately reflect financial institutions' levers of change.

It is worth noting that portfolio emissions and alignment targets can support financial institutions transition strategies in different, yet complementary, ways.

- **Portfolio emissions targets focus on the long-term outcome of financial institutions' strategies.** Indeed, these targets are directly linked to the global challenge which consists in decarbonizing and neutralising remaining emissions. These approaches are well-suited to act as an accountability, monitoring objective – ensuring that the reorientation of financial flows leads to the right level, in terms of pace and scale, of portfolio emissions decarbonization. As such, SBTi FINZ considers portfolio emissions target as a "lagging approach" (SBTi, 2023). They need to be carefully designed to ensure that they act as a robust compass to implementing transition strategies. This may involve selecting a longer time horizon and/or setting a target over cumulative, rather than point-in-time, emissions – as the implementation of certain transition finance strategies may, on the short-term, result in increased emissions (see table 6).

- **Portfolio alignment targets are better suited to support the range of transition strategies that financial institutions can follow in aligning their activities to the net zero planetary objective** – as such, SBTi FINZ consider portfolio alignment as a "leading approach" (SBTi, 2023). For example, if well-designed, alignment targets are better suited to strategies that consist in investing in currently high-carbon assets that have adequate transition plans to decarbonize. Sector-specific financing targets can complement pan-sectoral alignment targets to further emphasise climate solutions investments and fossil fuels divestments.

Table 6: Examples on the interplay between four key financing strategies and portfolio emissions (GFANZ, 2022).

KEY FINANCING STRATEGY	EXAMPLE IMPACT ON PORTFOLIO EMISSIONS (NOT EXHAUSTIVE)
1. Climate solutions	• If a portfolio company meets increased demand for its low-emissions technology, its own emissions could likely increase and the financial institution's overall portfolio emissions may increase proportionally. • Conversely, if entities using low-emissions technologies are included in the financial institution's portfolio, overall portfolio emissions could decrease as the technology is deployed.
2. Aligned	• Portfolio emissions could decrease as more companies or clients in the portfolio are aligned to net zero.
3. Aligning	• Portfolio emissions could increase with the addition of more high-emitting real-economy firms that are just beginning to transition. • As firms execute their net-zero transition plans, reductions in portfolio emissions in line with 1.5 degrees C-aligned pathways take place.
4. Managed phaseout	• Portfolio emissions may initially be higher if the financial institution is financing high-emitting assets with plans to accelerate their retirement. • Significant reductions in portfolio emissions may only occur as the phaseout plan is completed.

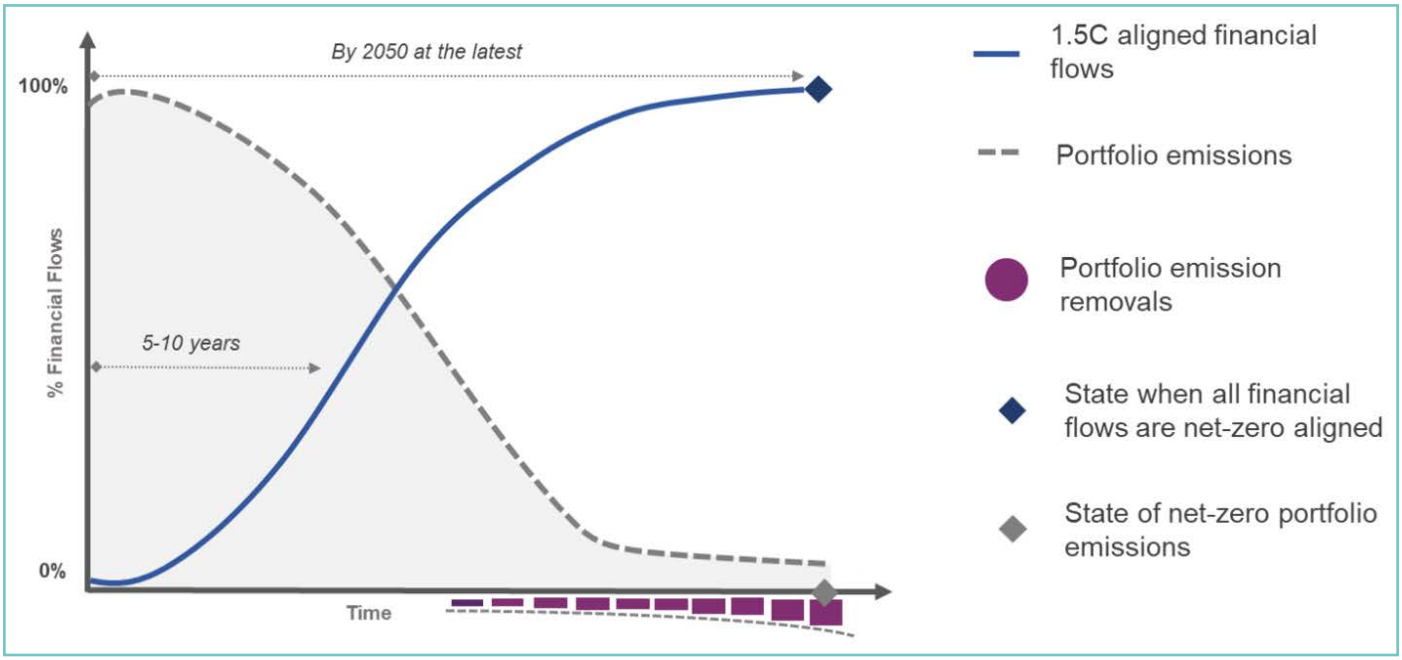
Portfolio alignment and emissions targets are theoretically complementary. Alignment approaches focus on ensuring that all financial flows go to financial assets and activities that have achieved net zero by 2050, as required in article 2.1.c of the Paris Agreement. In the short term, portfolio emissions could increase as financial institutions deploy transition finance strategies such as investing in emissions-intensive assets that are transitioning. But over the medium to long-run, as financial assets transition to ultimately reach their net zero level, portfolio emissions should mechanically decrease to a level near net zero by 2050, provided that the actions implemented by real-economy actors have delivered as expected, which bears important uncertainty.

The challenge remains to link portfolio alignment targets to the global macro budget. Research is still nascent on the characteristics portfolio alignment targets need to exhibit to effectively support the transition. These concern:

- The attributes to be taken into account to ascertain the alignment status of financial assets and portfolios, from uni-dimensional, simple methods such as Portfolio coverage, relying only on the presence of validated science-based targets, to multi-dimensional methods, such as maturity scale approaches.
- The determination of how quickly financial flows should be increased toward financial assets and activities that exhibit desirable attributes related to net zero for the global remaining carbon budget to be respected.

Approaches are emerging to translate portfolio alignment targets into projected portfolio emissions' change, thereby linking the two (GFANZ, 2023). Yet, this may prove quite challenging to do. For financial institutions themselves, it may require a lot of time and resources. For external stakeholders, it may require information on alignment targets that is seldom available and diverges across actors, which use a wide range of "alignment" definitions and criteria to assess alignment.

Figure 25: Relationship between 1.5°C aligned financial flows and portfolio emissions – modified from SBTi (SBTi, 2023).



It can be highlighted that re-orienting financial flows doesn't automatically translate into GHG emission reductions. If one takes a "vanilla example" of a financing infrastructure: first the infrastructure is financed, then built, and then only the expected output in terms of GHG emission reduction can materialise. Such a process can take a few years and bears uncertainty on the actual GHG reductions vs. forecasted ones. As presented above, other cases don't even allow clear causality effects between investments and decarbonation. Thus, from the graph above one could highlight that there would be at least a delay of a few years between 1.5°C aligned financial flow increase and portfolio emissions decrease.

Setting multiple targets may be an effective way to better link portfolio decarbonization to the decarbonization of financial assets in the real economy, at least in theory, and is increasingly recommended (see Reclaim Finance, 2023).

Several target-setting guidance recommend setting multiple targets, often across the different target types identified in this section. For example, SBTi FINZ (2023), the NZAOA (2024) and the NZIF (2024) target-setting guidance require a mix of targets; financial institutions following the NZBA target-setting guidance (2024) can set one target at minimum. All target-setting guidance give some latitude to their users in terms of choosing amongst a predefined set of targets.

- **Portfolio emissions targets**: Financial institutions following the NZAOA, PAII NZIF and NZBA target-setting guidance have to set at least one type of emissions target to 2030, either at (sub) portfolio- or sector-level. Emissions targets are optional in SBTi FINZ over the short run (2030) and required over the long-run (2050).

- **Portfolio alignment targets**: Both the PAII NZIF and SBTi FINZ require setting alignment targets. It is optional within NZBA.
- **Financing targets:** All target-setting protocols to guidance mention financing targets. Both the PAII NZIF and NZAOA require climate solutions, or financing the transition targets. SBTi FINZ includes climate solutions within its alignment targets frameworks. There is less consensus on fossil fuel targets: only the SBTi FINZ is prescriptive[39].

Similarly, methodologies that seek to assess financial institutions transition plan alignment also integrate considerations relating emissions, alignment and financing targets, although framed sometimes in different ways (e.g. ACT Finance, TPI Management Quality module for banks).

Finally, alignment frameworks most often mention portfolio emissions targets as a necessary component of financial institutions' transition plans. Climate solutions and ceasing fossil fuel finance is also mentioned, but other types of portfolio alignment targets are seldom discussed.

Table 6: Target mix as required/recommended in various target-setting guidance/protocols/standards, alignment frameworks and FI transition plan alignment assessments.

Methodology (non exhaustive)	Recommended/required target mix
Target-setting guidance/protocols/standards	
NZAOA TSP (2024)	The NZAOA Target-Setting Protocol is written in such a way that NZAOA members have to set at least one emissions-based target (minimum expectation). Other targets include financing the transition and engagement.
NZBA Guidance (2024)	The NZBA requires absolute emissions and/or sector-specific emissions reduction targets. Users of the TSP can, but are not required, to set additional types of targets (e.g. "committed or underwriting amounts, ITR, portfolio coverage, capacity evolutions, technological mix").
PAII NZIF (2021/2024)	The NZIF recommends setting both emissions-based and alignment targets at asset class level, using the maturity-scale developed by the initiative for each asset class. The NZIF also includes a climate solutions target.
SBTi FINZ Guidance (2023)	SBTi FINZ is the only target-setting protocol that requires different targets for short- and long-term. In the short-term, portfolio financial flows targets are required, together with activity-level targets aligned with the SBTi Fossil Fuel finance policy, and emissions-based targets optional. In the long-run, both portfolio financial flows and emissions-based targets are required, as well as portfolio emissions neutralisation targets.
Financial institutions transition plan alignment assessments	
ACT Finance (ACT)	There are two ACT for Finance methodologies: one for investing and the other for banking activities. Module 1 of the methodology assesses both the alignment of portfolio emission targets and the quality of non GHG targets (engagement targets, climate solution financing targets and exclusion targets). While it does not rate directly portfolio alignment targets, Module 4 rates financial flows past trends, through the share of financial flows dedicated to low-carbon/in-transition activities or companies. In order to tackle the issue of variability of definitions and methodologies, amounts recognized by the FI as low carbon/in transition are weighted more or less following a qualitative evaluation of the identification framework used by the FI. Other modules tackle qualitative aspects such as management (including risk) and engagement strategy and activity.

39 Other NZ have fossil fuels policies but do not require ceasing financing targets or measures

TPI Banking tool (2023)	The assessment rates the presence of portfolio emissions targets (indicator 2.1), targets to increase the share of financing/facilitating financial flows to 1.5°C-aligned assets (Indicator 5.1.2/3), commitment to scale up finance directly towards climate solutions, with specific targets and milestones (Indicator 6.1.a) and divestment commitment from fossil fuels and deforestation (indicator 5.2.1/2), along-side other means-based commitments/ targets. The carbon performance module that aims to rate sector-level decarbonization targets.
Alignment frameworks	
GFANZ (2022) & TCFD (2021)	GFANZ recommends establishing a suite of metrics and targets to drive execution of the net-zero transition plan and monitor progress of results in the near, medium, and long term. Include metrics and targets focused on aligning financial activity in support of the real-economy net-zero transition; on executing the transition plan; and on measuring changes in client and portfolio GHG emissions.
HLEG - Integrity Matters (2022)	The High-Level Expert Group recommends that non-state actors must have short-, medium- and long-term absolute emissions reduction targets and, where appropriate, relative emissions reduction targets across their value chain that are at least consistent with the latest IPCC net zero greenhouse gas emissions modelled pathways that limit warming to 1.5°C with no or limited overshoot, and where global emissions decline at least 50% below 2020 levels by 2030, reaching net zero by 2050 or sooner.
TPT (AM, 2023, AO, 2023, Banks, 2023)	An entity shall disclose information about any financial metrics and targets, relevant to its business, sector and strategy, that it uses in order to drive and monitor progress towards the Strategic Ambition of its transition plan, and report against these metrics and targets on at least an annual basis.

Which climate performance targets are most used by financial actors?

A range of publications, including the Net Zero Alliances progress reports, review the types of targets taken by financial institutions. One issue is that few consolidated figures exist that show the repartition between portfolio emissions and portfolio alignment targets, given how recent this terminology is. Still, a number of recent publications showed that financial institutions usually use a mixture of targets, including portfolio alignment targets:

- A report from the French Observatoire de la Finance Durable on the reporting of 30 French asset owners, managers and banks, show that most of the financial institutions reviewed usually set multiple objectives, and note that this is a good practice. In particular, 57% of them have set portfolio alignment targets. This figure hides discrepancies across the type of actors, from 100% of the 11 asset managers reviewed to none of the 7 banks reviewed (OFD, 2023).
- Conducting a global survey of over 300 asset owners and consultants, Ninety One found that asset owners mostly use emissions-reduction targets (49%). In North America, 40% use portfolio coverage and asset-level alignment targets, and in Europe 44% Implied Temperature rise targets (Ninety One, 2023)[40].
- 51% of the NZAM signatories used the PAII NZIF frameworks to set targets - over half of them (62%) setting alignment targets and 82% portfolio emissions targets (GFANZ, 2023).
- 68 out of the 69 of the NZAOA members have set climate solutions targets according to the latest climate report (NZAOA, 2023). 22 out of the 30 GlobalSystemically Important banks reviewed by the European Central Bank (ECB, 2023) have set “green financing targets”. Yet, “There are a wide variety of financing commitments by banks in the sample, which makes it not only challenging to compare the targets and the ambition of those targets, but also to assess the level of effort needed to achieve them.” Similarly, ShareAction found that the green finance targets and reporting of 20 European banks are far from normalised, hard-to-compare and often lack transparency (ShareAction, 2023).

Classifying the types of targets used by financial institutions is of course far from sufficient to evaluate their completeness and adequacy. All of the resources cited above deep-dive into additional details such as timeframe, perimeter and coverage.

40 These targets are specific types of alignment targets, see table 4.

2.4 CATEGORIZATION OF ALIGNMENT ASSESSMENT METHODOLOGIES

Alignment assessments consist of methodologies that aim to assess the "alignment", or "compatibility" or "consistency" of financial assets and/or portfolios with (a) given pathway(s) that limits global temperature rise under a specific level with a certain probability.

Alignment assessment often seek to capture the proximity between the climate performance of a financial asset and/or portfolio, for example through its carbon footprint, the share of its investments in so-called "green" companies or climate scores, and one or several temperature benchmark(s) chosen or built based on one or several of temperature trajectories. This proximity is expressed using a range of output metrics (ILB, 2020).

As put by the IMF, "portfolio alignment tools 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" (IMF, 2023).

Alignment assessment results can be used by financial institutions[41]:

- As an input metric for target-setting purposes, when setting portfolio alignment targets (see sections 2.2 and 2.3).
- To monitor (and communicate) progress against pre-set targets (including portfolio emissions and alignment targets).
- As a tool to support appropriate decision-making in relation to the net zero objective, such as identifying financial assets and topics on which to focus engagement or include within aligned portfolio products.

External third-parties can also use alignment assessments to assess the adequacy of financial institution's targets, for example within broader Financial institution-level transition-plan assessment methodologies (see p.29).

Alignment assessment methodologies have historically been classified according to their focus and output metrics (TEG, 2019; Novethic, 2019; GFANZ, 2022; PAT, 2020; PAT, 2021):

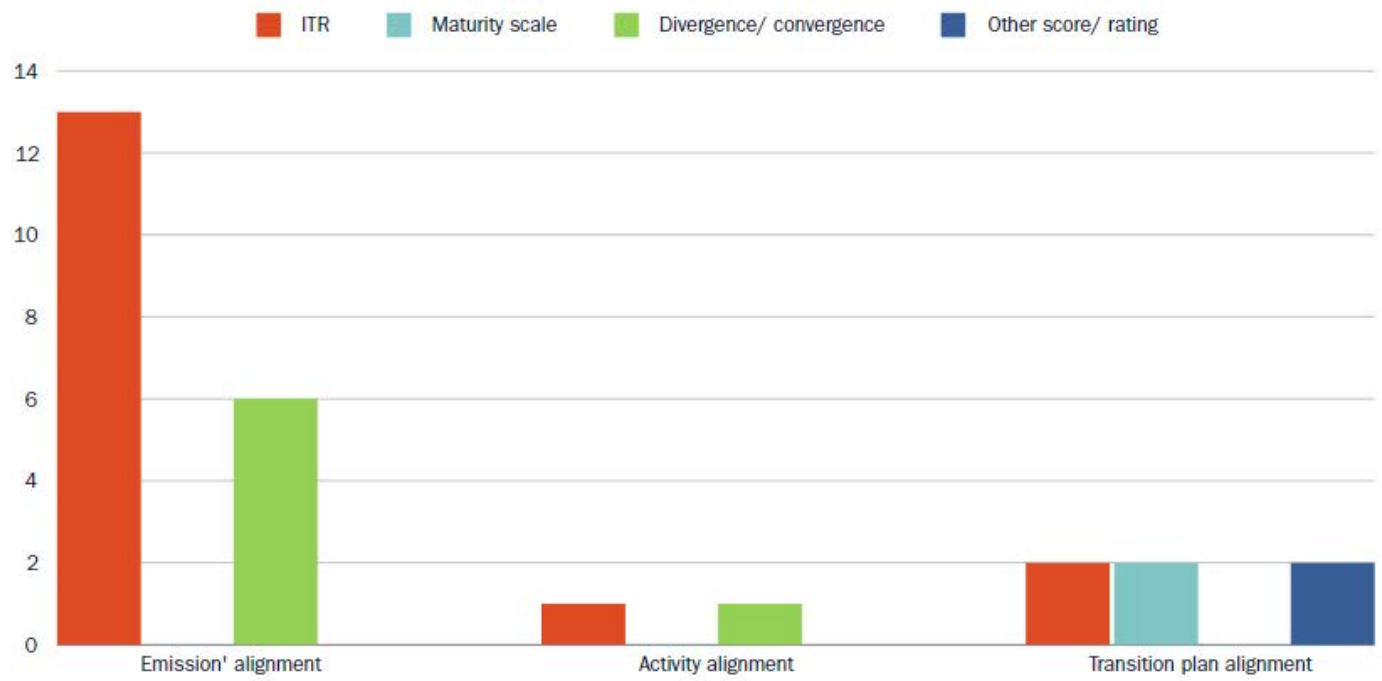
- Alignment assessment methodologies can be classified based on their focus: emissions, activities and/or transition plan alignment. These categories broadly correspond to GFANZ categories except that we add the third category, transition-plan alignment, to account for alignment assessment methodologies whose *primary* objective is to evaluate the alignment of a financial asset, and by extension financial portfolio, through the quality of its transition plan and global approach to net zero[42] (GFANZ, 2022).
- The GFANZ Portfolio Alignment workstream[43] (PAT, 2020; PAT, 2021; GFANZ, 2022) identified four types of output metrics, namely binary, benchmark divergence, implied temperature rise scores and maturity scale. Based on our review, we identify a fifth type of metrics, which we call "alignment scores". We slightly adapt definitions in table 7 below to reflect the range of practices found in our review of 50+ methodologies.

41 This is broadly in line with the GFANZ Portfolio Alignment workstream identification of use cases for portfolio alignment metrics, except that we add an additional one: target-setting. The Portfolio alignment workstream identified seven potential use cases for portfolio alignment metrics, "the choice of which depends on the type of end user and the user's objectives", broadly assigned to "two fundamental purposes": decision-making and communication.
42 This is different from integrating considerations on the quality of transition plans and net zero approach in projecting emissions, as recommended by the GFANZ Portfolio Alignment workstream on its work on alignment methodologies.
43 Previously the TCFD Portfolio Alignment Team.

Table 7: range of focus and output metrics used in alignment assessment methodologies.

Focus/input metric	Output metric (adapted from PAT, 2020; PAT, 2021; GFANZ, 2022)
Emissions-alignment methodologies focus on past, current and/or projected emissions alignment. Activity-alignment methodologies focus on past, current and/or projected activity alignment, using for example such as green brown or taxonomic shares, captured through revenue, production, or other metrics. This is the equivalent of GFANZ transition-based metrics. Technology-alignment is a special form of activity-alignment. Transition-plan alignment methodologies focus on the quality of a financial asset's transition plan and global approach to net zero. These methodologies usually rely on a range of qualitative and quantitative criteria, at least one of which is often assessed using emissions-alignment (e.g. assessing decarbonization target's alignment) or activity-alignment methodologies[44] (e.g. assessing CAPEX alignment). Notably, the boundaries of these three categories are porous – for example, emissions-alignment methodologies may incorporate input data relating to the quality of a financial asset's transition plan and vice versa.	Binary metrics can be expressed using Y/N, and often, but not always, reflect the percentage of portfolio companies with validated science-based emissions reduction targets. Benchmark divergence metrics can be expressed as a percentage deviation, or absolute emissions/technology overshoot over/below the 1.5°C or well below 2°C benchmark. The resulting metric indicates how far the projected company [or portfolio] [climate performance] are overshooting or undershooting this benchmark. Implied Temperature Rise scores build on the benchmark-divergence model in that they translate the (in)compatibility of a company's or portfolios past, current and/or projected climate performance with its benchmark and express it using a temperature metric. Maturity scale metrics consist in classifying financial assets and portfolios in alignment buckets corresponding to different maturity levels. This requires listing a set of attributes that a financial asset or portfolio must exhibit to be considered within a specific category. Scores are usually set on a continuous alphabetical or numerical scale and are built by weighting different criteria. The relationship between a financial asset's or portfolio's performance on specific criteria is therefore less direct than within maturity scale methodologies.

Figure 26: Count of reviewed methodologies by focus and output metric (corporates) - Note: one methodology can lead to several outputs.



44 All transition plan alignment methodologies do not include emissions- or activity-alignment sub-criteria. By definition, we include in our detailed review only those who do (See "Detailed review of Alignment methodologies" for more details).

How to reconcile alignment assessments that have different focuses?

Most alignment frameworks usually recommend, directly or indirectly, assessing alignment using both emissions- and activity-alignment approaches where possible. In addition, most recommends to complete with additional analysis on transition plans' quality, to capture the multiple dimensions of alignment and maximise real-world decarbonization when using the output in transition strategies.

As put by SBTi, "selecting appropriate metrics, both emissions- and non-emissions-based will be key for ensuring that net-zero aligned activities, and other activities that enable wider economy decarbonization, are properly reflected and incentivized as part of net-zero targets." (SBTi, 2023).

- Activity alignment methodologies put more emphasis on the technological transformations needed for the transition, emissions-alignment methodologies on the outcome. Both can be embedded in wider transition-plan alignment assessments.
- Decarbonization targets are assessed, by definition, using emissions-alignment methodologies, while CAPEX alignment is best measured using activity-pathways.
- Activity-alignment methodologies are better suited to set and monitor financing targets that focus on climate solutions and/or divestments.

It is worth remembering that when taken from the same scenario, activity-alignment and emission-alignment can be seen as the two sides of the same coin: everything else being equal, the alignment assessment result would be the same provided the perimeter is the same and all activities are taken into account. Therefore, in theory, the results of alignment assessments based on activity and emissions pathways taken from the same scenario would be directly comparable, *provided that all other assumptions and design choices are similar*.

Transition-plan alignment assessments incorporate a range of criteria, at least one of which is often assessed using emissions-alignment (e.g. assessing decarbonization target's alignment) or activity-alignment methodologies[45] (e.g. assessing CAPEX alignment). These methodologies also include additional criteria seeking to capture whether an organisation is deploying the right internal processes and strategies to reach their net zero ambition.

While integrating these additional criteria increases the complexity of these methodologies, both in terms of deploying and interpreting them, they are increasingly recognized to be better suited to assess whether an entity is transitioning. For example, the IIGCC's first ask in its vendors' expectation paper is: "Investors expect private vendors to offer data on a range of criteria, such as CAPEX alignment, transition plans and net zero ambition, and not to limit their alignment offerings to GHG emissions and decarbonisation targets" (IIGCC, 2023).

Provided that assumptions are the same and that an appropriate weighting methodology is used to aggregate the different criteria to produce a transition-plan alignment result, financial assets and portfolios considered aligned in transition-plan alignment methodologies are likely to be considered aligned in emissions-alignment and activity-alignment methodologies.

45 All transition plan alignment methodologies do not include emissions- or activity-alignment sub-criteria. By definition, we include in our review only those who do.

2.5 ASSESSING ALIGNMENT TO DRIVE THE TRANSITION

There has been recent, but rapid, developments on the topic of metrics and tools that support financial institutions in devising, implementing and monitoring their transition strategies (GFANZ, 2023; UNEP FI, 2023).

The increased focus on transition finance yields the question of whether and how alignment assessments complement the suite of already-existing and emerging tools to build, support and monitor transition strategies and their associated results.

Putting in place transition finance strategies relies on the classification of financial assets into different categories in relation to the transition, or **alignment categories**. Work is nascent but rapidly evolving in that field (WBA, 2023; CBI, 2023; GFANZ, 2023).

For example, the SBTi (2023), PAII NZIF (2021/2024), Climate Bonds Initiative (CBI), GFANZ (2023) and the Sustainable Markets Initiative's Asset Manager and Asset Owner Task Force (SMI AMAO) have developed frameworks which include, for most of them:

1. a mapping of alignment categories in which financial assets can be classified;
2. a list of attributes for financial assets to be classified in each of the categories, and;
3. guidance on how to assess attributes.

Guidelines on the above elements vary across frameworks. Yet, it is possible to identify broad convergence on the following categories:

- "Climate solutions" broadly designates assets that participate in the "elimination, removal, or reduction of real-economy GHG emissions or that directly support the expansion of these solutions (GFANZ, 2023)[46]".
- "Achieved net zero" usually designates assets that have already reached their scenario-based 2050 emissions level (and are expected to remain at this level).
- "Aligned performance" usually designates assets whose past, current and/or projected climate performance is evolving in line with low-carbon pathways in terms of rate and pace. It usually involves assessing the robustness of transition plans, targets and whether assets have met their targets in the past.
- "Aligned targets" usually designates assets whose targets or activities are in line with low-carbon pathways in terms of rate and pace. This category is sometimes called "Aligning".
- The above two categories correspond to assets that are transitioning.
- "Managed phase-out" designates highly-emitting assets that need to be phased-out (GFANZ, 2023).
- "Not aligned", which includes by default assets which should be aligned but are not yet, without credible signal leading to consider they would be one day.
- Others, including notably assets that couldn't be classified elsewhere. It is worth noting that some frameworks use a global "other" category that could embed both assets for which climate is not a material topic and assets that are "not aligned" according to the above-mentioned definitions. This could be seen as problematic as it does not allow to differentiate between the share of "inaction/not-enough action" of the portfolio.

The above classification comprises a mixture of static and dynamic categories. For example, most categorisation frameworks integrate a "climate solutions" category, referencing Taxonomies such as the EU Taxonomy on Sustainable Activities. This is useful because "even if ultimately, the emissions from these activities must be brought down to net-zero levels over time also, in the near term, capital is required to support their growth" (SBTi, 2023).

The other categories, focussing on transitioning assets, are defined dynamically rather than statically using thresholds, and correspond to "stages" of alignment. Therefore, they differ from "Transitional activities" as defined in threshold-based taxonomies such as the EU Taxonomy. It remains to be seen how the advent of Transition Taxonomies that integrate forward-looking elements in their approach, such as the "measures-based approach" of the Singapore-Asia Taxonomy, intersect with the above categories (MAS, 2023).

46 Specific definitions vary across frameworks.

Table 8: Alignment maturity scales, selected categories and attributes in select frameworks (non-exhaustive). See GFANZ (2023) for a mapping of other frameworks' categories, including CBI (2022, 2023), ICAPs expectation ladder (2023), SMI AMAO (2023), Initiative Climat International (iCI) and Sustainable Markets Initiative Private Equity Task Force — Private Markets Decarbonisation Roadmap (PMDR) (2023), Transition Plan Taskforce (TPT) (2023, Transition Planning Cycle), U.S. Department of the Treasury — Principles for Net-Zero Financing & Investment (2023).

Classification system	Category 1	Category 2	Category 3
High-level definition	Current emissions are at 2050 net zero levels	Demonstrating alignment to 1.5°C pathways	Demonstrating aligned targets to 1.5°C
PAII NZIF Maturity Scale for corporates (PAII, 2021/2024)	Achieved net zero: Current emissions at/ close to 2050 net zero level + have an investment plan/ business model in line with net zero.	Aligned: High-impact companies: Have a long-term ambition; short- and medium-term targets in line with 1.5°C; past performance in line with targets; emissions disclosure; adequate transition plan and CAPEX in line with 1.5°C.	Aligning: Short- and medium-term targets in line with 1.5°C; emissions disclosure; and presence of a transition plan. Also includes: Committed to aligning: Have a long-term ambition
SBTi FINZ Type of alignment (meta-criteria to be published in 2024) (SBTi, 2023)	Net zero aligned/ Achieved net zero end state: Assets: entities operating at a performance level consistent with a net-zero end-state (e.g., companies who have achieved a state of net-zero).	1.5°C transition/1.5°C aligned performance Assets: entities that are demonstrating alignment to 1.5°C pathways (e.g., companies demonstrating credible decarbonization in line with 1.5°C pathways).	1.5°C aligned transition/Aligned ambition Assets: entities that are covered by a clear 1.5°C aligned ambition (e.g., companies with credible 1.5°C aligned targets, or 1.5°C implied temperature rise score using credible methodologies).
GZANZ Transition Finance strategies key attributes (GFANZ, 2022)	Sub-category of GFANZ "Climate solutions" Climate solutions have their own attributes - decarbonization can be assessed using "aligned" and "aligning" categories attributes.	Aligned: Net zero commitment or ambition; emissions-based targets & KPIs; Additional KPIs; Net zero transition plan established and implemented; Alignment to pathways at least 2 continuous reporting cycles or years Managed phase-out assets have their own attributes adapted from the "aligned" and "aligning" categories.	Aligning: Net zero commitment/ambition; Emissions-based targets & KPIs; Additional KPIs; net zero transition plan established; Convergence towards pathways

Understanding under what alignment categories financial assets, and by extension portfolios fall, is important for target-setting and/or planning transition strategies. The SBTi highlights the importance of understanding "what counts" as alignment (SBTi, 2023):

- The composition of portfolios (and associated targets) need to change through time – on the short-run, the main focus of financial institutions may be to increase the share of financial assets with aligned targets and/or performance – while on the longer-run, the focus must shift to increasing the share of financial assets that have already achieved their net zero level.
- Classifying financial assets and portfolios in alignment categories allows financial institutions to set a range of transition strategies, such as scaling up financial flows towards financial assets that are already at, or near their 2050 net zero level and/or financial assets that are currently emissions-intensive but are on the right path to net zero, considering a range of factors such as historical decarbonization and transition plans.

Similarly, when using alignment assessment for monitoring and reporting purposes, it is also essential to understand what counts as alignment for the results to be interpreted adequately. For example, an alignment methodology can capture the *current gap* between the portfolio's emissions and its "aligned" 2050 level, or the projected gap to 2050 taking into account how the portfolio's climate performance is expected to evolve through time, keeping the portfolio composition constant, based on its' underlying financial assets historical emissions, targets and other elements.

Classifying financial assets into alignment categories requires combining a wide range of data points to assess each attribute. Alignment assessment methodologies' output can be one of these data points. In particular, alignment assessments may be useful to identify and classify transitional financial assets into the different stages of alignment.

Yet, the Alignment Cookbook found that alignment methodologies' results differ because they all answer slightly *different questions* due to the design choices made (ILB, 2020). A number of these design choices correspond to different views of "what counts" as alignment.

Different alignment methodologies attribute a rating of "aligned", or "1.5°C" to financial assets that are at different stages of alignment, putting implicitly in the same buckets financial assets and portfolios that exhibit different characteristics in the face of the transition. For example, financial assets are rated "aligned" or "1.5°C" in certain methodologies because they have an "aligned" target, whereas in others the financial assets' past and current performance also need to be aligned.

Currently, very little research exists on how the output(s) of different alignment methodologies built on specific design choices can be used as data sources to assess the different attributes used to classify financial assets into alignment categories.

Alignment methodologies that integrate multiple criteria relating to a financial assets' transition plan and journey, and result in a maturity scale output, classify financial assets within different alignment categories and can be used directly, at least in theory, as long as the methodology is transparent and properly understood by the user.

But other alignment methodologies are usually not framed using the idea of "categories of alignment".

Consequently, their outputs can be difficult to interpret and send misleading messages, as a range of elements are summarised into a unique alignment indicator and their effect on the final result cannot be disentangled. This is the case of most ITR metrics, for example. This is not necessarily an issue linked with the methodologies and outputs themselves, but rather how the results are presented.

As put by INFRAS, current "alignment methods are probably not (fully) reliable to identify which [...] categories an asset is active in. [...] Alignment methods are useful to reveal if companies *within the same [...]* category (near zero, path-to-zero, etc.) have plans to further improve their economic activities. This helps, for instance, to deliberately select those companies which are the most ambitious *in their respective* [category]." (INFRAS, 2022).

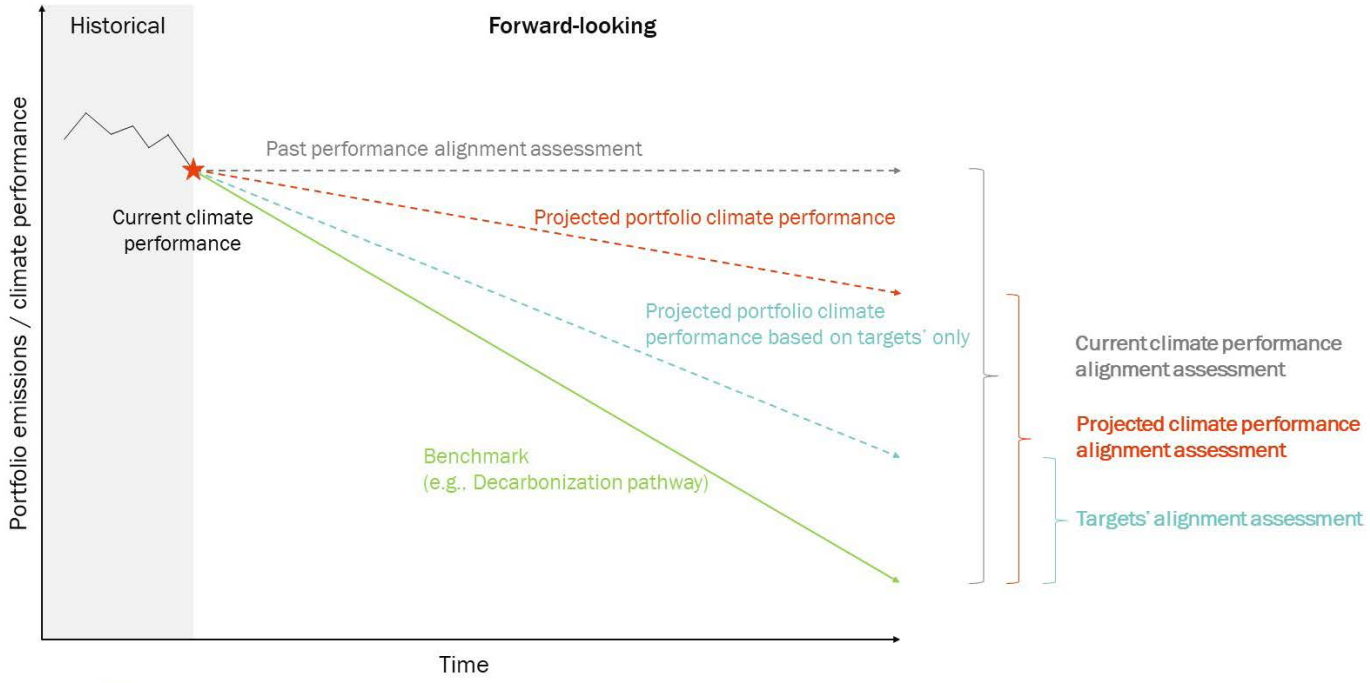
Additional work and information is usually required for the outputs of these alignment assessments to be used as data sources to evaluate one or several of the attributes necessary to classify financial assets within different categories.

Attributes that can be assessed using alignment methodologies, depending on how they are designed, include:

- Portfolio and/or financial asset *current* emissions alignment vs what they should be *in the future* in a scenario commensurate with the net zero objective ("achieved net zero");
- Past portfolio and/or financial asset performance in relation to a scenario commensurate with the net zero objective or their declared science-based targets;
- Projected portfolio and/or financial asset performance in relation to a scenario commensurate with the net zero objective, e.g. using CAPEX data and revealed plans;
- Targeted portfolio and/or financial asset performance in relation to a scenario commensurate with the net zero objective.

For example, the IIGCC conducted a detailed review of alignment methodologies and how their outputs can be used to feed into the different parts of its maturity scale framework in its "Data Vendor Catalogue" (IIGCC, 2023). Similarly, the authors' of this report have attempted to show what categories and stages of alignment each of the reviewed methodologies capture (See "Detailed review of Alignment methodologies" for more details).

Figure 27: Alignment methodologies can feed into the assessment of a range of attributes used to classify financial assets and portfolios in alignment categories and stages.



It is also useful to identify whether alignment assessment methodologies can be used to identify financial assets whose activities fall within the "climate solutions" category, contribute to lock-in emissions, or operate in sectors that will eventually need to contract, or disappear in the near to medium-run future (stranded or temporary activities). While in theory financial assets and activities can be classified within these categories using alignment assessment methodologies, this is best done through complementary methodologies such as taxonomic shares and fossil fuel exposure analysis (INFRAS, 2022).

In practice: Using financial asset-level alignment assessment methodologies to classify financial assets and activities in different alignment categories

Our review of 50+ alignment assessments methodologies distributed by private and public vendors shows the wide ranges of attributes that financial assets and portfolios need to exhibit to be attributed the best alignment rating (expressed through an ITR or other metric) (See "Detailed review of Alignment methodologies" for more details). These differences are rooted in a different understanding of what "counts" as alignment.

We attempt to map what categorie(s) and stage(s) of alignment these methodologies capture to enhance transparency on how these can be used to assess the different attribute(s) recommended by transition finance frameworks to classify financial assets and portfolios.

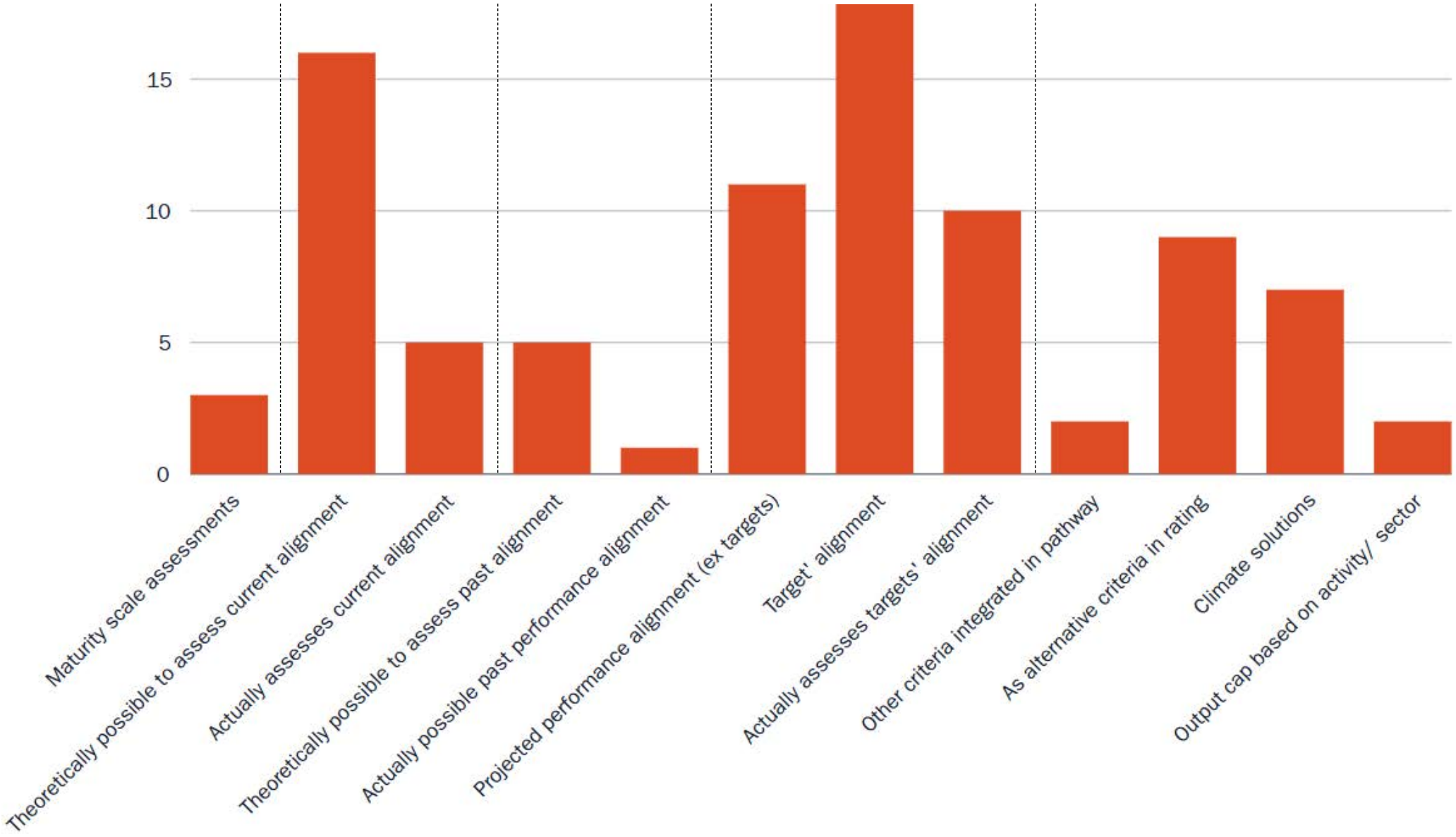
Reviewing corporate alignment assessment methodologies distributed by public and private organisations at financial asset and/or portfolio-level, we find that 3 aim to classify financial assets into alignment categories taking into account a range of criteria and a maturity scale approach. 2 of them are based on the PAII NZIF corporate maturity scale methodology.

At this stage, it is difficult to map existing alignment methodologies based on how their results could be used as **data sources to assess the specific attributes to classify financial assets into alignment categories.**

- 14 methodologies may be used, in theory, to assess a portfolio and/or financial asset *current* climate performance alignment vs what they should be *in the future* in a scenario commensurate with the net zero objective ("achieved net zero"). The data may not be segmented this way, however. Only 4 methodologies specifically focus on this dimension of alignment.
- 5 methodologies may be used to assess a portfolio and/or financial asset *past* climate performance in relation to a scenario commensurate with the net zero objective or their declared science-based targets. The data may not be segmented this way, however. Only 1 methodologies specifically focus on this dimension of alignment.

- 26 methodologies can be used to assess a portfolio and/or financial asset projected climate performance in relation to a scenario commensurate with the net zero objective or their declared science-based targets.
    - 17 methodologies use target data. 9 focus specifically on target alignment.
    - Only 2 methodology uses transition planning elements to project the future trajectory, beyond decarbonization targets.
    - Only 1 methodology uses CAPEX data and revealed plans data.
- 6 alignment assessment methodologies integrate climate solutions.
- 2 of these methodologies integrate considerations of whether the financial asset operates in sector(s) or activities that need to contract.

Figure 28: count of reviewed corporate alignment methodologies that may be used to assess different attributes



THE INGREDIENTS - DEEP-DIVE INTO KEY QUESTIONS FOR CONSOLIDATED ASSESSMENTS

Part 2 maps and classifies into high-level families target-setting and alignment assessment methodologies based on their focus.

The objective of this part is to deep-dive into how existing alignment methodologies are designed to shed light on the design choices *that are particularly relevant from a consolidated alignment perspective*.

The range of possible design choices that can be made in alignment methodologies, their convergence and divergence, were first detailed in the Alignment Cookbook (ILB, 2020) and GFANZ Portfolio Alignment Measurement workstream[47] (PAT, 2020; PAT, 2021; GFANZ, 2022)[48]. Subsequent research, including reports from INFRAS and the OECD, reviewed design choices and available methodologies, using broadly similar review frameworks (INFRAS, 2022; OECD, 2022).

Notably, the above research corpus focuses on alignment assessment methodologies. These design choices are also applicable, by extension, to alignment target-setting.

All the design choices identified in prior research and their implications are not reviewed in this report – the interested reader can refer to above-cited reports. This part focuses specifically on how certain of these design choices may, in theory, be important when building a *consolidated* alignment assessment methodology.

The identified "systemically-important" design choices are reviewed, along with their usage in existing target-setting and alignment assessment methodologies. Additionally, an examination is conducted to determine whether best practice recommendations are emerging.

Why is it important?

Alignment methodologies can be seen as a balancing exercise that attempts to reconcile scenarios, pathways and micro-level economic players' climate performance data availability with the fairness and the precautionary principles to produce results that are actionable and respect environmental integrity.

The Alignment Cookbook showed the large variability in results at portfolio- and company-level when applying different alignment assessment methodologies. Later, other research such as INFRAS (2022) and OECD (2022) reached the same conclusions, on larger samples of portfolios and companies.

Given that existing alignment assessment methodologies differ on a wide range of design choices, these reports were not able to identify with certainty the source(s) of the discrepancies, let alone test for the sensitivity of the results to different design choices, everything else being equal. In addition, it is unclear whether the differences in outputs introduced by diverging design choices attenuate or become larger when consolidating the results at higher levels.

The INFRAS (2022) report introduces the concept of systematic and unsystematic design choices: "from a statistical point of view, the relative importance of systematic biases originating from certain method choices becomes larger with higher aggregation levels, due to the larger sample size. At the same time, the effect of the inherent variability between investee companies and unsystematic biases of method choices diminishes".

Building on their definition, the concept of "systemically-important design choices" is introduced to designate these design choices *that are particularly relevant from a consolidated alignment perspective. Relevance is defined across two axis:*

- **Design choices that lead to large variations in the results at all levels, and increase the higher the aggregation level (i.e. systematic choices).**
- **Design choices that matter from a scientific robustness perspective, that work at the micro-level but run the risk of "losing carbon" in translation when consolidating.**

Framing design choices along these lines allow 1. to inform the ongoing work on convergence (PAT, 2020; PAT, 2021; GFANZ, 2022) and 2. identify key attention points when devising a *consolidated* alignment assessment.

47 Previously the TCFD Portfolio Alignment Team.
48 The Alignment Cookbook classifies 13 methodological choices in 4 high-level steps, while the GFANZ Portfolio Alignment workstream finds 9 key judgments across 3 high-level steps.

3.1 SUMMARY OF SYSTEMICALLY-IMPORTANT DESIGN CHOICES

All the design choices are important as they can create different sets of (mis)appropriate incentives at the micro-level (INFRAS, 2022). At the aggregate-level, these can raise additional questions.

In this part, we focus on three systemically-important choices:

- **Taking into consideration the perimeter and coverage, in terms of financial activities, asset classes, sectors within these activities and proportion of financial assets within these asset classes and/or sectors, parts of the portfolio's assets value chain (Scope 1, 2 and/or 3) and types of GHGs.**

While a lower coverage can, at the micro-level, be useful for using the results to drive targeted action and (attempt) to maximise data quality, at the macro-level it may create blind spots, that if not appropriately managed, may lead the users of the results to reach misleading conclusions and take unadapted actions on the basis of partial information.

As put by INFRAS, "financial institutions might be incentivised to keep providing finance to badly-aligned sectors through asset classes or financial products that are not covered by the respective alignment method to improve their apparent overall alignment" (INFRAS, 2022).

Where this is the case, a consolidated alignment assessment methodology may reward financial assets, portfolios and by extension groups of financial institutions that perform relatively well on a perimeter that is not as relevant to the transition.

- **Building and using alignment benchmarks, in particular choosing the underlying scenario(s) and pathway(s) and allocating the global, sector and/or geographic pathways to the different micro-level economic players and portfolios.**

These hypotheses differ across, and sometimes within, alignment methodologies, meaning that in practice, alignment methodologies may share out different global decarbonization burden (=choice of scenario) based on different principles (=choice of allocation approach).

A direct consequence is that even if all economic players and portfolios are assessed 1.5 °C or set 1.5 °C targets using alignment methodologies that are built using different scenarios and allocation hypothesis, everything else being equal, it remains uncertain whether they are collectively on track to 1.5 °C and that their aggregate remaining carbon budget is respected. Carbon may be "lost in translation".

Where this is the case, an alignment assessment methodology may reward financial assets, portfolios and by extension groups of financial institutions that overshoot their consolidated budget.

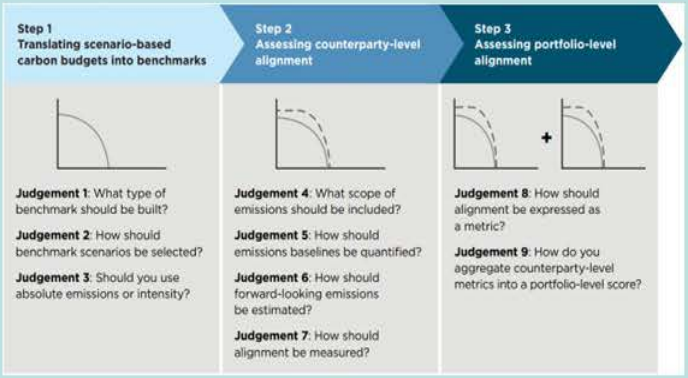
- **Aggregating, in particular choosing the level of aggregation at which to set targets and assess alignment, as well as the aggregation approach.**

The topic of aggregation is, by definition, transversal. Aggregation raises significant questions, such as how to maximise robustness from a scientific perspective and make sure the aggregated metric is meaningful and fit to drive appropriate action.

Most portfolio alignment methodologies, either used for target-setting or alignment assessment, rely on an aggregation step from financial asset-level to portfolio-level data. A range of aggregation approaches exist, each with pros and cons in terms of applicability and robustness, in particular relating to the above two systemically-important themes, avoiding blind spots and respecting the macro budget.

If no appropriate checks are in place, an alignment assessment methodology can reward financial institutions and by extension groups of financial institutions that are shifting their financial flows from the most relevant to least relevant activities, asset classes and/or sectors from a transition perspective, increasing the risk of "paper decarbonization". In addition, the aggregation approach may not maintain the link between the consolidated output and the physical reality of the remaining carbon budget.

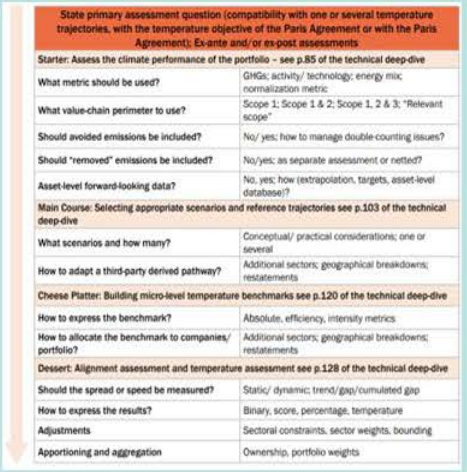
Figure 29: Part 3 summary



GFANZ Portfolio Alignment Workstream design choices

Systemically-important design choices:

- May lead to variations in output at all levels, increasing the higher the aggregating level.
- Are essential to maintain the link between the physical reality of the remaining carbon budget at the consolidated level.



State primary assessment question (compatibility with one or several temperature trajectories, with the temperature objective of the Paris Agreement or with the Paris Agreement): Ex-ante and/or ex-post assessments	
Starter: Assess the climate performance of the portfolio – see p.85 of the technical deep-dive	
What metric should be used?	GHGs; activity/ technology; energy mix; normalization metric
What value-chain perimeter to use?	Scope 1; Scope 1 & 2; Scope 1, 2 & 3; "Relevant scope"
Should avoided emissions be included?	No/ yes; how to manage double-counting issues?
Should "removed" emissions be included?	No/yes; as separate assessment or netted?
Asset-level forward-looking data?	No, yes; how (extrapolation, targets, asset-level database)?
Main Course: Selecting appropriate scenarios and reference trajectories see p.103 of the technical deep-dive	
What scenarios and how many?	Conceptual/ practical considerations; one or several
How to adapt a third-party derived pathway?	Additional sectors; geographical breakdowns; restatements
Cheese Platter: Building micro-level temperature benchmarks see p.120 of the technical deep-dive	
How to express the benchmark?	Absolute, efficiency, intensity metrics
How to allocate the benchmark to companies/ portfolio?	Additional sectors; geographical breakdowns; restatements
Dessert: Alignment assessment and temperature assessment see p.128 of the technical deep-dive	
Should the spread or speed be measured?	Static/ dynamic; trend/gap/cumulated gap
How to express the results?	Binary, score, percentage, temperature
Adjustments	Sectoral constraints, sector weights, bounding
Apportioning and aggregation	Ownership, portfolio weights

Alignment Cookbook (2020) methodological choices

Choice of perimeter and blind spots

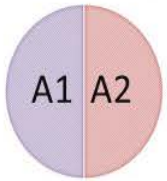
- Asset classes & activities
- GHGs included
- Investees' value chain scope

Choice of the aggregation approach

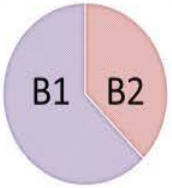
Risks: "Loosing carbon in translation" and "paper decarbonization"

Overshooting the global macro budget

Design choice 1



Design choice 2



A-B (1/2) = budget attributed to two companies under two allocation method

3.2 SETTING THE PERIMETER AND COVERAGE

Portfolio targets can be set, and alignment assessed, over different perimeters. Alignment methodologies may cover a range of financial activities, asset classes and/or sectors within these activities and proportion of financial assets within these asset classes and/or sectors. Further, alignment methodologies can cover varying parts of the portfolio's assets value chain (Scope 1, 2 and/or 3) and different types of greenhouse gases beyond carbon.

Questions related to the scope of target-setting and alignment assessments are extensively discussed in the literature on alignment. **Trade-offs emerge between aiming for the broadest possible scope, particularly concerning activities, asset classes, sectors, and financial assets crucial for the energy and climate transition over which financial institutions have influence, and considerations of data availability, method quality, and data quality.**

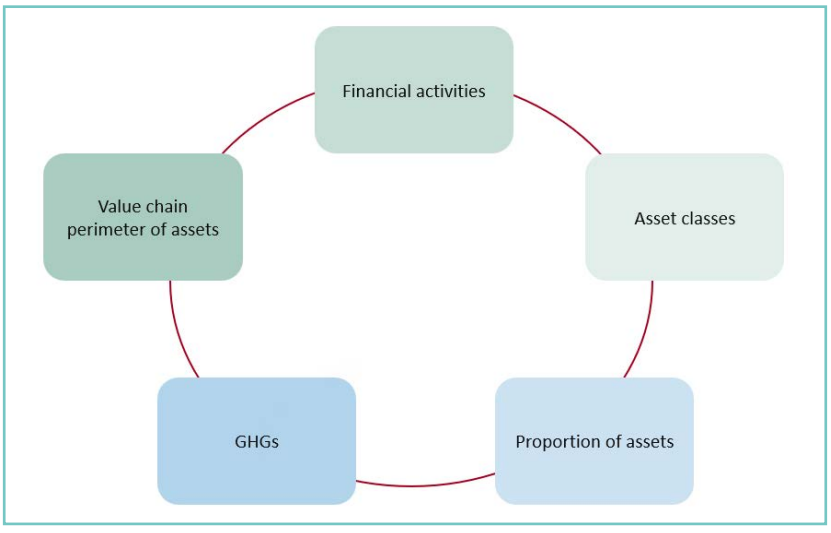
Why choices relating to the perimeter and coverage are systemically-important?

The Alignment Cookbook discussed **"system myopia"** in the context of alignment assessments. This can be extended to all alignment methodologies, including target-setting (ILB, 2020).

- Assessing alignment and/or setting targets over a certain perimeter relies on the assumption that everyone else (portfolio/companies/parts of the economy not captured by the model e.g. citizens) do their part as well, or rely on specific modelling assumptions on the behaviours of the rest of the economy.
- For example, assigning a 1.5°C temperature to a portfolio assumes that, for the whole economy to be 1.5°C-aligned, other actors also behave appropriately in the face of the needed transition to limit temperature rise under a certain level. The logic is similar when assessing the alignment of a financial asset or portfolio considering a restrained perimeter in terms of GHGs and parts of the value chain (asset's scope 1, 2 and/or 3).

The proportion of financial activities, asset classes, sectors and/or financial assets not covered by target-setting and alignment assessments can therefore be considered a blind spot, together with GHGs and value chain scopes excluded. If not appropriately managed, these blind spots may lead the users of the results to reach misleading conclusions and take unadapted actions on the basis of partial information.

Figure 30: Potential perimeter blind spots in alignment methodologies



3.2.1 Setting the financial activity, asset class and sector coverage

Targets can be set and alignment assessed over different perimeters of financial activities (e.g. investing, lending, insuring), asset classes and/or sectors within these activities and proportion of financial assets within these asset classes/sectors.

Alignment frameworks usually recommend incorporating the widest range of financial activities and asset classes possible within targets. Yet, these frameworks also recognize that methodologies are not readily available for all types of financial activities and asset classes, and that financial institutions may have varying degrees of influence through different financial activities.

Both methods availability and financial institutions' possibility to influence financial assets and activities' emissions can be considered in choosing the boundary of alignment methodologies.

As widely documented in the literature, data and methodologies' availability (and quality) varies. This is a rapidly evolving field that needs to be monitored regularly to incorporate advances in methodology development and data disclosure as they arise. Financial activities and asset classes covered within the PCAF standards are often referenced for coverage recommendations (PCAF).

The SBTi discusses the range of influence drivers financial institutions can have through their activities within the context of setting target boundaries: "Financial institutions do not typically control the activity/exposure underpinning a financial asset. Therefore, the influence principle delineates a set of driver categories which describe an FI's ability to act as gatekeepers of capital/financial services and influence other actors to reduce their GHG emission (SBTi, 2023)."

SBTi identifies two primary drivers of influence (SBTi, 2023):

- Direct influence where the financial institution has control through its legal position, e.g., as a shareholder with voting and/or control rights over a company or a financial asset.
- Indirect influence where the financial institution has other means of influence, such as: Engagement (e.g., promoting a corporate emissions reduction strategy to the management), Pricing (e.g., differentiated pricing depending on a financial asset/activity's emissions profile), Covenants (e.g., incorporate GHG emissions targets into loan agreements).

In parallel, certain macroeconomic sectors and activities are more relevant to the transition than others, either because they can support other sectors' and activities' transition or because they need to themselves transition given how emissions-intensive they currently are. Targets can be set and alignment assessed for specific sectors, and/or across multiple sectors.

Finally, data may not be readily available to integrate all financial assets within target-setting and alignment assessments. For example, emissions' disclosure is still patchy for certain types of financial assets (e.g. real estate, infrastructure projects, SMEs, developing regions) – meaning that these financial assets must either be excluded from alignment methodologies or that their emissions need to be estimated. Using estimates may allow increased coverage to decrease blind spots, but need to be carefully designed.

Review of third-party recommendations and methodologies

Target-setting methodologies - Net Zero target-setting guidance/protocols/standards

Target-setting guidance/protocols/standards **recommend or require setting targets over a range of different financial activities and asset classes, with varying levels of prescriptiveness**.

Table 9: Requirements/recommendations of selected target-setting guidance/protocols/standards regarding coverage.

NZAM commitment	
Activities coverage	See the referenced protocols: NZAOA, PAII NZIF and SBTi
Asset classes coverage	See the referenced protocols: NZAOA, PAII NZIF and SBTi
Assets/Emissions coverage	No requirement: an interim target for the proportion of assets to be managed in line with the attainment of net zero emissions by 2050 or sooner is required, and needs to be reviewed at least every five years, with a view to ratcheting up the proportion of AUM covered until 100% of assets are included.
NZAOA Target-setting Protocol (v4)	
Activities coverage	Investing, Lending, managing
Asset classes coverage	Listed equities, publicly traded corporate bonds, infrastructure, private loans to listed companies where appropriate, private equity and real estate asset classes, private debt funds, private equity funds, real estate debt funds and sovereign debt (assessment only).

Assets/Emissions coverage	• Suggests sequencing principles (e.g. direct investments before funds; higher-emitting asset-classes and sectors first...); • Requires phase-in for new/existing investments to have targets in place according to a specific calendar; • Requires sector-targets to cover the sectors described in the Protocol — including O&G, Utilities, including Coal, Transportation Steel, and so forth. • If members are unable to set targets on all required sectors, they shall fully explain their constraints (e.g., data availability or no exposure to the sector) and shall ensure that at least 70 percent of their total owned emissions are covered by 2025.
NZBA Guidelines for Climate Target Settings for Banks (2024)	
Activities coverage	Investing, Lending, Transacting (capital markets)
Asset classes coverage	No list or guidance on specific asset classes. Banks are expected to include all material asset classes (where data, methodologies and other regulatory and commercial considerations allow) and should be clear about which parts of the balance sheet the targets encompass. Banks may set separate targets for different asset classes. On-balance sheet investment activities can exclude exposures to Sovereigns, Supranationals and Multilateral Development Banks. Capital markets arranging and underwriting activities refer to the actions of bookrunners in the issuance of new debt and equity instruments for both public and private companies, and syndicated loans.
Assets/Emissions coverage	Significant majority of a bank's scope 3 emissions required, including those from a set list of nine carbon-intensive sectors. The definition of "significant majority" is not specified: Banks shall explain their approach to determining a significant majority. Target coverage is expected to increase over time as methodologies, data quality and client reporting improves.
PAII Net Zero Investment Framework (NZIF 2.0)	
Activities coverage	Investing, managing, private credit (coming soon)
Asset classes coverage	Listed equity, corporate fixed income, real estate, sovereign, infrastructure, private equity, cash and private credit (coming soon)
Assets/emissions coverage	• Investing: All assets in scope. No percentage specified. • It is recommended that asset managers work with clients to secure the appropriate mandate. • It is assumed that for asset owners all of each asset class is likely to be included, at least over the long term.
SBTi Net Zero Standard for Financial Institutions (FINZ)	
Activities coverage	Investing, Lending, Managing, Insuring (TBD, may be a separate policy paper), Transacting
Asset classes coverage	• A final list of the in-scope financial activities has not been defined for this draft. • The SBTi expects to include all currently "required" and "optional" asset classes, as established in the Near-term Framework, within the scope of the FINZ Portfolio Target Boundary. • More activities/assets will be added as accounting frameworks and methods develop.

Assets/emissions coverage	• The long-term target shall include all in-scope activities and asset classes. FIs shall disclose contextual information necessary to understand how the Portfolio Target Boundary has been established, including the share of financial activities included in the PTB relative to all financial activities in the organisational boundary and the financial metric used to quantify this share e.g., AUM, on-balance assets, loan value, etc. • The near-term target should include In Scope relevant activities and asset classes, including mandatory asset classes given climate relevance (all financial activities relating to power generation and fossil fuels, commercial real estate lending, directly-held real estate, new financial flows supporting high emitting assets (TBD)) AND the relevance of the underlying asset/sector to the portfolio. The establishment of the PTB in FINZ allows FIs to prioritise portfolio emissions reduction efforts according to climate relevance as opposed to simply targeting In Scope activities irrespective of emission levels within the FI's portfolio.
SBTi Updated Draft Near-Term Criteria and Recommendations for FIs Version 2.0 (FINT)	
Activities coverage	Investing, lending
Asset classes coverage	Real estate, Mortgages, Electricity generation project finance, Corporate and consumer loans, bonds, and equity
Assets/emissions coverage	• FIs shall set targets on all "Required Activities" in the Required Activities and Methods Table (Table 1) following the minimum boundary coverage requirement. • Percentage coverage within each asset class is provided. • FIs must cover at least 67% of its required and optional asset classes with targets (in addition to the coverage requirements outlined in Table 1). • FIs shall disclose the percentage of their total investment and lending activities covered by portfolio targets on the SBTi website, in a metric representative of the magnitude of FIs' main business activities, which may involve any combination of lending, own investments, and asset management (on behalf of third parties). • Examples include total financed emissions associated with investment and lending activities (if quantified), or any combination of total balance sheet assets, total investments, total lending book, and total assets under management, as relevant.

Target-setters need to make a decision regarding the use of estimated emissions data to increase target's coverage within the chosen perimeter.

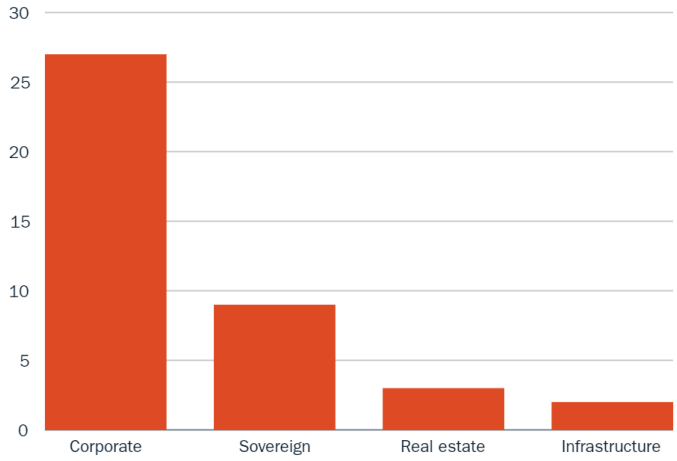
- Portfolio emissions targets can rely on the use of estimated data to increase coverage.All target-setting guidance/protocols/standards accept, at least implicitly, their use, where information is provided on the estimation technique used as well as the share of reported vs estimated data.
- Portfolio alignment targets, in the form currently recommended by target-setting guidance, protocols and standards[49], can necessitate estimated data when aggregating financial asset-level alignment assessment results at portfolio-level, depending on the aggregation methodology chosen.

Alignment assessment methodologies

- **Most alignment assessment methodologies cover corporate asset classes** for investing activities, mainly listed equity and corporate bonds, as well as for lending. **The second most covered asset class is sovereign bonds**, followed by real estate and infrastructure. Alignment methodologies that operate at financial asset-level (e.g. corporates) may be used, in theory, to assess alignment for other financial activities that are directed towards the same entity, such as underwriting or insuring.
- **Most alignment methodologies cover all macro-economic sectors** – sometimes using different design approaches depending on the sector. Most often, carbon-intensive sectors with homogeneous production units are treated using different design choices than heterogeneous sectors and sectors that are less important to the transition.
- **Most vendors use estimated data to increase coverage.** Where this is not the case, alignment is assessed over a restrained perimeter, with information provided on coverage.

49 SBTi portfolio coverage, SBTi temperature and IIGCC asset-level targets based on alignment maturity scales

Figure 31: count of methodologies reviewed per asset class



3.2.2 Selecting the scope of investees value chain and GHGs

Financial asset-level climate performance can cover operational (scope 1 & 2), upstream and/or downstream (scope 3) activities. The relative importance of operational and value chain emissions depending on the type of financial asset and sectors is widely documented, together with issues relating to data availability and quality especially for scope 3 data, certain types of financial assets (e.g. SMEs) and certain geographies (e.g. emerging countries).

The inclusion of asset-level scope 3 is one of the most widely discussed choices in frameworks. Most frameworks agree that Scope 1, 2 and "material" scope 3 should be included. Alignment frameworks vary regarding the level of details given on how to define "material" and which scope 3 categories should be included depending on the sector under consideration.

For example, the GFANZ Portfolio Alignment Measurement workstream[50] recommends considering both the relative contribution of Scope 3 emissions to total emissions and the absolute magnitude of scope 3 emissions in shortlisting "material" sectors. It identifies five sectors and associated scope 3 categories that should be included in alignment assessments, and recommends that the other sectors and categories that fulfil the two above criteria be included as well (GFANZ, 2022).

Different estimation techniques exist depending on the type of data. An automatic alignment rating may be attributed to non-disclosure of GHG emissions or other predetermined data points. Climate performance, such as emissions footprint, can be estimated using different techniques that vary widely in terms of sophistication and reliability. Several research reports detail estimation methods, their pros and cons, such as PCAF, the TCFD (TCFD, 2021), the Carbon Compass (Kepler-IIGCC, 2015).

When including value chain emissions, double counting may arise – meaning that the same emissions are counted twice (or more) when aggregating at portfolio-level, for example as one assets' scope 1 and another scope 3 emissions. In the context of alignment methodologies, double-counting may not be so much of an issue because of their comparative nature, as long as the climate performance and benchmark(s) scope are the same. The Alignment Cookbook discusses this further (ILB, 2020).

Another key design choice relates to focussing on carbon only or other relevant GHGs. Other GHGs may be particularly important for certain sectors, such as methane for oil & gas and agriculture assets. Pathways often focus on all seven IPCC GHGs, except for the IEA scenario which include methane and nitrous oxide only for the energy sectors. A related design choice pertains to whether targets should be set and alignment assessed in the aggregate or separately, to allow for more accurate measurements and decision-making[51].

All alignment frameworks recommend integrating all GHGs, with a specific focus on carbon and methane where relevant. Most frameworks recommend setting separate targets for non-carbon GHGs. For example, the Race to Zero Leadership practices mention the need to reduce methane emissions by 34% by 2030 according to the IPCC (Race to Zero, 2022).

50 Previously the TCFD Portfolio Alignment Team.

51 Aggregation of various GHG in a single "CO_2-equivalent metric" lies on Global Warming Potential (GWP) parameters that (i) bear significant uncertainty following IPCC reports (see AR6 WG I IPCC report, box 7.3) and (ii) are meaningful at a given time-horizon only (100 years by convention).

Review of third-party recommendations and methodologies

Target-setting methodologies - Net Zero target-setting guidance/protocols/standards

All target-setting guidance/protocols/standards recommend setting portfolio emissions targets that include financial asset-level scope 3 emissions – but ultimately leaves the choice to the user "where possible".

- The NZAOA mentions that Alliance members should track and report scope 3 emissions, and are encouraged to include Scope 3 in targets (2024).
- The PAII NZIF and NZBA suggest a phase-in-schedule for Scope 3 emissions (PAII, 2021/2024; NZBA, 2024).
- Targets set using the SBTi sectoral decarbonization approach apply to the relevant scope, determined at sector-level.

Recommendations/requirements on portfolio alignment targets usually incorporate considerations relating to Scope 3 emissions. Notably, the way they are built allow for greater flexibility in incorporating Scope 3 emissions considerations while taking into account low data quality.

- For example, to be considered "aligned" or "aligning", companies operating in "material sectors" should disclose their scope 3 emissions in the PAII NZIF maturity scale. Therefore Scope 3 emissions are indirectly considered through disclosure (PAII, 2021/2024).
- Targets set using the SBTi portfolio coverage approach indirectly incorporate Scope 3 considerations. Indeed, these targets relate to increasing the share of financial assets within a portfolio with validated SBTi. In order to have a validated SBTi, financial assets with Scope 3 emissions representing over 40% of total emissions should set Scope 3 targets.

Table 10: Recommendations/requirements in selected target-setting guidance/protocols/standards regarding the inclusion of assets' scope 3 emissions in portfolio emission reduction targets.

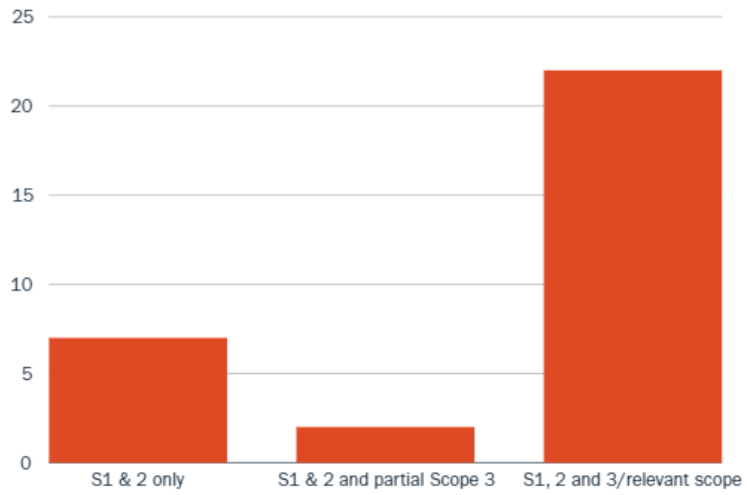
	Asset-level value chain scopes' to be included
NZAOA (Sub) portfolio target setting (2024)	Real estate assets: scope 1 & 2; embodied carbon encouraged. Scope 1 & 2 based on operational control for directly held real estate. Infrastructure private assets: Targets shall be on annual scope 1 and 2 emissions, and should include scope 3 emissions wherever possible.= All other asset classes: scope 1 & 2; Alliance members should track portfolio company scope 3 emissions but are not yet expected to set targets until interpretation of these emissions in a portfolio context becomes clearer and data becomes more reliable.
NZAOA (Sub) sector-level target setting (2024)	Alliance members should track and report scope 3 emissions, and are encouraged to include Scope 3 in targets.
NZBA decarbonization targets (portfolio-wide and sector) (2024)	Banks' targets shall include their clients' scope 1, scope 2 and scope 3 emissions, where significant, and where data allows. Scope 3 emissions for the oil, gas, and mining sectors are expected to be included. From 2026, scope 3 emissions should be included for all sectors where targets are set, where significant and where data allows.
PAII NZIF Portfolio-level target (2021/2024)	Scope 1 and 2 emissions, with scope 3 emissions phased in as data availability, quality, and consistency allow.
SBTi SDA	Targets on portfolio companies' scope 1 and 2 emissions are required for real estate and electricity generation related activities as defined by SDA methods (if relevant). For other Required Activities, FIs shall set targets on emissions scopes as required by the relevant SBTi sector-specific guidance.

Finally, all target-setting guidance/protocols/standards recommend setting targets on all GHGs, or best available.

Alignment assessment methodologies

Most alignment assessment methodologies reviewed include scope 1, 2, and 3, or relevant scope per sector. We did not deep-dive into the definition of relevant scope within each of these methodologies as part of this review but they are likely to converge towards the definition used by the SBTi.

Figure 32: count of methodologies (excl. sovereign) that include asset-level scopes 1, 2 and 3



3.3 BUILDING AND USING BENCHMARKS IN ALIGNMENT METHODOLOGIES

All alignment methodologies are built on a common foundation: share out amongst sub-state entities the global efforts required to reach the net zero state at planetary level.

To do so, alignment methodologies all rely, at least in one of their construction steps, in selecting a scenario and associated pathway(s), and translating it into one or several benchmarks at the required level of analysis (e.g. portfolio or financial asset-level).

Alignment benchmarks are derived from pathways, themselves sourced from scenarios. Scenarios and pathways are built at the macro-level: they usually share the remaining carbon budget across time, and in certain cases geographies and sectors. These pathways need to be downscaled at the level of a financial asset and/or portfolio, so that they can be used as benchmarks in alignment methodologies. This work is usually not done by the scenario builder but rather by each alignment assessment methodology developer, which can lead to some technical discrepancies for several methodologies referring to a single scenario/pathway.

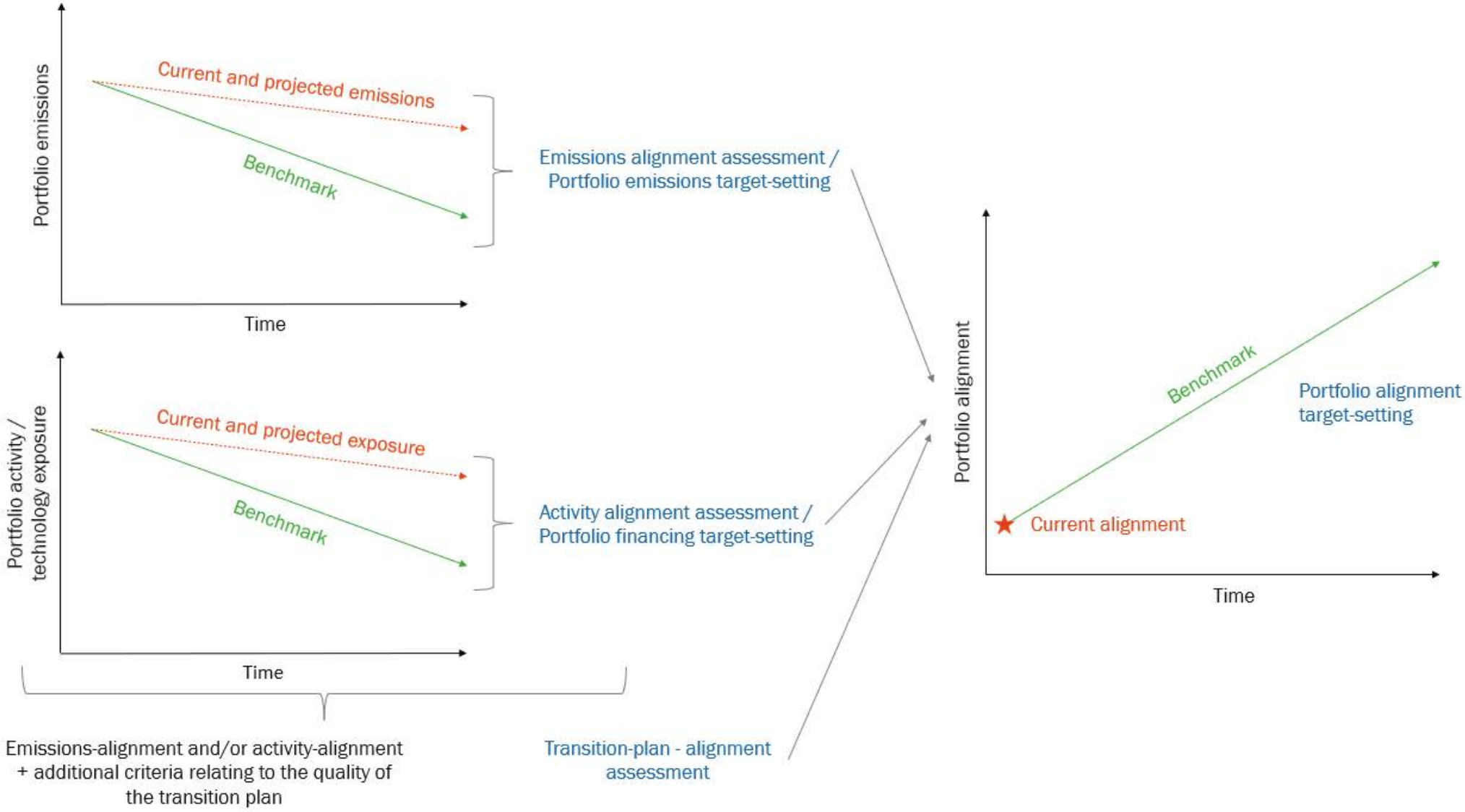
Pathways and derived alignment benchmarks are used differently in alignment methodologies.

- **Portfolio emissions target-setting methodologies**: Well-below 2°C or 1.5°C benchmarks are used to set targets under the assumption that the emissions associated with financial flows must evolve through time in line with the benchmark. Pathways "show the pace and timing of GHG emissions reductions needed to meet the level of ambition" (GFANZ, 2022).
- **Alignment assessment methodologies:** Benchmarks are used to mathematically assess the distance of portfolios and/or financial assets' past, current and projected climate performance with the chosen benchmark(s). Transition-plan alignment assessments are built by combining several criteria, including scenario-based criteria.
- **Portfolio alignment target-setting:**
    - A number of portfolio alignment target-setting methodologies rely on alignment assessment methodologies to classify financial assets or portfolios based on a range of attributes. These alignment assessment methodologies use, at least in part, benchmarks to mathematically assess the distance between the past, current and/or projected climate performance of the financial asset and determine its alignment (see above).
    - No pathways exist on the required rate of increase of "net zero" or "aligned financial assets" for the world to reach net zero in 2050, let alone a consensual definition for "aligned financial assets" (see part x). Alignment-based target-setting methodologies usually assume that all financial assets need to reach net zero emissions by 2050 or slightly before[52] – a fundamental characteristic of 1.5°C pathways – and use different methods to derive an "aligned financial asset growth rate".

We review the detailed design questions relating to how benchmarks are derived.

52 Which could be seen as more or less under-conservative considering an itself debatable causality model where financing flows need several years to translate in actual GHG emission reductions.

Figure 33: Use of benchmarks in alignment methodologies (stylised view)



Why choices relating to building and using alignment benchmarks are systemically-important?

Deriving benchmarks relies on 1. Selecting a scenario and associated pathways that themselves are built by scenario developers using a remaining carbon budget and downscaling assumptions to different sectors, regions and time, and 2. Making hypotheses on the allocation of the global, sector and/or geographic pathways to the different micro-level economic players and portfolios.

These hypotheses differ across alignment methodologies, meaning that in practice, alignment methodologies may share out different global decarbonization burden (=choice of scenario) based on different principles (=choice of allocation approach).

Therefore, alignment benchmark construction can be seen as a balancing exercise that attempts to reconcile scenarios, pathways and micro-level economic players' climate performance data availability with the fairness and the precautionary principles.

A direct consequence is that even if all economic players and portfolios are assessed 1.5°C or set 1.5°C targets using alignment methodologies that are built using different scenarios and allocation hypothesis, it remains uncertain whether they are collectively on track to limit global warming to 1.5°C. In order to limit this risk, we need to better understand which parameters in alignment (or target-setting) methodologies have the greatest influence on the variability of the alignment scores (particularly the ITRs). This is the purpose of the sensitivity analysis that has been carried out on the basis of this initial qualitative comparison of methodologies.

3.3.1 Using scenarios

Alignment methodologies can rely on a *range of scenarios and pathways*. Scenario selection is one of the most widely discussed design choices.

As highlighted in the Alignment Cookbook (ILB, 2020), **scenarios and associated pathways differ in terms of the associated temperature outcome at macro-level, probability level, and the world view embedded in them through the choice of parameters and hypothesis**. Therefore, two 1.5°C pathways from two different scenarios may be different in terms of the sectoral and time allocation of the remaining global carbon budget and embedded mitigation levers, and consequently assume different shapes. When using specific scenario(s), alignment methodologies implicitly abide by these assumptions and users need to ensure that they agree with the worldview embedded in the selected scenario(s).

- From a conceptual perspective, there is a wide consensus on the use of precautionary well below 2°C or 1.5°C scenarios. "Precautionary" is described by a set of characteristics such as temperature outcomes (1.5°C), probability levels (at least 50% chance), and the possibility of global warming to temporarily overshoot its desired level (no or low overshoot).
- Yet, as described in the Alignment Cookbook, a balance needs to be stricken between "ideal" scenarios from a conceptual and practical perspective. Indeed, several "ideal" scenarios from a conceptual perspective do not yield pathways at the right level of granularity and/or coverage in terms of sector- and geography-, or range of temperature outcomes, thereby requiring the use of pathways from multiple scenarios. GFANZ and OECD work on pathways provides a detailed framework for users to understand and compare pathways from both a conceptual and practical perspective (GFANZ, 2022; OECD, 2023).

Emissions target-setting often rely on a unique benchmark corresponding to a single temperature normative outcome (e.g. 1.5°C) to derive a specific target. Multiple benchmarks corresponding to single temperature outcomes (e.g. 1.5°C) have been used by some target-setting guidance/protocols/standards to recommend a range – within which financial institutions can set their own targets.

Alignment assessments can rely on 1. A unique benchmark corresponding to a single desired temperature outcome (e.g. 1.5°C) or 2. Multiple benchmarks corresponding to different temperature outcomes (e.g. 1.5°C, well below 2°C and 3°C). Where possible, multiple pathways corresponding to different temperature outcomes can be extracted from a unique scenario to ensure internal consistency.

In some instances, several scenarios can be combined within alignment methodologies to:

- Derive a given temperature pathway for different sectors (e.g. Scenario A for utilities and scenario B for autos, 1.5°C), where a single scenario does not offer the right level of sector and/or geography desegregation.

- Derive different temperature outcomes for the same sector (e.g. Scenario A for auto sector 1.5°C and 3°C), where a single scenario does not offer multiple internally-consistent pathways corresponding to different temperature levels.
- Derive a combination of the above, where a single scenario does not offer the right level of sector and/or geography desegregation nor multiple internally-consistent pathways corresponding to different temperature levels.

The benchmarks used in target-setting or alignment assessments can be derived using global pathways and/or sector-country specific pathways. This is true for multi-sector portfolio-level, portfolio-level sector- or technology-, and financial asset-level benchmarks.

- *Multi-sector portfolio-level benchmarks* can be derived by using global pathways or by building a portfolio-level custom pathway taking into account its sectoral and/or geographic allocation.
- *Portfolio-level sector- or technology-level benchmarks* are derived using sectoral, and sometimes geographical pathways.
- *Financial asset-level benchmarks* are built either using sector-specific (and sometimes geographic) pathways or global pathways. The choice is usually driven by the sector in which the financial asset operates and data availability.

Using more granular pathways allows one to take into account the differentiated capacities and challenges that each sector and/or geography face when transitioning. As such, it may be considered "fairer" by users, for example to assess the alignment of financial assets operating in hard-to-abate sectors or financial institutions with higher exposures to specific sectors and/or geographies.

Frameworks usually agree that pathways as granular as possible should be used where feasible. The GFANZ Portfolio Alignment Measurement workstream recommends using sector- and geography- specific pathways, as for example "the use of regionally granular scenarios can more meaningfully measure the delayed peaking of emissions in emerging markets and thus help to yield more appropriate alignment results for companies operating in emerging market regions" (GFANZ, 2022).

Review of third-party recommendations and methodologies

Target-setting methodologies - Net Zero target-setting guidance/protocols/standards

- **Most target-setting guidance/protocols/standards are not prescriptive regarding the specific scenarios to be used by financial institutions to set their portfolio emissions targets.** Most of them focus instead on a set of characteristics that the scenarios chosen need to exhibit, including temperature outcome, probability levels and how precautionary the scenario can be seen. They often list examples of acceptable scenarios.
- The NZAOA provides a decarbonization range within which financial institutions' targets must fall. The range is derived from the IPCC SR1.5 report and relies on several assumptions. Members are free to use the scenario of their choice, as long as they exhibit the desired characteristics and that the calculated decarbonization rate falls within the given range (NZAOA, 2024).
- **Little discussion is found on whether multiple scenarios may, or not, be combined by financial institutions to set portfolio emissions targets.**

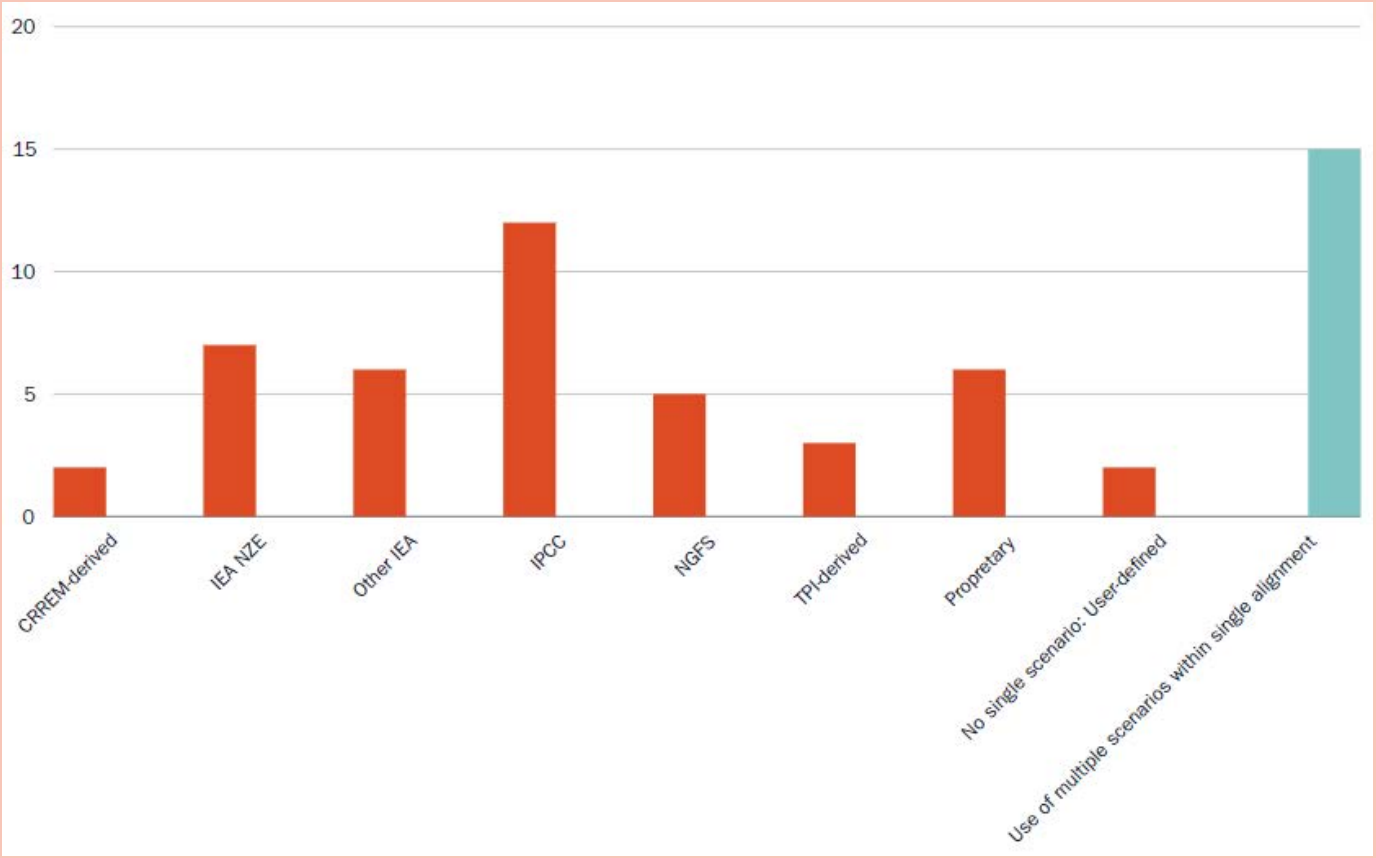
Table 11: Required/recommended scenarios and level of granularity in selected target-setting guidance/protocols/standards

	Acceptable/required/used scenarios names and/or characteristics?	Level of granularity
NZAOA (Sub) portfolio target setting (2024)	Real estate assets: Recommends the CRREM Global Pathways; other pathways might be used if they fall within the IPCC's no or limited overshoot 1.5°C global range of -40% to -60% for 2020–2030. All other asset classes: IPCC SR1.5°C no or limited overshoot pathways (2025 target); IPCC 6th assessment report (avril 2022), net CO_2 pathways (as a proxy for GHGs) with no or limited overshoot from 25/75 interquantile range (more conservative) (2030 target). The SR1.5 and AR6 provide ranges of 22–32% for 2020–2025 and -40% to -60% for 2020–2030 respectively.	Real estate assets: Sector, building type & geography-specific if possible, sector-specific and geography-agnostic Infrastructure private assets: Sector-specific & geography-specific if possible, if not sector-specific, if not global All other asset classes: Global
NZAOA (Sub) sector-level target setting (2024)	One Earth Climate Model (Teske et al. 2020), IEA NZE 2050. Other scenarios possible if they fall within the 22-32% /40-60% decarbonisation range.	Sector-specific encouraged
NZBA decarbonization targets (portfolio-wide and sector) (2024)	"Aligned with a 1.5°C by end of century outcome and shall come from credible and well-recognised sources". Banks should provide a rationale for the scenario(s) chosen. No rate is provided but rather the characteristics of scenario: banks shall only select no or limited overshoot scenarios with a >50% probability of limiting global warming to 1.5°C by the end of the century (i.e. scenarios C1 of the IPCC AR6 or equivalent). IPCC scenarios and scenarios derived from IPCC-qualifying models that meet the criteria outlined below are strongly recommended. Scenarios such as the IEA scenarios (available at the time of target setting e.g., NZE2050 scenarios), scenarios developed by regulators or sector-specific scenarios may be used, if the individual scenarios are expected to be aligned with a net-zero by 2050 goal. Banks may use different scenarios for different parts of the portfolio and/or for regional considerations, though they shall ensure that each scenario is aligned with a scenario as defined in these Guidelines.	Sector-specific encouraged
PAII NZIF Portfolio-level target (2024)	Economic, emissions, and technology pathways that result in a high probability of achieving the 1.5°C goal. As pathways are developed, at minimum: 50% probability, global net zero emissions by 2050 or sooner, region and sector-specific emissions peak as soon as possible, limited reliance on negative emissions technologies. Recommends the IPCC 1.5°C Special Report illustrated pathways, the IEA's Net Zero by 2050 roadmap and the One Earth Climate Model. Does not specify a range of decarbonization within which the target must fall.	As granular as possible recommended, where relevant
SBTi SDA	Portfolio SDA targets must meet minimum ambition indicated by sector-specific methods for 1.5°C pathways. When a 1.5°C pathway for a sector is not available, a well-below 2°C pathway may be used instead. No range is provided.	Sector-specific & geography-agnostic. Can be geography-specific if more conservative than global average (except for corporations).

Alignment assessment methodologies

- Most alignment assessments rely on scenarios developed by the same entity. **The most common scenarios are the IEA ETP, IEA NZE 2050, IPCC RCPs and NGFS[53].** Most method developers perform additional calculations on the pathways taken from the chosen scenario(s). Several method developers have developed their own scenarios and pathways.
- **When relying on several scenarios, the most common scenario combination within a single alignment assessment methodology is IEA ETP or NZE 2050 and IPCC RCP scenarios.** Several vendors also combine IEA scenarios to cover a wider range of sectors (e.g. ETP and NZE2050). Notably, RCPs are themselves averages of scenarios developed by the scientific community.
- **The sector-geography granularity of benchmarks used vary across asset classes:**
    - All real estate alignment assessments rely on sector- and geography-specific pathways, mostly based on the Carbon Risk Real Estate Monitor (CRREM).
    - Unsurprisingly, all sovereign alignment assessments use country-specific budgets.
    - Most corporate alignment assessments use sector-specific pathways for at least a set of sectors. Few use geography-specific pathways in addition to sector-specific pathways.
    - A small number of alignment assessments use sub-sector, technology-level pathways.

Figure 34: Count of methodologies reviewed using scenarios from...



53 IEA Energy Technology Perspectives (2023), IEA Net Zero Emissions by 2050 Scenario (NZE), IPCC Representative Concentration Pathway (2014), Network for Greening the Financial System (NGFS).

3.3.2 Deriving micro-level benchmarks

Most alignment frameworks mention that non-state entities must commit to do their "fair share" of efforts, in line with the requirements of halving emissions by 2030 and reaching net zero in 2050. Yet, no recommendations are given on how the "fair share" should be derived.

First, it is possible to derive a benchmark from a single pathway (from one given scenario) or build a warming function. The latter requires combining multiple pathways taken from different scenarios and leading to different temperature outcomes into one unique benchmark that relates a given level of climate performance, or changes in climate performance, to a given temperature outcome.

As put by the GFANZ Portfolio Alignment Measurement workstream[54], "a warming-function benchmark can be visualised as a set of points, each of which represents a single scenario, where the y-coordinate represents a temperature outcome, and the x-coordinate represents the value of a specific performance metric (emissions, for example) that is most closely correlated with that given outcome over a specified time period. A line of best fit is then drawn through the collection of scenarios, providing a description of the central tendency of the relationship between the performance metric and different warming outcomes" (PAT, 2020).

When using single-scenario benchmarks, pathways can be used directly as input or can be further downscaled to micro-level benchmarks.

When downscaling further to entity-level, different approaches are used, depending on the type of sectors and variables in which the pathway is expressed. At stake is the definition of what is considered a "fair" way to share the remaining carbon budget between non-state entities.

- The approach by convergence is based on the hypothesis that the emissions intensity of entities operating in the same sector, including the financial sector, should *converge at the same level at a certain time horizon*.

The approach is usually applied to "homogeneous" sectors[55] using sector-specific decarbonization pathways expressed in emissions intensity per unit of production. This is called the Sectoral decarbonization approach, or SDA, in SBTi methodologies. The convergence principle can, and has been, applied using sector agnostic decarbonization pathways expressed in economic intensity, even though it is not one of the accepted SBTI approaches. There is a debate on whether this approach favours, or not, entities that have already done significant decarbonization efforts. Indeed, while the required decarbonization rate may be lower than what would be required under the contraction approach (because starting from a lower emissions footprint), if converted to absolute emissions their overall budget may be lower than what they would be attributed under the fair share approach.

- The approach by contraction, also called rate of reduction, is based on the hypothesis that all entities and portfolios should decarbonize *at the same rate*, as given by pathways, regardless of their past efforts and current climate performance.

The approach is usually used by deriving a global, sector-agnostic decarbonization rate applied to entities' absolute emissions. This is called the Absolute Contraction approach, or ACA in SBTi methodologies. The contraction principle can, and has been applied using sector/geography specific decarbonization rate, even though it is not one of the accepted SBTi approaches. It can, and has also been applied to emissions intensity (by production or by economic output) and technology exposure metrics expressed in percentage or absolute terms.

- The fair share approach can be seen as a combination of the two approaches above. The benchmark is designed so that the cumulative climate performance over a defined period of time is equal to the entity budget over a specific period of time.

The budget can be allocated based on the current and projected share of economic or physical output, as given by the scenario or derived making additional assumptions. Notably, this approach can also be used using technology exposure, rather than emissions data. The advantage of the fair share approach is that all companies have the same cumulative absolute budget relative to their output, but the rate at which they can "spend" it takes into account current climate performance. The choice of the output metric (physical or monetary) may introduce some bias, where luxury goods companies are advantaged due to pricing structures.

Finally, the derived benchmarks can be expressed using different units: absolute, physical intensity (per unit of production) or economic intensity. It is worth noting that even if a benchmark was derived using a specific unit, e.g. physical intensity for the SDA, it can be expressed in another metric, e.g. absolute terms, for target-setting or alignment assessment purposes.

54 Previously the TCFD Portfolio Alignment Team.
55 where a clear production unit can be identified.

- Absolute benchmarks, depending on the alignment variable chosen, are expressed in absolute units, such as emissions (tCO_2 or tCO_2e) or technology exposure (kWh of renewable energy).
- Physical intensity benchmarks express an emissions-based absolute benchmark in relation to a unit of production, such as tCO_2e per Kwh generated or tonnes of steel produced.
- Economic intensity benchmarks express absolute benchmarks in relation to an economic or financial metric, for example revenue or value-added.

Where the benchmark is derived using physical intensity convergence or economic intensity contraction as an allocation principle, the user can convert it to an absolute benchmark if required before setting a target or using it in an alignment assessment, by multiplying it with quantity or economic variables. Projections as given by the scenario, which take into account the necessary contraction of certain sectors and activities, can be used to keep internal consistency.

Proponents of intensity metrics argue that it allows for better comparability and reflects the expectation that activities will grow through time. Yet, this expectation may not be justified from an alignment perspective – indeed, certain activities need to disappear or contract over the short to long-run according to scenarios.

Therefore, achieving a decarbonization target expressed only in intensity terms or being rated "net zero" or "aligned" by an alignment assessment methodology that relies on an intensity-benchmark does not capture the activity contraction that needs to happen in certain sectors to limit temperature rise below 1.5°C. Indeed, the overall absolute emissions linked to its activities may have increased, if the activity-level increased, thereby leading to budget overshoot and invalidating the alignment rating.

Review of third-party recommendations and methodologies

Target-setting methodologies - Net Zero target-setting guidance/protocols/standards

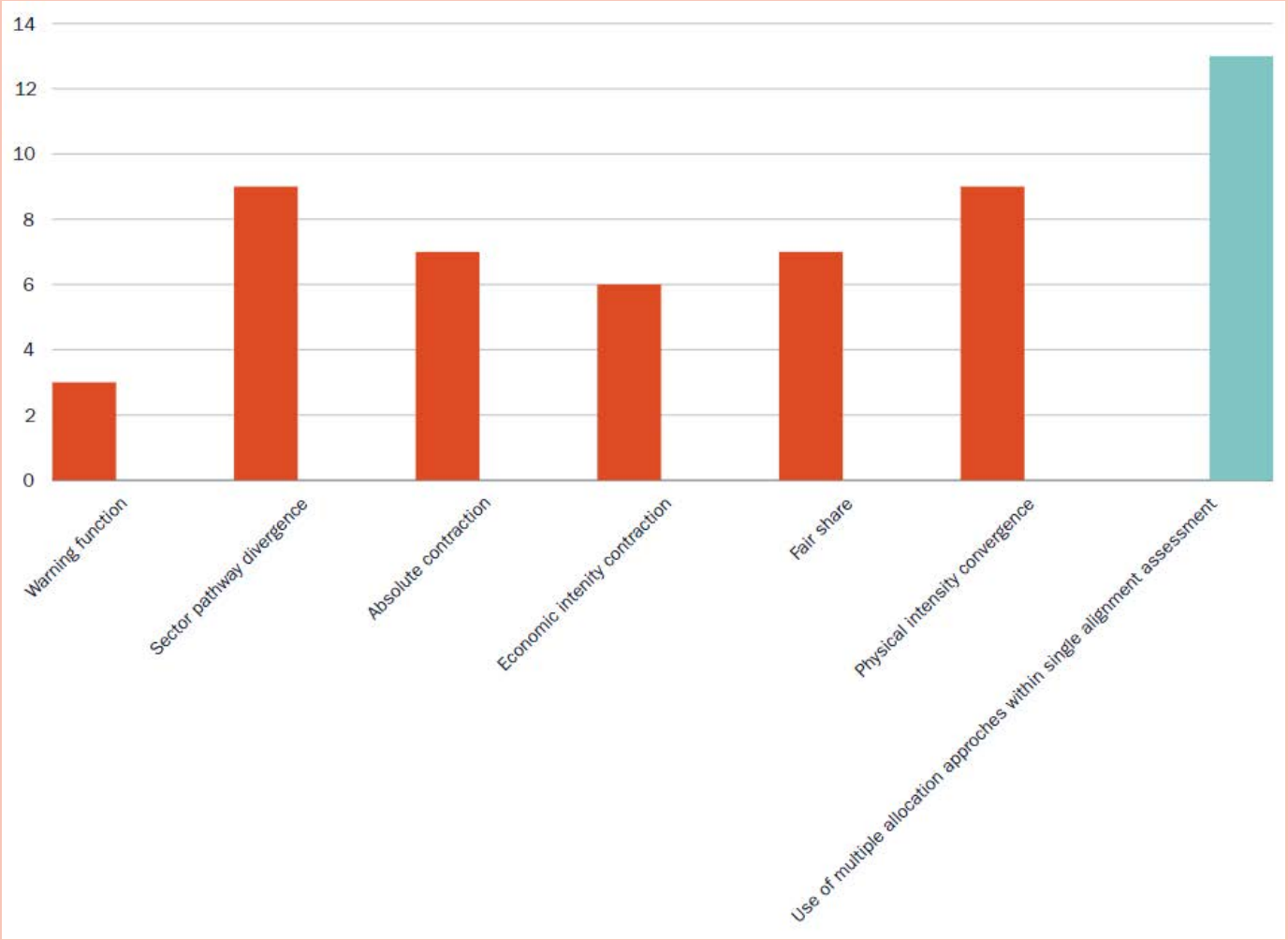
Net Zero target-setting guidance/protocols/standards are not prescriptive regarding what allocation method financial institutions should choose to set their portfolio emissions targets.

- The NZAOA does not mention any allocation method in its guidance. It provides a decarbonization range within which financial institutions' targets must fall, implicitly built on the contraction principle. Users of the protocol can set their own targets within these boundaries, based on the allocation methodology of their choice.
- The PAII NZIF also leaves the choice to the financial institution but discusses in detail the options and their implications in its Supplementary Target-setting guidance (PAII, 2021).
- The SBTi SDA, also mentioned in the NZBA target-setting guidelines, relies on the physical intensity convergence principle.

Alignment assessment methodologies

- **Most alignment assessment methodologies use "single pathways" approaches. We found only one alignment assessment methodology that uses warming functions.**
- **Most alignment assessment methodologies downscale pathways at financial asset-level.** A small number use directly sector- and/or geography-level pathways without further downscaling at financial asset-level ("sector-pathway divergence" in figure x below).
- When downscaling at financial asset-level, we find that alignment methodologies use a wide range of allocation approaches. These may vary depending on the sectors within the same methodology.
    - A small number of methodologies rely on the fair share approach. When this is the case, fair share is most often allocated using economic, rather than production, metrics, potentially benefiting companies with higher pricing structures..
    - Few methodologies use the absolute emissions contraction approach.
- Several methodologies combine different allocation approaches within their alignment assessments - usually depending on the sector and/or data availability. The most common combination is using physical intensity convergence (SDA approach) for homogeneous sectors, and/or where data is available, and absolute/economic intensity contraction for others.

Figure 35: Count of methodologies reviewed using the following allocation approaches



3.3.3 Incorporating the time dimension

Pathways and derived benchmarks distribute through time the remaining global carbon budget to limit temperature rise under a certain level under a certain probability level. Consequently when using the derived benchmarks to set a target or assess alignment, one must choose how to integrate the time dimension. There are two ways to do so.

- The point-in-time alignment approach focuses on the performance gap between a company or portfolio climate performance and its benchmarks at a specific point in time (2025 or 2030 e.g.). This approach includes targets that are set at a specific point-in-time or alignment assessments that measure the climate performance gap at a specific point-in-time, without considerations for how the company or portfolio performed before or is expected to perform after.
- The cumulative alignment approach focuses on cumulative climate performance over a defined period of time, usually expressed in absolute terms (see p.x.). This approach encompasses targets that are set on a cumulative carbon budget over a defined period of time. Similarly, alignment can be assessed over the full period, rather than at a specific point-in-time. In this approach, the misalignment of an asset or portfolio at a specific point-in-time can be compensated by "over alignment" at another point-in-time.

A related discussion concerns the frequency of update of the benchmarks used in alignment methodologies, and targets' restatement. This is particularly important for targets and alignment assessment that rely on the point-in-time approach, to avoid "overestimating" alignment.

Little discussion is found on the use of point-in-time vs cumulative targets. It often takes the form of recommendations on ex-post monitoring or re-baselining requirements. For example, the TCFD mentions that "disclosing cumulative GHG emissions over time relative to the baseline year used for an organisation's GHG emissions reduction target can help users better understand [...] the potential need to make stronger GHG emissions reductions in later years if earlier interim targets are not met" (TCFD, 2021). In the context of portfolio alignment assessments, the GFANZ Portfolio Alignment Measurement workstream[56] recommends using cumulative alignment assessments, as it better captures the relationship between the accumulation of GHGs in the atmosphere and global warming (GFANZ, 2022).

Notably, all target-setting protocols mention the need to set short-term targets in priority, to avoid delaying action, and recommend that targets are revised/reset regularly, e.g every five years. Amongst other things, this allows financial institutions to incorporate updated scenario data, which account for the potential global emissions overshoot that occurred within the prior target-setting period. An undiscussed issue which may become more important through time is how to tackle scenario updates for financial institutions that met their target.

Review of third-party recommendations and methodologies

Target-setting methodologies - Net Zero target-setting guidance/protocols/standards

Few target-setting guidance/protocols/standards recommend using either cumulative or point-in-time emissions when designing emissions targets – yet it is applicable to target-setting methodologies as well. For example, the PAII Supplementary Target-Setting guidance mentions both options, detailing the pros and cons and providing a worked example of emissions- target-setting based on cumulative emissions (PAII, 2021).

Alignment assessment methodologies

- Alignment assessment methodologies either use point-in-time or cumulative approaches.

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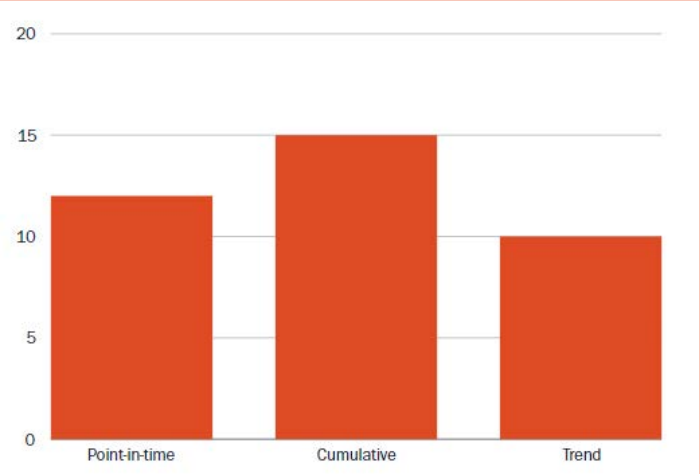
Figure 36: Count of methodologies reviewed using the point-in-time, cumulative or trend approaches.



3.4 AGGREGATING AT PORTFOLIO-LEVEL

Aggregation raises significant questions, such as how to maximise robustness from a scientific perspective and ensure that the aggregated metric is meaningful.

Most portfolio alignment methodologies, either used for target-setting or alignment assessment, rely on an aggregation methodology from financial asset- to portfolio-level data.

- **Portfolio emissions target methodologies** most often rely on:
    1. Aggregating financial asset-level emissions data at portfolio-level.
    2. Setting the rate and ambition of the target either by aggregating individual financial asset-level benchmarks or directly using sectoral, geographical and/or global pathways taken from scenarios.
- **Portfolio-level alignment methodologies (assessment and target-setting)** are based on either:
    1. Aggregating financial asset-level climate performance data and assessing alignment directly at the portfolio-level, or;
    2. Aggregating the results of financial asset-level alignment assessments at portfolio-level using a range of weighting approaches.

Portfolio-level usually designates a single asset class (e.g. listed equity) or single entity (e.g. listed equity and corporate bonds). Few alignment methodologies rely on aggregating data across multiple asset classes, let alone financial activities. Indeed, this may not be feasible or desirable given the large differences in emissions' magnitude, for example between corporates and sovereigns.

Why are choices relating to aggregation systemically-important?

Approaches set at a higher aggregation level allows to target the activities, asset classes and sectors that are most relevant to the financial institution or group of financial institutions under consideration.

Yet, if no appropriate checks are in place, an alignment assessment methodology can reward financial institutions and by extension groups of financial institutions that are shifting their financial flows from most relevant to least relevant activities, asset classes and/or sectors from a transition perspective, increasing the risk of "paper decarbonization".

In addition, the aggregation methodology used may over/underestimate the results at portfolio-level in relation to the "physical reality". A range of aggregation approaches exist, each with pros and cons in terms of applicability and robustness, in particular relating to the above two themes, avoiding blind spots and respecting the macro budget.

For example, as put by the GFANZ Portfolio Alignment workstream[57] (PAT, 2020; PAT, 2021; GFANZ, 2022), "a portfolio could include a high-emitting company with a small allocation to total portfolio value (e.g., 5%) but a large proportion of the portfolio's total carbon budget overshoot (e.g., 80%)." Certain aggregation approaches based on portfolio value would underestimate this.

3.4.1 Choosing the level of aggregation

Targets can be set and alignment assessed at different levels of aggregation. It is possible to identify four theoretical levels:

1. Across financial activities (e.g. investing, lending, facilitating)
2. Activity-level, across asset classes within one financial activity (e.g. listed equity, corporate bonds, sovereigns, real estate within investing)
3. (Sub) portfolio-level (asset-class, pan-sectoral)
4. (Sub) portfolio-level (sector-specific)

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Setting targets and assessing alignment at different levels of aggregation has implications in terms of what actions financial institutions can take to align their financial flows. Approaches set at a higher aggregation level allows financial institutions to target the activities, asset classes and sectors that are most relevant to them. Yet, if no appropriate checks are in place, alignment can be achieved by shifting financial flows from most relevant to least relevant activities, asset classes and/or sectors from a transition perspective, increasing the risk of "paper decarbonization".

Review of third-party recommendations and methodologies

Target-setting methodologies - Net Zero target-setting guidance/protocols/standards

- **The draft SBTi FINZ includes a question regarding whether targets should be set across financial activities and asset classes (1 and 2 above), differentiating between prescriptive and holistic approaches.** It proposes "to establish alignment targets *across* all asset classes *within the same financial activity,* and not within specific asset classes, giving financial institutions more flexibility to prioritise their actions on the parts of their portfolio that are most material"(SBTi, 2023). This corresponds to level 2 above.
- In parallel, it also requires short-term targets to be set at activity- or asset-class level for a list of mandatory climate-relevant activities, including for example power generation and fossil fuels (all financial activities), commercial real estate lending, directly-held real estate and new flows that can reasonably be expected to support the creation of high-emitting assets. Notably, the SBTi segmentation of climate-relevant activities is a mixture of asset-classes and sectors (SBTi, 2023).
- **The holistic approach combined to required activity- or asset-level targets can be seen as a middle-way to ensure that financial institutions can incorporate financial activities and asset classes that matter most to their own business models and climate impact, while ensuring that targets are set on specific high-impact activities or asset-classes regardless of a financial institutions' exposure.**
- **Other target-setting guidance/protocols/standards give the choice to the user without further discussion on how this may be done and/or the implications of one choice or another** – for example, the NZAOA TSP and PAII NZIF users can choose to set sub-portfolio emissions targets *aggregated across all the asset classes in scope* (except for sovereign for double-counting reasons) or disaggregated at asset-class level. None of the target-setting protocols detail what aggregation approach can be chosen to set a target across financial activities or asset-classes (NZAOA, 2024; PAII, 2021/2024).
- **Several target-setting guidance/protocols/standards recommend, in complement or standalone, setting sector-level targets.**

Table 12: Required/recommended aggregation level of targets in selected target-setting guidance/ protocols/ standards. Focus on emissions-based targets and financial flow alignment targets, excl. financing targets.

NZAOA Target-setting Protocol V4	
Overall aggregation-level of targets required/recommended	• Can set emissions-based targets at (sub) portfolio-level and/or sector-level. • Target set at (sub) portfolio-level can be set at asset-class level and/or aggregated across asset classes in scope (except sovereign because of double counting).
NZBA Guidelines for Climate Target Setting for Banks (2024)	
Overall aggregation-level of targets required/recommended	• May set separate targets for different asset classes. • Absolute emissions; and/or Sector-specific emissions intensity (e.g., CO2e/ metric).
PAII Net Zero Investment Framework (NZIF 2.0)	
Overall aggregation-level of targets required/recommended	• Emissions targets at portfolio-level can be aggregated across asset classes or disaggregated. It is recommended that targets relating to sovereigns are set and monitored separately. • Asset-class specific targets.

SBTi updated Draft Near Term Criteria and Recommendations V2.0 (FINT)	
Overall aggregation-level of targets required/recommended	• Asset-class level
SBTi Net Zero Standard for Financial Institutions (FINZ)	
Overall aggregation-level of targets required/recommended	• Portfolio-wide targets aggregated across activity/asset classes. No recommendations on how to aggregate. In consultation, 2 options: across activities or within each activity. • Asset-class/Sector-level for those asset classes/sectors that are a) one of the mandatory components outlined and b) needed to meet the overall emissions coverage goals established.

Alignment assessment methodologies

- **All alignment assessments operate at asset-class level (levels 3).** While several vendors have developed consistent alignment assessment methodologies across multiple asset classes, only two suggest an aggregation methodology across multiple asset classes (level 2), beyond corporate bonds and listed equities.

3.4.2 Aggregating alignment data

Aggregation methodologies can be differentiated based on the type of data being aggregated: climate performance or alignment data.

- **Portfolio emissions target methodologies** rely on:
  - Aggregating financial *asset-level emissions* data at portfolio-level.
  - Setting the rate and ambition of the target either by aggregating individual financial asset-level benchmarks or directly using sectoral, geographical and/or global pathways taken from scenarios.
- **Portfolio alignment methodologies (assessments and target-setting)** are based on either aggregating financial *asset-level climate performance data* and assessing alignment directly at the portfolio-level, or aggregating the financial *asset-level alignment results* at portfolio-level using a range of weighting approaches.

Aggregating *climate performance data* from financial asset to portfolio-level is widely documented in the context of portfolio emissions accounting, and may be based on responsibility or exposure. PCAF focuses on the "responsibility" approach, which allocates the financial assets to portfolio's based on an ownership indicator, and includes so far methodologies for Listed equity and corporates bonds, Business loans and unlisted equity, Project finance, Commercial real estate, Mortgages, Motor vehicle loans, Sovereign debt, Insurance (PCAF).

When assessing portfolio alignment, one of the options relies on aggregating financial asset-level climate performance data first, such as emissions, then assessing alignment directly at portfolio-level. This approach is called the "aggregated portfolio approach" in the GFANZ Portfolio Alignment workstream[58] work (PAT, 2020; PAT, 2021; GFANZ, 2022). While this approach is seen as more scientifically robust, it is complicated to implement where emissions data is missing.

Another option is to assess alignment at financial asset-level, then aggregate the alignment metric at portfolio-level. Alignment metrics can be binary (presence of a validated science-based target or not), based on a maturity scale, benchmark divergence, score or expressed using an implied Temperature rise score (see p.x).

This option is detailed in GFANZ and CDP, where different weighting approaches are detailed, including but not limited to simple portfolio weights or a combination of portfolio weights and contribution to portfolio's emissions (PAT, 2020; PAT, 2021; GFANZ, 2022; CDP, 2020). One key question is how to derive weights that capture the relative importance of asset classes to the transition and maintain the consistency of portfolio-level results with the physical reality of pathways and remaining carbon budget.

58 Previously the TCFD Portfolio Alignment Team.

Aggregating across asset classes may not be feasible or desirable without further research and methodological development. Aside from concerns about double counting, it raises questions about the relevance of such a measure. For instance, sovereign emissions are orders of magnitude larger than corporate emissions and conceptually encompass them as ultimately most of the corporate's emissions occur on the territory of a given state. Small changes could consequently have more significant impacts on portfolio emissions.

Similarly, it is unclear how to aggregate climate performance and alignment data across financial activities, in particular activities relating to financing (investing and lending) and facilitating (insuring, underwriting). Doing so would also require taking into account the different level of influence financial institutions can have through different activities.

Review of third-party recommendations and methodologies

Target-setting methodologies - Net Zero target-setting guidance/protocols/standards

Most of the target-setting protocols reviewed are not prescriptive regarding which aggregation method to use when deriving portfolio-level emissions and alignment, on which to set targets. Still, the prevailing logic appears to be that of "responsibility", as detailed in PCAF.

Regarding portfolio emissions targets, most target-setting protocols recommend assessing portfolio emissions by attributing the share of emissions which corresponds to financing flows and shares. Where the choice is left to the financial institution, transparency is recommended/required.

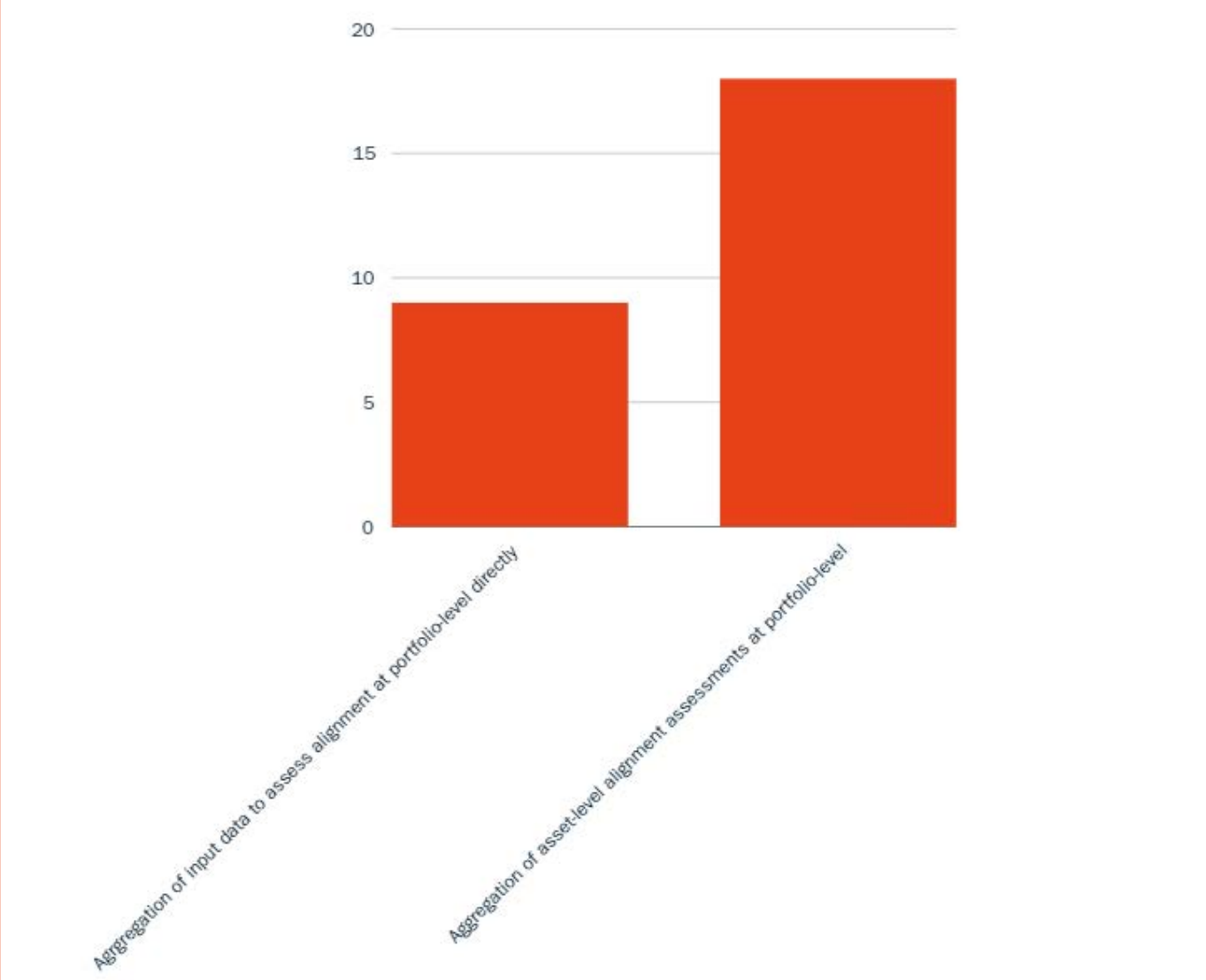
Concerning portfolio alignment targets, all target-setting protocols require assessing alignment at financial asset-level before aggregating the results at portfolio-level in their current versions.

- The PAII NZIF does not provide details as to how financial asset-level alignment assessment results should be weighed at portfolio-level.
- The SBTi lists a number of possible weighting approaches, together with an order of preference (SBTi, 2023). The preferred option is to weight financial asset-level alignment results using total emissions, thereby encouraging financial institutions to focus on financial assets that have the largest absolute emissions, regardless of their exposure. The second and third preferred options are to weight financial asset-level alignment results using financed emissions, thereby following the "responsibility" approach.

Alignment assessment methodologies

Around 2/3rds of the reviewed methodologies that produce results at portfolio-level rely on first assessing alignment at financial asset-level, then weighting them at portfolio-level, rather than aggregating climate performance data (such as emissions) before assessing alignment at portfolio-level directly. A number of methodology developers offer both options to the user. The weighting approaches used are varied, and most methodology developers offer different options to leave the choice to the user. Either way, most methodologies rely on the "responsibility" principle.

Figure 37: Count of methodologies reviewed per aggregation approach.



DETAILED REVIEW OF ALIGNMENT METHODOLOGIES

Since the publication of the Alignment Cookbook in 2020, we observe the following trends:

- The multiplication of alignment assessment methodologies at portfolio- and financial asset-level, developed both by private and public organisations.
- The diversification of alignment assessment methodologies - with the emergence of multi-criteria alignment assessments at financial asset-, portfolio and FI-level, comprising both a qualitative evaluation of FI net zero approach and quantitative alignment performance assessment.
- Rising convergence on certain design choices following the work of the GFANZ Portfolio Alignment workstream[59] - both in new methodologies and existing methodologies being reworked/relaunched.
- An increased knowledge and common vocabulary on design choices when interacting with organisations.
- An increased interdependence between methodologies, many of which use elements from other methodologies as building blocks.
- An integration of alignment assessment methodologies into wider data offerings relating to climate and the transition.

Challenges remain:

- We still observe a lack of clarity on what alignment means and what "counts" as alignment within alignment methodologies.
- While methodologies are being developed on a range of asset classes, gaps remain. Corporate asset classes are still by far the most covered.
- There is little convergence on scenario use and financial asset-to-portfolio aggregation methods.
- Assessing financed and facilitated emissions alignment remains a challenge from the external user point of view with no access to detailed data.

Notably, an increasing number of financial institutions are building their own approach internally, often using external datasets distributed by private and public organisations as data sources.

This part deep-dives into the methodologies reviewed as part of this report.

59 Previously the TCFD Portfolio Alignment Team.

FI-level Transition Plan alignment assessment:

Assess a financial institution's progress along its alignment journey, its global approach to net zero and the quality of its transition plan as a whole, including the presence and adequacy of net zero targets and the strategic and organisational means put in place to achieve them.

ACT Finance

Banking & Investing

ACT Finance is a progress assessment framework (methodologies and tool) for financial institutions. It provides a score for the financial institution analysed, sub-divided in specific modules such as target setting (both GHG and non-GHG targets), climate portfolio performance (through mainly the assessment of low carbon/transition share of portfolio, with a dedicated evaluation of the framework identification assessment used by the FI itself), business model or management, allowing to spot strengths and areas of improvements for a financial institution along its transition journey.

Use case & interpretation	
Primary objective	Transition plan alignment assessment
Level	Financial institution
Connection with other methods developed by the same organisation	Two methodologies: **ACT Finance | Banking & ACT Finance | Investing**. Has also methodologies for corporates; generic and per sector: ACT Chemicals, ACT Auto, etc. (See ACT Corporates methodology review in this appendix). Also, one methodology tackling adaptation issues, and one methodology helping companies to design a transition plan (ACT Step-by-Step).
Output metric(s)	Performance score as a number from 0 (lowest) to 20 (highest): measures the degree of alignment with the requirements of a low-carbon economy. Score sub-divided by modules and then by indicators; Narrative score as a letter from E (lowest) to A (highest): summarises the full conclusions of the analysis, including performance score results and narrative indicators, tackling issues that could not be covered by the performance indicator (e.g. controversies); Trend score as either "+" for improving, "-" for worsening, or "=" for stable: aims to forecast changes in the company's alignment with the low-carbon transition by answering the following question: "will the company's ACT score improve, worsen or stay the same if repeated in the near future?".
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	Module 1* - Targets (5 indicators) Module 3 - Intangible investments (1 indicator) Module 4 - Portfolio climate performance (2 indicators) Module 5 - Management (6 indicators) Module 7 - Investees engagement (3 indicators) Module 8 - Policy engagement (4 indicators) Module 9 - Business model (1 indicator)

	Weighting at indicator-level (specific weighting depending on the banks-type, Commercial and Retail banks, or FI-type, asset manager and asset owner).
Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data is used in: • Module 1 (indicator 1 - Alignment of Scope 3.15 Emissions Reduction Target): To derive a decarbonization benchmark for the sector/asset class/portfolio target under consideration and assess its (mis)alignment (= "commitment gap"); • Module 1 (indicator 5 - Climate Solutions Financing target): Rates Climate Financing Target based on a matrix that includes scenario-based elements, in particular whether the climate solutions investment roadmap/framework shows compatibility with 1.5°C trajectory, established by science, under one of the scenarios quoted by the methodology (see below).
Scenario(s) and pathway(s) used	• Module 1 (Indicator 1 & 2): Based on NZE 2050 (v2021) scenarios where available and well below 2°C on the other one (e.g. Pulp & Paper (IEA ETP 2020), Glass (IEA ETP 2020)). • Module 1 (indicator 5): Scenarios referenced: o IEA's Net Zero by 2050 (NZE2050); o NGFS' Net Zero scenarios; o University of Technology Sydney's One Earth Climate Model; o PRI Inevitable Policy Response 1.5°C Required Policy Scenario.
Applicability	
Financial actor coverage	• ACT Finance | Banking: o Retail & Commercial banks (or Consumer banking, Saving banks); o Institutional banking (Capital Market activities (Equity & Bonds operations)). • ACT Finance | Investing: o Asset Managers (including private equity or debt investors); o Asset Owners (insurance company, pension funds, public entity).
Asset class coverage	Assess the following asset classes for each FI: • Banking: Corporate loans, Real estate (commercial & residential), a subset of Consumer lending (Mortgages and Auto loans), Project financing, Debt & Equity underwriting; • Investing: Equity (Listed and Private), Debt (Listed and Private), Real estate (REITS), Project financing.
Documentation and detailed method availability	• ACT Finance | Banking, 04/2023 • ACT Finance | Investing, 04/2023 To be updated by S1 2024 following road-test.
Availability of dataset and coverage	ACT has been running a road-testing exercise, engaging with FI to collect the necessary information, and applying the methodology. Finalization of methodology & tool adaptation following the road-test is on-going.
Methodology	
General	References and builds on multiple other tools and frameworks.

	Base the assessment of the low carbon/transition share on the FI's assessment itself, while providing more or less points depending on the quality of the identification framework set by the FI according to core expectations.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in the Cookbook.
Climate performance input data	• Uses multiple data points as input into the assessment; • Collects information through engagement with each FI; Assessment on public basis is possible but some data points may be challenging to collect, notably for modules 4 (transition share) and 7 (engagement). • Rates each module and indicator and aggregate it to produce the final FI rating.
Focus on the attributes rated using scenario data as an input	• Module 1: Requires engagement, financing climate solutions and financed emissions targets to get the maximum score. For financed emissions, requires sector-specific targets for sectors that contribute highly to global emissions and with the highest exposure in FI portfolio. Monetary sectoral targets, asset class and/or portfolio targets are taken into account but downgraded as less relevant. • Module 1, (indicator 1 – Alignment of Scope 3 Emissions Reduction Target: o Assesses decarbonization target alignment with up to date decarbonization scenario (typically IEA NZE 2050) and modulates the final rating based on target characteristics (target mix, level, scope of GHGs, coverage, data quality…); o Uses two allocation principles depending on the sector to assess target's alignment: ▪ Physical intensity convergence: aluminium, automotive, building, cement, electric utilities, glass, iron and steel, oil & gas, pulp and paper, real estate, retail, transport; ▪ Absolute emissions contraction: Agriculture & agri food, chemicals, asset class, portfolio-level; ▪ Assesses the trend alignment over the target time horizon. • Module 1 (indicator 5 - Climate Solutions Financing target): o Rates Climate Financing Target based on a matrix that includes scenario-based elements, in particular whether the climate solutions investment roadmap/framework shows compatibility with 1.5°C trajectory, established by science, under one of the scenarios quoted by the methodology. • Module 1 (indicator 4 – Engagement): o Rates if the fossil fuels phasing out & deforestation strategies are ambitious enough meaning that investing activities will not contribute to unlock projects that are not

	compatible with keeping global warming below 1.5°C (e.g. new credit lines to oil & gas production). • Module 4 - Financial flows trend: o Assesses the financial institution's contribution to financing the transition of the real economy through the perspective of its past and current investments (trend score/position score based on the assessment of a "low carbon/transition share" evolution). While it is possible to rely on fall-back "standard" approach, "eligible" assets to this low carbon/transition share needs to be identified by the Financial institution itself. The quality of the identification framework set by the FI is itself assessed and influences the output score. o The "low carbon/transition share" position and trend is assessed against an Ideal Aligned Share metric and Ideal Aligned Year metric. These metrics are based on expert-guess rather than scenario-based alignment assessment.
Additional analytical step(s)	NR
Sector/portfolio-level aggregation	Aggregates the score of each sector to get a final aggregated score. As so, if the financial institution wishes to look into the details scoring, it can understand its aligned/aligning share on each sector (or its target alignment by sector as well in module 1). If the FI has no sectoral strategy an assessment at asset class/global level is possible but will gain less points as it is deemed less relevant.
Planned updates	Post road-test methodology and tool to be issued during 2024, including the main following evolutions: • Ease of Data quality adjustment factors in module 1; • Possibility of a "taxonomical fall-back" approach for module 4 in absence of low carbon/transition share identification framework (gains less points as deemed less relevant); • Reshape of module 9 business model.

InfluenceMap

Climate Change Methodology

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial institution
Connection with other methods developed by the same organisation	Lobbying rating
Output metric(s)	Three metrics for each FI: 1. Performance bands for "organisational" indicators (0 to 100 scale); 2. Portfolio fossil fuel intensity metrics: absolute exposure (in dollars) and relative exposure (% of the total portfolio value); 3. Portfolio Paris Alignment scores (-100% to +100% with a score of 0% denoting alignment with the underlying climate scenario).
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	1. FI-level qualitative methodology: Matrix organisational performance band includes the FI Climate governance, targets & strategy; Stewardship of Real Economy Companies on Climate/Resolutions; Lobbying on Sustainable Finance Policy; 2. Portfolio-level methodology: Fossil fuel exposure for portfolio; 3. Portfolio-level methodology: **PACTA** Paris Alignment Score (See PACTA methodology review in this appendix).
Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data is used within the Portfolio Paris Alignment score calculation to derive a technology exposure benchmark for the technology/sector/portfolio under consideration and assess its (mis)alignment.
Scenario(s) and pathway(s) used	IEA NZE 2050
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	NR
What stage(s) of alignment does the output measure?	**PACTA** Paris Alignment score can be used to identified aligned performance at technology/sector/portfolio-level.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	NR
Applicability	
Financial actor coverage	Banks, Asset Manager, Asset Owner.
Asset class coverage	Assess the following asset classes for each FI: • Corporate lending, Equity underwriting, Bond underwriting, Equity investments.

Documentation and detailed method availability	• InfluenceMap - Finance and Climate Change Methodology • InfluenceMap - Finance and Climate Change Methodology, March 2022
Availability of dataset and coverage	30 largest majority investor-owned financial groups; Free dataset.
Methodology	
General	**PACTA** is used as an input (See PACTA methodology review in this appendix).
Main changes since the publication of the 2020 Alignment Cookbook	No major changes.
Climate performance input data	• FI-level qualitative methodology: FI Climate governance, targets & strategy; Stewardship of Real Economy Companies on Climate/Resolutions; Lobbying on Sustainable Finance Policy: o Collects the data on Organisational websites, External research, Financial disclosures, Media reports, Regulatory disclosures, Corporate disclosures, CDP disclosures. • Portfolio-level methodology: Fossil fuel exposure for portfolio: o Collects exposure of the stream to fossil fuel production value chains data on the basis of GICS and NAICS sector classifications. • Portfolio-level methodology: uses **PACTA** Paris Alignment Score: o Collects portfolio composition data from Bloomberg LEAG tables and Refinitiv Lipper.
Focus on the attributes rated using scenario data as an input	• Uses **PACTA** to calculate the portfolio Paris Alignment Score. o Retrieves portfolio composition using Bloomberg LEAG tables and Refinitiv Lipper; o Runs **PACTA** using the IEA NZE 2050 scenario. • Calculates three Paris Alignment Scores based on PACTA data: o The technology Paris Alignment Score is calculated based on the relative difference between the portfolio's total owned production in a technology and the portfolio's NZE target over a five-year timeframe; o The sector Paris Alignment Score is calculated based on the fraction of production each technology has within its sector in the portfolio aggregate in 5 years' time and the extent to which its production must change between 2020 and 2030 in the NZE; o The portfolio Paris Alignment Score is the weighted average of the Sector PA scores, with weightings reflecting portfolio value exposed to a given sector and the sector's importance to the emissions transition.

Additional analytical step(s)	NR
Sector/portfolio-level aggregation	NR
Focus on how financial institutions are rated within the methodology	NR
Planned updates	

Transition Pathway Initiative

Carbon performance score (banks)

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level
Connection with other methods developed by the same organisation	**TPI** also distributes a carbon management score for banks based on qualitative indicators, as well as carbon performance and management scores for companies operating in other sectors (See TPI methodology review in this appendix).
Output metric(s)	Banks' target alignment bank, at activity & sector-level: • 1.5°C, below 2°C, National Pledges, Not aligned. Other indicator/methodology: • Carbon management score that rates the bank's management quality of greenhouse gas emissions and risks/opportunities related to the low-carbon transition.
Scenario(s) and pathway(s) used	See **TPI** scenarios.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Have current financed/facilitated emissions per unit of production and/or targeted financed/facilitated emissions per unit of production in line with the sector-level decarbonization benchmarks.
What stage(s) of alignment does the output measure?	It is possible to identify in the dataset: 1. Banks that have sector/activity financed/facilitated emissions already at the required 2050 net zero level; 2. Banks that have sector/activity financed/facilitated emissions aligned targets.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	NR
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access sector-level benchmark data.
Applicability	
Asset class	NR
Documentation and detailed method availability	Net Zero Banking Assessment Framework, June 2023.
Coverage	27 banks.
Sector coverage	Activities: Mortgages, auto loans, corporate banking (project finance, corporate lending), investment banking and capital market activities (Sales & Trading, M&A advisory, debt & equity facilitating, derivatives, commodities, treasury and risk management), asset management. Sectors: 13 sectors (Airlines, Aluminium, Autos, Cement, Diversified mining, Electric utilities, Oil & Gas, Shipping and Steel, chemicals, coal mining, real estate).
Methodology	

General	Directly builds on TPI for corporates.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in the Alignment Cookbook.
Scenario input data	• Uses scenario data to derive a decarbonization benchmark for the banks' target under consideration and assess its (mis)alignment; • Builds multiple benchmarks at sector-level: o Uses TPI scenario.

Climate performance input data	• Uses GHG emissions per unit of production as embedded in bank's targets to measure climate performance:
	  o Uses disclosed data only;
	  o Includes scope 1, 2 or 3 where relevant.
	• Uses disclosed targets:
	  o When targets only apply to a certain proportion of emissions, the remainder is kept at current-level;
	  o When a portfolio does not have a target, emissions are kept constant at current levels;
	  o When a target has a shorter time horizon than the assessment, emissions are kept at target-level thereafter.

Alignment assessment	• Performs alignment assessment for each sector-level target; • Performs alignment assessment using point-in-time assessment: o compares the distance between projected emissions intensity and the sector benchmark in 2025, 2035 and 2050. • Calculates the alignment score by interpolation (i.e. using multiple pathways corresponding to different temperatures). The carbon performance score is attributed based on the benchmark to which the projected climate performance is closest.
Additional analytical steps	NR
Sector/portfolio-level aggregation	NR
Focus on how financial institutions are rated within the methodology	NR - the whole method relates to banks.
Planned updates	

Target-setting protocols for financial institutions:

Used by financial institutions to set their targets and/or third-parties to derive normative alignment benchmarks to assess financial institutions' targets.

NZAOA

Target-setting Protocol

General information	
Name of initiative	NZAOA
Host/secretariat	PRI/UNEP FI
Protocol/Guidance development	Yes
Who develops the Protocol	Members' led (Monitoring, reporting and verification track), with strategic advisory body and scientific body reviews.
Name of the Protocol + documentation	NZAOA TSP v4 (April 2024)
Other documentation specific to target-setting	Prior target-setting Protocols, Guidance on Proxy Voting, The Net in Net Zero Position paper, Thermal coal position, Oil & gas position paper.
Primary audience	Asset Owners, can be used by Asset Managers including private equity (PE).
Target validation	Yes - member-led process. The Accountability Mechanism process foresees certain escalation steps and can, in an extreme case, lead to a delisting of members.
Target certification	No
Target-setting high-level guidelines	
Activities covered by the target-setting guidance (investing, lending, managing, insuring, transacting)	Investing, Lending, managing.
Asset classes included in target-setting, as listed in the Protocol	Listed equities, publicly traded corporate bonds, infrastructure, private loans to listed companies where appropriate, private equity and real estate asset classes, private debt funds, private equity funds, real estate debt funds and sovereign debt (assessment only).
Includes on/off balance sheet assets?	• All assets under management (and on balance sheet) managed by the asset owner while exercising asset allocation in fiduciary duty (including assets managed in-house, by third parties, for shareholder, and for policyholder in cases where the asset allocation is carried out by the asset owner); • Excludes money managed by group owned asset managers on behalf of third-party clients. This is not considered asset owner money as either it is not on the balance sheet of the asset owner or (strategic) asset allocation is under the responsibility/discretion of clients/customers. This may include unit-linked, separate account asset, and mutual funds offered to third-parties, among others.
Target mix required/recommended	• Alliance members should set targets on all four parts of the target-setting approach (engagement, sector, sub portfolio & financing transition);

	• The minimum expectation is that Alliance members shall set targets on three (engagement target is mandatory, and two others).
Overall aggregation-level of targets required/recommended	• Can set emissions-based targets at (sub) portfolio-level and/or sector-level; • Target set at (sub) portfolio-level can be set at asset-class level and/or aggregated across asset classes in scope (except sovereign because of double counting).
Coverage requirements	• Suggests sequencing principles (e.g. direct investments before funds; higher-emitting asset-classes and sectors first…); • Requires phase-in for new/existing investments to have targets in place according to a specific calendar; • Requires sector-targets to cover the sectors described in the Protocol — including O&G, Utilities, including Coal, Transportation Steel, and so forth. If members are unable to set targets on all required sectors, they shall fully explain their constraints (e.g., data availability or no exposure to the sector) and shall ensure that at least 70 percent of their total owned emissions are covered by 2025.
Is an aggregation approach across asset classes and/or financial activities mentioned, recommended or required?	Does not recommend specific aggregation approaches across asset classes.
Target-setting timeline	12 months from committing.
Target base year	FY target-setting year -1 or -2 (recommended).
Requires 2025 or sooner targets?	Yes
Requires 2030 targets?	Yes
Target-time horizon	Every 5 years: 2025, 2030, 2035, etc.
Cycle for further intermediate targets	Every 5 years (Required).
Detailed target-setting methodologies (focus on portfolio emissions' reduction and alignment targets)	
Portfolio emissions' reduction target(s)	<u>NZAOA (Sub) portfolio target setting</u>: • Metrics to measure climate performance & set target: o Real Estate assets: Physical intensity metrics for real estate/annum, absolute GHG emissions/annum; o Infrastructure private assets: Absolute or physical intensity GHG emissions; lifetime emissions for greenfield assets; o All other asset classes: Absolute or economic intensity GHG emissions (CO_2e/$mn invested). • Scope: o Real estate assets: scope 1 & 2; embodied carbon encouraged. Scope 1 & 2 based on operational control for directly held real estate; o Infrastructure private assets: Targets shall be on annual scope 1 and 2 emissions, and should include scope 3 emissions wherever

	possible; o All other asset classes: scope 1 & 2; Alliance members should track portfolio company scope 3 emissions but are not yet expected to set targets until interpretation of these emissions in a portfolio context becomes clearer and data becomes more reliable. • All GHGs or best available data; • Aggregation: o (Sub)-portfolio (i.e. aggregated across asset classes): absolute emissions; o Corporations (debt and equity instruments, publicly traded infrastructure assets, private equity funds, private debt funds, private loans to listed companies, private loans to unlisted/privately held companies): weighted by EV or EVIC; carbon intensity by EV or EVIC (recommended); o Directly held real estate, real estate equity funds: sum of emissions; o Commercial real estate, real estate debt fund, mortgages: owned emissions based on the loan-to-Value ratio (outstanding loan amount divided by the value of building); o Privately held real estate: owned emissions via equity and debt. • Scenarios: o Real estate assets: Recommends the CRREM Global Pathways; other pathways used however pathways must meet the IPCC's no or limited overshoot 1.5°C global range of -40% to -60% for 2020–2030; o All other asset classes: IPCC SR1.5 no or limited overshoot pathways (2025 target); IPCC 6th assessment report (april 2022), net CO_2 pathways (as a proxy for GHGs) with no or limited overshoot from 25/75 interquantile range (more conservative) (2030 target). The SR1.5 and AR6 provide ranges of 22–32% for 2020–2025 and -40% to -60% for 2020–2030 respectively. • Granularity of pathways: o Real estate assets: Sector, building type & geography-specific if possible, sector-specific and geography-agnostic; o Infrastructure private assets: Sector-specific & geography-specific if possible, if not sector-specific, if not global; o All other asset classes: Global; o Use of OECM providing regional granularity is possible. • Allocation principle: Unclear. The recommended ranges are built based on the contraction principle, but members can set their own specific target if they fall within the range - no allocation methodology is

	recommended or mentioned. <u>NZAOA sector-level target-setting:</u> • All macroeconomic sectors, starting with most material (see above); • Metrics to measure climate performance & set target: Emissions intensity is recommended (physical intensity is recommended, economic intensity is not); absolute emissions; • Scope: scope 1 & 2; Alliance members should track and report scope 3 emissions, and are encouraged to include Scope 3 in targets; • All GHGs or best available data; • Scenarios: One Earth Climate Model (Teske et al. 2020), IEA NZE 2050; Other IPCC no/low overshoot scenarios possible if they fall within the 22-32%/40-60% range; • Allocation: Not specified; likely to be like the SDA approach.
Portfolio alignment target(s)	No

NZBA

Target-setting Guidelines

General information	
Name of initiative	NZBA
Host/secretariat	UNEP FI
Protocol/Guidance development	Yes
Who develops the Protocol	Members-led
Name of the Protocol + documentation	Guidelines for Climate Target Settings for Banks V2 (April 2024).
Other documentation specific to target-setting	• Guidelines for Climate Target Settings for Banks, supporting notes (April 2024); • Carbon Credits Supporting Note (September 2023).
Primary audience	Banks
Target validation	Yes – third-party independent assurance of performance against targets is encouraged.
Target certification	Not Required
Target-setting high-level guidelines	
Activities covered by the target-setting guidance (investing, lending, managing, insuring, transacting)	Investing, Lending, Transacting (capital markets).
Asset classes included in target-setting, as listed in the Protocol	No list or guidance on specific asset classes. Banks are expected to include all material asset classes (where data, methodologies and other regulatory and commercial considerations allow) and should be clear about which parts of the balance sheet the targets encompass. Banks may set separate targets for different asset classes. On-balance sheet investment activities can exclude exposures to Sovereigns, Supranational and Multilateral Development Banks. Capital markets arranging and underwriting activities refer to the actions of bookrunners in the issuance of new debt and equity instruments for both public and private companies, and syndicated loans.
Includes on/off balance sheet assets?	• Lending and capital market activities are required while investment activities are encouraged; • On-balance sheet investment and lending activities covered; • On-balance sheet securities held for client facilitation and market-making purposes (as opposed to held for investment) excluded.
Target mix required/recommended	• An emissions-based target (portfolio-level and/or sector-level) is required; • Other types of targets (e.g. portfolio coverage, lending, ITR) may complement the decision-making quality but are not required and are additional; • While a bank's targets may be supported by other

	approaches (e.g., production volume trajectories, technology mix) or measurements (e.g., financing targets), the targets shall nonetheless be set in absolute emissions and/or emissions intensity terms or use an alternative methodology highlighted by the Alliance.
Overall aggregation-level of targets required/recommended	May set separate targets for different asset classes. Portfolio-level and/or sector-level: • Absolute emissions; and/or; • Sector-specific emissions intensity (e.g., CO2e/ metric).
Coverage requirements	Significant majority of a bank's scope 3 emissions required, including those from a set list of nine carbon-intensive sectors. The definition of "significant majority" is not specified: Banks shall explain their approach to determining a significant majority. Target coverage is expected to increase over time as methodologies, data quality and client reporting improves.
Is an aggregation approach across asset classes and/or financial activities mentioned, recommended or required?	Not Required
Target-setting timeline	First round of targets within 18 months (including substantial majority of carbon-intensive sectors), and within 36 months for remaining carbon intensive sectors. Capital Market activities to be included in all targets from 1 November 2025 onwards.
Target base year	FY target-setting year – 2 is strongly encouraged but may, in exceptional economic circumstances, be more.
Requires 2025 or sooner targets?	No
Requires 2030 targets?	Yes
Target time horizon	Banks shall set a 2050 target; Banks shall set an interim target for 2030 or sooner and may set further interim targets prior to that date.
Cycle for further intermediate targets	Minimum every 5 years.
Detailed target-setting methodologies (focus on emissions- and alignment-based targets)	
Portfolio emissions' reduction target(s)	<u>NZBA decarbonization targets (portfolio-wide) & sector targets:</u> • Asset class applicable: Not specified; • Metric to measure climate performance & set target: Physical intensity (or, exceptionally and when justified, financial intensity); absolute emissions; • Scope: o Banks' targets shall include their clients' scope 1, scope 2 and scope 3 emissions, where significant, and where data allows; o Scope 3 emissions for the oil, gas, and mining sectors are expected to be included. From 2026, scope 3 emissions should be

	included for all sectors where targets are set, where significant and where data allows. • All GHGs, or best data available; • Aggregation: o The NZBA does not mandate a specific aggregation method, but information should be provided. • Scenario: o "Aligned with a 1.5°C by end of century outcome and shall come from credible and well-recognised sources"; o Banks should provide a rationale for the scenario(s) chosen; o No rate is provided but rather the characteristics of scenario: banks shall only select no or limited overshoot scenarios with a >50% probability of limiting global warming to 1.5°C by the end of the century (i.e. scenarios C1 of the IPCC AR6 or equivalent); o IPCC scenarios and scenarios derived from IPCC-qualifying models that meet the criteria outlined below are strongly recommended; o Scenarios such as the IEA scenarios (available at the time of target setting e.g., NZE2050 scenarios), scenarios developed by regulators or sector-specific scenarios may be used, if the individual scenarios are expected to be aligned with a net-zero by 2050 goal; o Banks may use different scenarios for different parts of the portfolio and/or for regional considerations, though they shall ensure that each scenario is aligned with a scenario as defined in these Guidelines. • Granularity of pathways: o Sector-specific encouraged; o Region-specific possible. • Allocation principle: Not specified.
Portfolio alignment target(s)	Possible but not required nor detailed. Signatories may select additional alternative methodological approaches, such as an implied temperature rise or forward-looking technological profile, as expressed in production capacity. In selecting additional metrics, signatories shall: • provide their rationale; • ensure that they meet commonly accepted methodological expectations and data requirements; and • provide an explanation of the methodology as well as references to external public sources of

	information. In selecting additional metrics for guiding their alignment, banks shall nonetheless disclose their most recent emissions (absolute emissions and emissions intensity) on an annual basis. The Alliance may produce additional sector-specific resources that highlight specific additional methodologies where there is a robust and credible rationale for incentivising optimal real-world emissions outcomes and where those methodologies are a) based on emissions data, b) transparently calculated with the formulae in the public domain, and c) match the climate ambition of the NZBA framework.

Paris-Aligned Investment Initiative

Net Zero Investment Framework

General information	
Name of initiative	PAII NZIF
Host/secretariat	IIGCC/IGCC/Ceres/AIGCC
Protocol/Guidance development	Yes
Who develops the Protocol	IIGCC/IGCC/Ceres/AIGCC
Name of the Protocol + documentation	• NZIF 2.0 March 2024; • NZIF Implementation guide V1 March 2021; • NZIF component for the private equity industry 2023; • Guidance for infrastructure assets 2023.
Other documentation specific to target-setting	NZIF: IIGCC's supplementary guidance on target-setting 2021; Net Zero Stewardship Toolkit; Investor expectations of corporate transition plans; Net zero bondholding stewardship guidance; Investing in Climate solutions: listed equity and corporate fixed income.
Primary audience	Asset Owners, Asset Managers including private equity (PE) (indirectly investment consultants).
Target validation	No (external validation recommended).
Target certification	No
Target-setting high-level guidelines	
Activities covered by the target-setting guidance (investing, lending, managing, insuring, transacting)	Investing, managing, private credit (coming soon).
Asset classes included in target-setting, as listed in the Protocol	Listed equity, corporate fixed income, real estate, sovereign, infrastructure, private equity, cash and private credit (coming soon).
Includes on/off balance sheet assets?	When applied by AM, it applies to both. Less stringent than for AO in terms of required coverage: "asset managers will need to engage with clients over time to secure mandates and adjust or design products to enable an increasing proportion of funds under management to be managed in line with net zero".
Target mix required/recommended	• Asset-level targets: Enhanced portfolio coverage target (based on the NZIF methodology which incorporates multiple criteria, compatible but different from SBTi) at asset-class level (corporates, real estate, sovereign, infrastructure, private equity); • Portfolio Decarbonization Reference Objective: Portfolio emissions targets for listed equity, corporate fixed income and real estate infrastructure can be integrated or set separately; sovereign emissions-based targets should be set separately; PE emissions-based targets are optional. The objective is to facilitate the integration of climate objectives into strategic allocation and to facilitate the monitoring and evaluation of efforts to align portfolios; • Climate solutions allocation target (optional for PE); • Engagement target.

Overall aggregation-level of targets required/recommended	• Emissions targets at portfolio-level can be aggregated across asset classes or disaggregated. It is recommended that targets relating to sovereigns are set and monitored separately; • Asset-class specific targets.
Coverage requirements	• Investing: All assets in scope. No percentage specified; • It is recommended that asset managers work with clients to secure the appropriate mandate; • It is assumed that for asset owners all of each asset class is likely to be included, at least over the long term.
Is an aggregation approach across asset classes and/or financial activities mentioned, recommended or required?	No
Target-setting timeline	NR
Target base year	Not specified
Requires 2025 or sooner targets?	No
Requires 2030 targets?	• Emissions & climate solutions - max 10-year, 5-year assessment recommended. • Portfolio coverage - 5-year target.
Target-time horizon	• Enhanced portfolio coverage (asset-class): 5-year; • Emissions reductions (portfolio): <10-year; • Allocation to climate solutions: <10-year; • Engagement target: 5-year. Immediate 70% threshold to be met, increasing to 90% by 2030.
Cycle for further intermediate targets	Minimum every 5-year.
Detailed target-setting methodologies (focus on portfolio emissions' reduction and alignment targets)	

Portfolio emissions' reduction target(s)	<u>NZIF Portfolio-level target:</u>
	• Applicable to:
	  o Listed equity, corporate fixed income, and real estate;
	  o Sovereign emissions should be considered separately for double counting reasons;
	  o Infrastructure: Optional.
	• Metrics to measure climate performance & set target: Absolute emissions or emissions intensity (CO_2e/$mn invested). EVIC favoured over WACI;
	• Scope:
	  o Scope 1 and 2 emissions, with scope 3 emissions phased in as data availability, quality, and consistency allow;
	  o Sovereigns: Production emissions (including and excluding land use, land use change, and forestry (LULUCF)) and then include consumption emissions on a best effort basis, if desired.
	• All GHGs or best available data;
	• Aggregation: Recommends financed emissions using Enterprise Value Including Cash (EVIC), WACI also possible;

	• Scenarios:
	  o Economic, emissions, and technology pathways that result in a high probability of achieving the 1.5°C goal;
	  o As pathways are developed, at minimum: 50% probability, global net zero emissions by 2050 or sooner, region and sector-specific emissions peak as soon as possible, limited reliance on negative emissions technologies;
	  o Recommends the IPCC 1.5°C Special Report illustrated pathways, the IEA's Net Zero by 2050 roadmap and the One Earth Climate Model;
	  o Does not specify a range of decarbonization within which the target must fall.
	• Granularity of pathways: As granular as possible recommended, where relevant;
	• Allocation principle: Investors can choose the approach - multiple suggestions in the target-setting supplement.

Portfolio alignment target(s)
 	
Criteria with an * directly integrate scenario-based alignment performance assessment
	<u>IIGCC asset-level enhanced portfolio coverage - corporates:</u>
	• Applicable to: corporates asset class;
	• References **CA100+** (See CA100+ methodology review in this appendix), the **Transition Pathway Initiative** (See TPI methodology review in this appendix), **SBTi** (See SBTi methodology review in this appendix); and **CTI** (see CA100+ methodology review in this appendix);
	• Metrics to measure climate performance & set target:
	  o Alignment maturity scale (achieving net zero, aligned, aligning, committed to aligning, not aligned);
	  o Criteria: High-impact companies (companies on the Climate Action 100+ focus list, companies in high impact sectors consistent with Transition Pathway Initiative sectors; banks; real estate and agriculture): Current emissions against 2050 net zero level*, Long-term ambition*, short- and medium-run targets*, emissions performance*, disclosure, decarbonization strategy, capital allocation alignment*;
	  o Other companies: Current emissions against 2050 net zero level*, short- and medium-run targets*, emissions performance, disclosure;
	  o Optional: climate policy engagement, climate governance, just transition, climate risk and accounts.
	• Weighting: Maturity scale;
	• Aggregation: Not specified - seems to be SBTi option 7 (outstanding value);
	• Allocation: 100% of assets to be i) net zero or ii) aligned to net zero, by 2040; This expectation aims to enhance the probability that 100% of assets are achieving net zero by 2050.

	• Output: Share of AUM in each alignment bucket.
	
	<u>IIGCC asset-level enhanced portfolio coverage - sovereigns:</u>
	• Applicable to:
	  o Sovereigns;
	  o Regional and municipal authorities that issue bonds may be included on a best effort basis as assessment methodologies are not widely available.
	• References the **Germanwatch CCPI** (See Germanwatch CCPI methodology review in this appendix); **ASCOR** (See methodology review in this appendix), and **CAT**.
	• Metrics to measure climate performance & set target:
	  o Alignment maturity scale (achieving net zero, aligned, aligning, committed to aligning, not aligned);
	  o Criteria: Capital / budget allocation alignment*, emissions performance*, decarbonisation plan, disclosure, targets*, ambition*.
	• Weighting: Maturity scale;
	• Aggregation: Not specified - seems to be SBTi option 7 (outstanding value);
	• Allocation: 100% of assets to be i) net zero or ii) aligned to net zero, by 2040; This expectation aims to enhance the probability that 100% of assets are achieving net zero by 2050;
	• Output: Share of AUM in each alignment bucket.
	
	<u>IIGCC asset-level enhanced portfolio coverage - real estate:</u>
	• Applicable to: Real estate (individual direct investments, investments in assets pooled through a fund structure, and investments in listed real estate companies);
	• References **CRREM** (See CRREM methodology review in this appendix);
	• Metrics to measure climate performance & set target:
	  o Alignment maturity scale (achieving net zero, aligned, aligning, not aligned);
	  o Criteria: Current emissions against 2050 net zero level*, emissions performance*, decarbonization plan, governance, disclosure, targets*, ambition*.
	• Weighting: Maturity scale;
	• Aggregation: Not specified - seems to be SBTi option 7 (outstanding value);
	• Allocation: 100% of assets to be i) net zero or ii) aligned to net zero, by 2040;
	• Output: Share of AUM in each alignment bucket.
	
	<u>IIGCC asset-level enhanced portfolio coverage - infrastructure:</u>
	• Applicable to: Infrastructure (equity and debt

	exposure held through direct or co-investments, listed and unlisted infrastructure funds, project finance or passive investments); • Metrics to measure climate performance & set target: o Alignment maturity scale (achieving net zero, aligned, aligning, committed to aligning, not aligned); o For greenfield assets, the highest status that can be achieved is "aligning"; o Operational assets: Current emissions against 2050 levels*, Ambition*, Short- and medium-term targets*, Emissions performance*, Disclosure, Decarbonisation strategy, Governance; o Greenfield assets: Ambition, Short- and medium-term targets*, Decarbonisation strategy, Governance. • Weighting: Maturity scale; • Aggregation: Not specified - seems to be SBTi option 7 (outstanding value); • Allocation: o Increase % AUM in net zero, aligned or aligning assets; 100% of assets to be i) net zero or ii) aligned to net zero, by 2040; o For new assets where the GP has significant influence, progressively aim for 100% of operational assets to be classified as "aligned" or "net zero" by 2030. • Output: Share of AUM in each alignment bucket. <u>IIGCC asset-level enhanced portfolio coverage - Private equity:</u> • Applicable to: Private equity (General and limited partners); • Metrics to measure climate performance & set target: o Alignment maturity scale (achieving net zero, aligned, aligning, committed to aligning, not aligned); o Current emissions against 2050 levels*, Ambition*, Governance, Short- and medium-term targets*, Disclosure, Emissions performance relative to targets, Climate strategy. • Weighting: Maturity scale; • Aggregation: o GPs: Invested capital and/or financed emissions; o LPs: Committed capital and/or financed emissions. • Allocation: o A % of invested capital or financed emissions to be managed in alignment with net zero by 2030 and an increased % by 2040; achieve 100% net zero by 2050; o Target thresholds at different point in time

	depends on the “influence band” in which the GPs/LPs activities sits. • Output: Share of capital in each alignment bucket.

SBTi

Net Zero Standard for Financial Institutions (FINZ)

The SBTi is developing the first science-based net-zero Standard for financial institutions. A Consultation Draft, setting out the conceptual framework and initial Criteria, was released in June 2023. An Exposure Draft, incorporating updated Criteria, Methods and Metrics, is expected to be released in early 2024 prior to the first Standard to be released at a later date (TBD).

General information	
Name of initiative	SBTi FI Net Zero (FINZ) Standard
Host/secretariat	CDP/UNGC/WRI/WWF/WMBC
Protocol/Guidance development	Yes
Who develops the Protocol	NGO led
Name of the Protocol + documentation	Consultation document (June 2023)
Other documentation specific to target-setting	Updated NEAR-TERM FINANCIAL SECTOR SCIENCE BASED TARGETS GUIDANCE v2.0; Fossil Fuel Finance position paper "Foundations for Science-Based Net-Zero Target Setting in the Financial Sector" (2022).
Primary audience	Banks, asset managers, asset owners, private equity firms, (re)insurers.
Target validation	Yes - by the SBTi
Target certification	Yes
Target-setting high-level guidelines	
Activities covered by the target-setting guidance (investing, lending, managing, insuring, transacting)	Investing, Lending, Managing, Insuring (TBD, may be a separate policy paper), Transacting.
Asset classes included in target-setting, as listed in the Protocol	A final list of the in-scope financial activities has not been defined for this draft. The SBTi expects to include all currently "required" and "optional" asset classes, as established in the Near-term Framework, within the scope of the FINZ Portfolio Target Boundary: listed equity, funds of funds, private equity, electricity project finance, Corporate loans (including short term debt and small and medium enterprises lending; corporate bonds; private debt), real estate, mortgages. More activities/assets will be added as accounting frameworks and methods develop.
Includes on/off balance sheet assets?	Yes
Target mix required/recommended	Requires both near-term and long-term targets. Near term target- setting within the Portfolio Target Boundary shall include: • Focus on portfolio-wide (financial flow) alignment target; • Target aligned with the SBTi Fossil Fuel finance policy; • Where appropriate, asset classes and sector-level targets, at least for mandatory activities/asset-

	classes and the ones that represent a "significant" share of the portfolio. Long term target shall include: • Portfolio-wide alignment target; • Portfolio-wide emissions reduction target. • Emissions neutralisation target.
Overall aggregation-level of targets required/recommended	Portfolio-wide targets aggregated across activity/asset classes. No recommendations on how to aggregate. In consultation, 2 options: across activities or within each activity. Asset-class/sector-level for those asset classes/sectors that are a) one of the mandatory components outlined and b) needed to meet the overall emissions coverage goals established.
Coverage requirements	The long-term target shall include all in-scope activities and asset classes. FIs shall disclose contextual information necessary to understanding how the Portfolio Target Boundary has been established, including the share of financial activities included in the PTB relative to all financial activities in the organizational boundary and the financial metric used to quantify this share e.g., AUM, on-balance assets, loan value, etc. The near-term target should include In Scope relevant activities and asset classes, including mandatory asset classes given climate relevance (all financial activities relating to power generation and fossil fuels, commercial real estate lending, directly-held real estate, new financial flows supporting high emitting assets (TBD)) and the relevance of the underlying asset/sector to the portfolio. The establishment of the PTB in FINZ allows FIs to prioritize portfolio emissions reduction efforts according to climate relevance as opposed to simply targeting In Scope activities irrespective of emission levels within the FI's portfolio.
Is an aggregation approach across asset classes and/or financial activities mentioned, recommended or required?	All in-scope asset classes - no recommendations on how to aggregate. In consultation, 2 options: across activities or within each activity/asset class.
Target-setting timeline	TBD
Target base year	FY target-setting year - 2 maximum ("no more").
Requires 2025 or sooner targets?	Unlikely given timing but will depend on consultation.
Requires 2030 targets?	Likely given consultation feedback but TBD - Makes sense given desire for compatibility with other organizations' timelines (IEA, GFANZ, etc.) but MRV concerns may mean need to avoid "2030 and every 5-years after" timeline due to potential audit bottlenecks.
Target-time horizon	Near-term Target Timeframe, FINZ-C12, Option B: FIs shall establish near-term targets for 2030 and at 5- year intervals after that until the long-term net-zero target year (2050 at the latest). Degree of Alignment over Time, FINZ-C15, Option B: A contraction-based approach that establishes minimum

	thresholds for key milestones based on a critical mass of climate relevant activities being 1.5°C aligned over time (e.g., XX% of portfolio emissions within the portfolio target boundary are 1.5°C aligned by 2030, YY% by 2035 etc). Fossil Fuel Transition, FINZ-C33: by 2030.
Cycle for further intermediate targets	Will depend on consultation.
Detailed target-setting methodologies (focus on portfolio emissions' reduction and alignment targets)	
Portfolio emissions' reduction target(s)	No details in the first version of the SBTI FINZ. Likely to encompass targets set using the sectoral decarbonization approach (SDA).
Portfolio alignment target(s)	No details in the first version of the SBTI FINZ. Likely to encompass Portfolio coverage and Temperature, plus other (selected) methodologies.

SBTi

Updated Draft Near-Term Criteria and Recommendations for FIs Version 2.0 (FINT)

General information	
Name of initiative	SBTi Near-Term Criteria and Recommendations for FIs (FINT).
Host/secretariat	CDP/UNGC/WRI/WWF/WMBC
Protocol/Guidance development	Yes
Who develops the Protocol	NGO led
Name of the Protocol + documentation	Updated Draft Near-Term Criteria and Recommendations for FIs Version 2.0.
Other documentation specific to target-setting	Previous versions of the SBTi FI target-setting guidance; SBTi Net Zero Standard for Financial Institutions (FINZ); Fossil Fuel Finance position paper "Foundations for Science-Based Net-Zero Target Setting in the Financial Sector" (2022).
Primary audience	Banks, asset managers, asset owners, private equity firms, (re)insurers.
Target validation	Yes – by the SBTi
Target certification	Yes
Target-setting high-level guidelines	
Activities covered by the target-setting guidance (investing, lending, managing, insuring, transacting)	Investing, lending.
Asset classes covered by the target setting, as listed by Protocol	Real estate, Mortgages, Electricity generation project finance, Corporate and consumer loans, bonds, and equity.
Includes on/off balance sheet assets (money managed for third-party clients, reinsurance…)?	If an asset manager/financial institution can make investment decisions or have been or is involved in designing the investment strategy (i.e. have had or has some influence over fund/security selection and/or can vote for the securities in its portfolio), these assets shall be included in the target boundary. Investments managed under discretionary mandates covered. Investments administered (on behalf of third parties) under advisory or execution-only mandates optional. Assets under custody or execution-only mandates are out of scope.
Target mix required/recommended (where relevant differentiate between time horizon, asset class, activity…).	• Portfolio emissions targets based on the sectoral decarbonization approach (SDA) required for real estate investment/loans, residential mortgages, electricity generation project finance. Optional for corporate asset classes; • Portfolio coverage and Temperature targets (CDP method) can be set for corporate asset classes. Financial institutions that finance companies with Forest, Land & Agriculture (FLAG) related emissions that total 20% or more of overall emissions across scopes are recommended

	to set a Portfolio Coverage target on those companies. Fossil fuel sector-specific targets.
Overall aggregation-level of targets required. Focus on emissions-based targets (SDA, financed emissions targets…) and financial flow alignment targets (portfolio coverage, both simple and enhanced)	Asset-class level
Coverage requirements (including disclosure and specific indicators required to disclose share covered)	FIs shall set targets on all "Required Activities" in the Required Activities and Methods Table (Table 1) following the minimum boundary coverage requirement. Percentage coverage within each asset class is provided. Financial institutions must cover at least 67% of its required and optional asset classes with targets (in addition to the coverage requirements outlined in Table 1). Financial institutions shall disclose the percentage of their total investment and lending activities covered by portfolio targets on the SBTi website, in a metric representative of the magnitude of financial institutions' main business activities, which may involve any combination of lending, own investments, and asset management (on behalf of third parties). Examples include total financed emissions associated with investment and lending activities (if quantified), or any combination of total balance sheet assets, total investments, total lending book, and total assets under management, as relevant.
Is an aggregation approach recommended (excl. assets to portfolio)?	Financial institutions shall disclose the percentage of their total investment and lending activities covered by portfolio targets on the SBTi website, in a metric representative of the magnitude of financial institutions' main business activities, which may involve any combination of lending, own investments, and asset management (on behalf of third parties). Examples include total financed emissions associated with investment and lending activities (if quantified), or any combination of total balance sheet assets, total investments, total lending book, and total assets under management, as relevant.
Time for target-setting after joining (detailed by targets if necessary)	24 months from committing.
Base year (detailed by targets if necessary)	No requirement - should be the same across targets.
Requires 2025 or sooner targets? (detailed by targets if necessary)	No
Requires 2030 targets? (detailed by targets if necessary)	Depends - SDA: 5 years minimum, 10 years maximum from submission PC & PC based on temperature: 5 years maximum from submission.

Target-time horizon	Portfolio SDA targets must cover a minimum of 5 years and a maximum of 10 years from the date the financial institution's target is submitted to the SBTi for an official validation. Financial institutions' Portfolio Coverage targets must be fulfilled within a maximum of five years from the date the financial institution's target is submitted to the SBTi for validation. Portfolio Temperature Rating targets must be fulfilled within a maximum of five years from the date the targets are submitted to the SBTi for an official validation.
Cycle for further intermediate targets (detailed by targets if necessary)	Recalculation every 5-year minimum.
Detailed target-setting methodologies (focus on emissions- and alignment-based targets)	
Emissions-based target-setting	<u>SBTi SDA:</u> • Applicable to: o Real estate and electricity generation–related activities (required); o Residential mortgages, corporate loans, listed and private equity and debt for sectors where methods are available (optional). • Metrics to measure climate performance & set target: Physical intensity; • Scope: o Targets on portfolio companies' scope 1 and 2 emissions are required for real estate and electricity generation related activities as defined by SDA methods (if relevant). For other Required Activities, Financial institutions shall set targets on emissions scopes as required by the relevant SBTi sector-specific guidance. • All GHGs, or best data available; • Aggregation: References PCAF; • Scenarios: o Portfolio SDA targets must meet minimum ambition indicated by sector-specific methods for 1.5°C pathways; o When a 1.5°C pathway for a sector is not available, a well-below 2°C pathway may be used instead; o No range is provided. • Granularity of pathways: o Sector-specific & geography-agnostic. Can use geography-specific if more conservative than global average (except for corporates). • Allocation principle: Physical intensity convergence to 2050.
Alignment-based targets	<u>SBTi Portfolio coverage:</u> • Applicable to: Corporate asset class; • Metrics to measure climate performance & set target: o Binary (Yes/No);

	o 1.5 °C aligned science-based targets. • Weighting: No weighting (single criteria); • Aggregation: Aggregation of asset-level alignment assessment results: weighted average by … order of preference: o Option 1: Total Assets emissions weighted temperature score (AOTS); o Option 2: Revenue owned emissions weighted temperature score (ROTS); o Option 3: EV + Cash emissions weighted temperature score (ECOTS); o Option 4: Enterprise owned emissions weighted temperature score (EOTS); o Option 5: Market owned emissions weighted temperature score (MOTS); o Option 6: Total emissions weighted temperature score (TETS); o Option 7: Weighted average temperature score (WATS). • Allocation: Linear path to 100% portfolio coverage by 2040; • Output: o % of financed emissions/financial flows to companies with a validated SBTi; o Score between 0-1 (if Yes/No converted to 1/0 before aggregation). <u>SBTi Temperature:</u> • Applicable to: Corporate asset class; • Metrics to measure climate performance & set target: o Implied Temperature Rise score; o Ambition of targets, expressed through an ITR (see CDP Temperature Rating method). • Weighting: No weighting (single criteria); • Aggregation: Aggregation of asset-level alignment assessment results: weighted average by … order of preference: o Option 1: Total Assets emissions weighted temperature score (AOTS); o Option 2: Revenue owned emissions weighted temperature score (ROTS); o Option 3: EV + Cash emissions weighted temperature score (ECOTS); o Option 4: Enterprise owned emissions weighted temperature score (EOTS); o Option 5: Market owned emissions weighted temperature score (MOTS); o Option 6: Total emissions weighted temperature score (TETS); o Option 7: Weighted average temperature score (WATS). • Allocation: o Portfolio-level S1 + 2: Linear path to 1.5 °C by 2040; o Portfolio-level S1 + 2 + 3: Linear path to well-

	below 2°C by 2040. • Output: Portfolio-level Implied Temperature Rise score.

Portfolio alignment assessment:

Build on financial asset-level data and comprise an asset to portfolio aggregation method.

Carbon4 Finance – CIARA

(Climate Impact Analytics for Real Assets Alignment assessment)

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level (end-use level); portfolio-level
Connection with other methods developed by the same organisation	Carbon4 Finance also distributes **CIA scores** for listed equity (See CIA methodology review in this appendix), corporate bonds and sovereigns. It can also apply **CRREM methodology** for real estate assets (See CRREM methodology review in this appendix).
Output metric(s)	1. Annual and cumulative tonnes of CO_2 avoided (added) versus the low-carbon pathway; 2. ITR (1.5 - 6°C); 3. Over/undershoot expressed in quantity of GHGs (absolute).
Scenario(s) and pathway(s) used	Scenario developed by Carbone 4, adapted from the IEA ETP 2DS scenario.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Have a current and projected CO_2 intensity per physical output, for each end-use, in line with sector (end-use) and geography-specific decarbonization pathways.
What stage(s) of alignment does the output measure?	Is it possible to identify in dataset: 1. Assets who already have the required 2050 net zero level; 2. Assets that will decarbonize at the right pace (because of decarbonization plans).
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets whose cumulative future emissions are below the carbon budget.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Sector-level benchmarks are available to the user.
Applicability	
Asset class	Infrastructure
Documentation & detailed method availability	• Assessing Infrastructure Portfolios' Alignment with the Paris agreement, Methodological guide, June 2020 • Website
Coverage	Paying dataset, custom
Sector coverage	• Selected sectors: Energy, Transports, Telecommunication, Waste, Water, Social; • Greenfield and brownfield assets.
Methodology	

General	General approach similar for all assets/portfolios.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Scenario input data	• Uses scenario-data to derive a decarbonization benchmark for the asset under consideration and assess its (mis)alignment; • Scenario developed by Carbone 4, adopted from the IEA ETP 2DS scenario; • Builds a 2°C benchmark for each type of end-use and assets (e.g. for electricity assets, potential end-uses include: Specific electricity; Heat for buildings; Energy for the industry).
Climate performance input data	• Collects reported data on scope 1, 2 and 3 (where relevant) CO_2 and methane emissions (waste projects); • Estimates CO_2 and methane emissions when not reported using one of two available approaches: o Approach 1: Bottom-up approach (e.g. LCA, physical asset-level approaches); o Approach 2: Financial approach, or simplified analysis, using a ratio database built by Carbone 4 for each asset type and end use. • Where available, integrates variables relative to changes in operations that occur over the life of the asset, the implementation of a mitigation action later in time, degradation of the asset output as it ages to adjust for the CO_2 and methane emissions profile of the asset through time.
Alignment assessment	• Compares life cycle CO_2 and methane emissions intensity by unit of production with what it needs to be under a 2°C scenario; • Calculates the cumulated CO_2 and methane deviation between the climate performance of the asset for each of its end-use and the relevant 2°C benchmark, over the infrastructure life cycle.
Additional analytical steps	Aggregates cumulated over/undershoot for each of the asset's end-use at asset-level, based on the share of each end-use that the asset serves (physical output).
Sector/portfolio-level aggregation	Aggregates asset-level alignment assessment results: weighted average by the absolute amount of emissions deviated from the benchmark.
Planned updates	Scenario update, increased sectoral coverage.

Carbon4 Finance – CIA

(Carbon Impact Analytics for corporates)

As a way to understand the degree of alignment of a given entity with the transition to a low carbon economy, Carbone 4 developed the Carbon Impact Analytics (CIA) methodology in 2015, leveraging their expertise and experience in consulting with corporates from various industries. This methodology has been further enhanced by Carbon4 Finance to measure the contribution of companies (both public and private equity, debt instruments, including green bonds, loans) and sovereign entities to the transition towards a low carbon economy.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; portfolio-level
Connection with other methods developed by the same organisation	Carbon4 Finance also distributes a **CIAscore** for sovereigns and alignment data for infrastructure assets as part of its **CIARA product** (See CIARA methodology review in this appendix). It can also apply **CRREM methodology** for real estate assets (See CRREM methodology review in this appendix).
Output metric(s)	1. Asset- and portfolio-level CIA score: 1 (A+) to 15 (E-); 2. Portfolio-level ITR; 3. Intermediate data available on the different score components.
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	GHG emissions, emissions savings (avoided emissions* and reduced emissions) and forward-looking strategy, based on sector-specific frameworks. The latter covers reduction targets (S1, 2 & 3)*, transition strategy, low-carbon investments, and governance criteria. Dynamic approach including the assessment of past, present, and future performances. The weighting is sector-specific and applies to quantitative and qualitative metrics and scores.
Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data is used to: • Rate the reduction targets S1 & 2, reduction targets S3 in the forward-looking score; • Derive avoided emissions for certain sectors (IEA ETP 2DS 2030 power intensity used as reference to calculate the avoided emissions of the utility sectors e.g.).
Scenario(s) and pathway(s) used	Multiple, including IEA ETP B2DS.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	The CIA overall score can be seen as a proxy for alignment: assets need to have high avoided emissions compared to induced emissions and an adequate forward-looking climate strategy to get the maximum score. Mathematical correspondence between CIA scores and ITR is provided at portfolio level only.
What stage(s) of alignment does the output measure?	Companies with aligned targets can be identified when using the rating of the specific criteria.
Under what condition(s) is a portfolio attributed the best	Be invested in companies that have (i) high emissions savings and (ii) low induced emissions compared to their peers (iii) have

rating (see output metric(s) above for more details)?	an adequate forward-looking climate strategy, in the same proportion as the Euronext LC100 PAB (iv) be invested at least 40% in high-stakes sectors as defined by Carbon4 Finance.
Applicability	
Asset class	Listed and not-listed companies (equity, bonds, loans).
Documentation and detailed method availability	Methodological guide, May 2021
Coverage	41,000 + issuers
Sector coverage	All, split in 60+ in-house sectors, derived from NACE nomenclature and mapped to FactSet industry classification.
Methodology	
General	General approach similar for all assets/portfolios.
Main changes since the publication of the 2020 Alignment Cookbook	Some minor changes
Climate performance input data	• Calculates the induced and saved emissions based on physical indicators or data (inconsistent or incomplete data are corrected using modelled data): o GHG emissions are based on reported scope 1 & 2 data if available and consistent, and reported/estimated scope 3 data for relevant sectors (scope 3 reported data is analysed and challenged to ensure comparability across the sector); o Emissions savings (avoided and reduced emissions) are estimated (even if reported) using a range of methodologies depending on the sector. For some sectors, scenario-based elements are used as inputs (see below). • Evaluates the forward-looking strategy by rating reduction targets (S1, 2 & 3), transition strategy, low-carbon investments and governance. For some sectors, scenario-based elements are used as inputs to evaluate targets (see below).
Focus on the attributes rated using scenario data as an input	• Uses scenario-based data to: o Compute emission savings for certain sectors: for example, the IEA ETP 2DS 2030 power intensity is used as reference to calculate the avoided emissions of the utility sectors e.g.; o Rate scope 1, 2 and 3 decarbonization targets: for homogeneous sectors, category thresholds are built based on IEA benchmark in ETP 2DS scenario using the sectoral decarbonization approach.
Additional analytical step(s)	• Derives the company-level Carbon Impact Analytics score from 1 to 15 (1 being high contribution to climate transition to 15 being incompatible, including a neutral category, also used for low-stake sectors): o Induced and emissions savings under the past and present performances, as well as the forward-looking score are the main predictor of the CIA category of a company; o CIA is bounded per sector based on the ability of the sector to be a solution for the low carbon transition with the use of caps and floors.

Sector/portfolio-level aggregation	• Aggregates asset-level CIA scores to portfolio-level by doing a weighted average by portfolio weights. • Calculates a portfolio-level ITR: o The Intergovernmental Panel on Climate Change (IPCC) RCP 6.0 scenario projects a temperature increase of 3.5°C by the end of the century; o It is benchmarked to a World Large Cap Equity Index, used as a proxy for a 3.5°C climate performance; o 2°C aligned benchmark is based on the average score of the Euronext LC100; o Establish a "sigmoid" curve between the two that translate portfolio score into an Implied Temperature Rise metric; o Bound min/max Implied Temperature Rise score between 1.5°C and 5°C.
Focus on how financial institutions are rated within the methodology	FIs are assessed through a CIA methodology consistent with the Corporate CIA methodology, based on the assessment of the past, present and future performance.
Planned updates	

Carbon4 Finance – CIA

(Carbon Impact Analytics for sovereigns)

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; portfolio-level
Connection with other methods developed by the same organisation	Carbon4 Finance also distributes a CIA score for corporates and alignment data for infrastructure assets as part of its CIARA product. It can also apply CRREM methodology for real estate assets.
Output metric(s)	1. Asset- and portfolio-level CIA score: 1 (A+) to 15 (E-); 2. Portfolio-level ITR; 3. Intermediate data available on the five indicators and three sub-criteria scores (1-15).
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	• Climate pledge alignment*; • Decarbonisation trend*; • Territorial and trade GHG emissions intensity; • Fossil fuel weighted rents; • Fossil fuel subsidies. Weighting at the sub-criteria and criteria-level.
Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data is used to: • Assess climate pledge alignment; • Assess past decarbonization trend alignment.
Scenario(s) and pathway(s) used	Multiple, including IEA ETP and RTS
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Have a past and projected, as in NDCs, carbon emissions trend in line with country-specific decarbonization pathways, low consumption-based intensity and low dependency on fossil fuels.
What stage(s) of alignment does the output measure?	Assets with aligned NDCs and past emissions trend can be identified when using the rating of the specific criteria.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that are given the highest rating, especially the ones with the higher portfolio weight.
Applicability	
Asset class	Sovereign bonds
Documentation and detailed method availability	Please contact Carbon4 Finance.
Coverage	50+ local and regional, 150+ national, and supranational authorities (e.g. European Union).
Sector coverage	All macroeconomic sectors, excluding LULUCF.
Methodology	
General	General approach similar for all assets/portfolios.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in the Alignment Cookbook.

Climate performance input data	• Assesses the asset's based on 5 indicators and 3 sub-criteria: o Climate pledge alignment*; o Decarbonisation trend*; o Territorial and trade carbon emissions intensity; o Fossil fuel weighted rents; o Fossil fuel subsidies. • Supranational issuer data is obtained as a combination of data related to the member countries; • Local entities are assessed with local data when available or through proprietary estimates based on internal consistent ratios and values.
Focus on the attributes rated using scenario data as an input	• Climate pledge alignment: o Compares trend embedded in NDCs (excluding conditional pledges) per unit of GDP with country-specific decarbonization pathways taken from the IEA ETP to derive an ITR related to the sovereign's forward-looking performance. • Decarbonization trend alignment: o Compares trend embedded in past emissions intensity trend per unit of GDP with country-specific decarbonization pathways taken from the IEA RTP to derive an ITR related to the sovereign's past performance.
Additional analytical step(s)	• Derives the country-level Carbon Impact Analytics score from 1 to 15 (1 being high contribution to climate transition to 15 being incompatible) by weighting indicators and sub-criteria: o Climate pledge alignment and decarbonisation trend are weighted into a dynamic alignment score; o Fossil fuel weighted rents and fossil fuel subsidies are weighted into a fossil fuel dependency score; o The dynamic alignment score, carbon intensity and fossil fuel dependency score are weighted to produce the final score.
Sector/portfolio-level aggregation	• Aggregates asset-level CIA scores to portfolio-level by doing a weighted average by portfolio weights; • Calculates a portfolio-level ITR: o Linear interpolation between the bound min/max Implied Temperature Rise score between 1.5°C and 5°C.
Focus on how financial institutions are rated within the methodology	NR
Planned updates	

CDP Net Zero Alignment Dataset

Including the CDP-WWF ambition temperature rating

CDP's Net-Zero Alignment Dataset (NZAD) helps capital markets to identify companies with 1.5°C targets and plans, and engage those without such commitments. The Net-Zero Alignment Dataset includes three company-level outputs: Target ambition (rated with the **CDP-WWF Temperature Rating methodology**), target credibility and emissions & performance. This one-pager focuses on the specific indicators that directly rely on scenario-alignment assessments: CDP-derived ITR, SDA supplement indicators and the Trend Score.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; portfolio-level
Connection with other methods developed by the same organisation	Part of the Net Zero Alignment Dataset which also includes: • Credibility scores (0-100%) based on a transition plan checklist (i.e. has the company disclosed the key elements of what constitutes a credible transition plan); • Target performance scores (tracking how well a company is performing against the assumptions of its targets). CDP distributes a range of other datasets, including Climetrics, and the CDP Climate questionnaire that is used as an input in most of the alignment methodologies available on the market.
Output metric(s)	• **Short, medium, long term ITR** for scope 1 & 2, and aggregated over the 3 scopes (range: 1.5°C to 3.1°C) reflecting target(s)' ambition; • **Supplementary SDA assessments**: % deviation of company's current and targeted physical intensities against a selection of Paris-aligned SDA benchmarks; • **Trend score (ITR)** reflecting what would a company's ITR would be if it formulated a short-term target ambition aligned with its recent emissions reduction.
Scenario(s) and pathway(s) used	• IPCC SR 1.5 precautionary scenarios; • IEA/SBTi scenarios for SDA assessments (physical intensity trajectories at sector level).
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	• Warming function: Have one or several emission reduction targets with the appropriate coverage and in line with the required emissions decarbonization rate under a selection of IPCC precautionary scenarios; • SDA: Have a physical intensity target(s) expressed in the required metric, covering the required scope(s), and the right ambition based on IEA/SBTi scenarios.
What stage(s) of alignment does the output measure?	It is possible to identify in the dataset: • Assets that have an appropriate level of "ambition". See other NZAD indicators.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in companies that have set decarbonization targets over the right scope, perimeter and with an appropriate ambition, or validated SBTi targets.
Can the users access the derived alignment benchmark(s) data against	• Users can access asset-level "aligned" benchmark data through the code provided on SBTi website;

which assets/portfolios are evaluated?	• The parameters of the regression model's equation are provided in one of the technical annexes to CDP/WWF methodology; • SDA assessments are made using IEA and SBTi scenarios, from which physical intensity pathways are derived.
Applicability	
Asset class	Listed equity and corporate bonds.
Documentation & detailed method availability	• Temperature rating methodology, 2020; • NZAD.
Coverage	Paying dataset; 22 000 companies based on CDP disclosures, 5 400 of which have a non-default scope 1+2 ITR for the mid-term timeframe. All companies can be scored, regardless of if they have public targets or not.
Sector coverage	All macroeconomic sectors.
Methodology	
General	Applies different benchmark construction methods depending on data availability (e.g. SDA, Absolute contraction based on the warming function).
Main changes since the publication of the 2020 Alignment Cookbook	• Introduction of an additional class of benchmark for ITR computation (SDA); • Introduction of new metrics.
Scenario input data	• Uses scenario data to derive a decarbonization benchmark for each asset in portfolio and assess its (mis)alignment; • Uses IEA/SBTi scenarios and sector-specific benchmarks for companies that can be assessed using the sectoral decarbonization approach (Power, Heavy Industry (Aluminium, Cement, Paper, Steel), Transport (Passenger Aviation, Heavy Road Freight, Rail Freight, Shipping), Commercial Buildings); • Uses the IPCC SR 1.5 scenario set for other companies: o Creation of a scenario set that matches a normative precautionary preference in regard to overshoot and CDR; o Development of best-fitting linear regression models to describe the relationship between scenario variables (matching the general structure of corporate GHG targets) and end of century temperature outcomes; o Derives sector-specific benchmarks where possible. • Uses three approaches depending on data availability to derive benchmarks (classified by order of preference): o Uses sectoral benchmarks in physical emissions intensity for SDA sector; o Uses the absolute contraction approach: the benchmarks are derived by assuming that absolute emissions should decrease at the same rate;

	○ Uses the GEVA approach where intensity per unit of revenue: The benchmarks are derived by assuming that emissions per unit of value add should decrease at the same rate (economic intensity contraction).
Climate performance input data	• Gathers reported past and current emissions, and disclosed corporate targets; • Harmonizes corporate targets to the same time horizon, scope and metric and decides whether the targets fit the minimum coverage requirements: ○ The methodology analyses GHG emissions targets on scope 1 and 2; and scope 1, 2 and 3 targets (2 separate analysis).
Alignment assessment	• Ambition ITR: ○ Classified targets as short term (2023-2029), midterm (2030-2035) and long term (2035+); ○ Companies evaluated with the SDA approach: assess the distance between the targeted emissions intensity and the sector benchmark(s), using point-in-time assessment and interpolation; ○ Other companies: ▪ Measures the implied target decarbonization rate between the target base year and the target year; ▪ Compares the rate with what is expected under the derived decarbonization benchmarks and attributes a temperature based on interpolation (i.e. using multiple pathways corresponding to different temperatures); ▪ Derives a scope 1, 2 and 3 ITR, and calculates an aggregated one at company-level using relative scope 1, 2 and 3 emissions (both reported and estimated where disclosure is not available). • Overwrites the results: ○ Assets with a validated SBTi are attributed their SBT-derived ITR; ○ Automatic 3.1°C to assets that do not have an appropriate decarbonization target over the specific scope/time horizon under consideration. • SDA Supplement: For companies assessed using the SDA approach, calculates the percentage deviation in current and targeted emissions intensity (per unit of production) with the derived benchmarks; • Trend score (ITR): Use the past 3-5 years scope 1 and 2 emissions' trend and compare it to the derived benchmark(s) over the next 3-5 years to attribute a temperature score.
Additional analytical steps	See additional indicators in the NZAD.

Sector/portfolio-level aggregation	Aggregates asset-level alignment assessment results: multiple weighted averages approaches possible: enterprise-owned (recommended), total emissions, or portfolio weights.
Focus on how financial institutions are rated within the methodology	No differentiated approach. 1.5°C scope 3 assessments are exclusively carried out using the warming function (Absolute Contraction).
Planned updates	

Clarity AI

Net Zero Alignment

Clarity AI's Net Zero Alignment solution is a fully automated solution to assess the alignment of assets and portfolios to Net Zero pathways according to the Net Zero Investment Framework. It is based on a transparent and systematic methodology and leverage datasets from CDP, the SBTi and proprietary data collection campaigns, with full visibility to users on the underlying data.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset; portfolio-level
Connection with other methods developed by the same organisation	Near-term temperature alignment (based on **CDP-WWF methodology,** see CDP-WWF Temperature Rating methodology review in this appendix) is used as an input in one of the criteria.
Output metric(s)	Alignment bucket (achieving net zero, aligned, aligning, committed to aligning, not aligned). Achieving net zero is not assigned to any asset in the covered universe.
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	1. Ambition: tracks the existence of a long-term Net Zero commitment by 2050; 2. Targets*: measures the Temperature Alignment of near-term targets; 3. Emissions performance: measures the progress of achieved reductions compared to targets; 4. Disclosure: tracks the disclosure of scopes 1, 2 and 3 emissions; 5. Decarbonisation Strategy: tracks the existence of a low-carbon transition plan. Weighted using maturity scale.
Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data is used to derive a decarbonization benchmark to assess near-term targets misalignment (one criteria in the maturity scale).
Scenario(s) and pathway(s) used	As in **CDP-WWF Temperature Rating methodology**: IPCC SR 1.5 precautionary scenarios (See CDP-WWF Temperature Rating methodology review in this appendix).
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Asset are rated "aligned" if they have: • a) High impact companies: Net Zero commitment by 2050; scope 1+2 short- or medium-term targets aligned with 1.5°C (scope 3 with 2°C); Achieved emissions reductions on-track with target; disclosure on all materials emissions; decarbonisation Strategy; • b) Other companies: scope 1+2 short- or medium-term targets aligned with 1.5°C (scope 3 with 2°C); Achieved emissions reductions on-track with target; disclosure on all materials emissions. Assets are rated "aligning" if they have: • a) High impact companies: scope 1+2 short- or medium-term targets aligned with 1.5°C-2°C; disclosure on all materials emissions; decarbonisation Strategy;

	• b) Other companies: scope 1+2 short- or medium-term targets aligned with 1.5°C-2°C; disclosure on all materials emissions. Assets are rated "committed to aligning" if they have: • Net Zero commitment by 2050.
What stage(s) of alignment does the output measure?	Companies with an aligned ambition can be identified when using the rating of the specific criteria.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in companies that are rated "Aligned" (see above).
Applicability	
Asset class	All equity and corporate bonds.
Documentation and detailed method availability	Climate Module Methodology, June 2023
Coverage	36,000 companies
Sector coverage	All macro-economic sectors.
Methodology	
General	Criteria taken into account and maturity scale approach vary based on the sector (high-impact/other companies).
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Climate performance input data	• Classifies assets as high impact/other: o Uses the classification of the **PAII NZIF** (See PAII NZIF methodology review in this appendix): high-impact companies include companies on the Climate Action 100+ focus list, companies in high impact sectors consistent with Transition Pathway Initiative sectors; banks; and real estate. • Assesses the following criteria based on the **PAII NZIF maturity scale methodology** (See PAII NZIF methodology review in this appendix): 1. Ambition: tracks the existence of a long-term Net Zero commitment by 2050; 2. Targets: measures the Temperature Alignment of near-term targets; 3. Emissions performance: measures the progress of achieved reductions compared to targets; 4. Disclosure: tracks the disclosure of scopes 1, 2 and 3 emissions; 5. Decarbonisation Strategy: tracks the existence of a low-carbon transition plan (only for high-impact sectors).
Focus on the attributes rated using scenario data as an input	• Assesses Targets (criteria 2) using the **CDP-WWF Temperature rating methodology** (see CDP-WWF Temperature Rating methodology review in this appendix); • Focusses on near- and medium-term targets, up to 2035; • scope 1, 2 and 3 targets are rated separately. scope 3 target assessments are optional;

	• Overwrites the result for companies with a validated SBTi target.
Additional analytical step(s)	• Classifies companies in alignment buckets based on the following maturity scale: No asset can be rated “achieving net zero”. Asset are rated “aligned” if they have: • a) High impact companies: Net Zero commitment by 2050; scope 1+2 short- or medium-term targets aligned with 1.5°C (scope 3 with 2°C); Achieved emissions reductions on-track with target; disclosure on all materials emissions; decarbonisation Strategy; • b) Other companies: scope 1+2 short- or medium-term targets aligned with 1.5°C (scope 3 with 2°C); Achieved emissions reductions on-track with target; disclosure on all materials emissions. Assets are rated “aligning” if they have: • a) High impact companies: scope 1+2 short- or medium-term targets aligned with 1.5°C-2°C; disclosure on all materials emissions; decarbonisation Strategy; • b) Other companies: scope 1+2 short- or medium-term targets aligned with 1.5°C-2°C; disclosure on all materials emissions. Assets are rated “committed to aligning” if they have: • Net Zero commitment by 2050.
Sector/portfolio-level aggregation	Calculates the proportion of portfolio value per each level.
Focus on how financial institutions are rated within the methodology	Similar approach. Financial Institutions are considered material sectors. scope 3 category 15 emissions are considered material.
Planned updates	Q4 2023/Q1 2024: visualization of targets and past and projected emissions at company-level. Addition of NZIF's criteria 6 “Capital Allocation Alignment”. 2024: include sovereign bonds, target management for financial institutions.

ESG Book

Decarbonisation Analytics Suite (Net Zero Alignment)

ESG Book provides an ITR alignment score which highlights the 2030 and 2050 ITR of the company based on their emissions impact thus far. ESG Book provides separate ITRs for scope 1+2 and scope 1+2+3 to provide ways of comparing companies across their full value chain but also for the most commonly disclosed scope 1+2 emissions only.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; portfolio-level
Connection with other methods developed by the same organisation	In addition to the ITR scores, the Decarbonisation Analytics suite consists of: • An emissions reporting quality score (0-5 scale); • A target alignment section which assesses companies' performance against their approved emissions reduction targets.
Output metric(s)	Near and long-term ITR scores (1.1°C to 10°C).
Scenario(s) and pathway(s) used	IEA WEO 2023 for Stated Policies Scenario (2.5C), Announced Pledges Scenario (1.7°C) and Net Zero Emissions by 2050 Scenario (1.5°C), up to 2050.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Have absolute cumulative scope 1 and 2 GHGs emissions (or scope 1, 2 and material scope 3 emissions) equal to its sector-specific Net Zero benchmark budget between now and 2030/2050.
What stage(s) of alignment does the output measure?	It is possible to identify in the dataset assets that: • Have already achieve the required GHG intensity (net zero end state); • Have a projected performance, based on past performance trend, sufficient to keep absolute emissions within budget (to 2030/2050). Alternative datasets, such as past trend alignment with targets, can be used to assess companies' performance against their approved emissions reduction targets.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Not applicable at this stage. Coming soon in H1 2024.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access asset-level benchmark "aligned" data.
Applicability	
Asset class	Publicly listed companies
Documentation & detailed method availability	Coming soon and will be available once the product is launched late 2023.

Coverage	Paying dataset; ~40,000 companies based on size and involvement/coverage in initiatives (SBTi, CA100+ and TCFD e.g.).
Sector coverage	All macroeconomic sectors
Methodology	
General	Uses similar approach for all assets/portfolio.
Main changes vs Cookbook	Version upgrade to the S-Ray Temperature Score, which includes new methodology, updated benchmarks and more analytic outputs.
Scenario input data	• Uses scenario data to derive a decarbonization benchmark for the asset under consideration and assess its (mis)alignment; • Builds sector and geography-specific benchmarks for each scope of emissions and for each scenario pathway: o IEA WEO Scenarios 2023 for Stated Policies Scenario (2.5°C), Announced Pledges Scenario (1.7°C) and Net Zero Emissions by 2050 Scenario (1.5°C), up to 2050; • Uses the absolute emissions contraction principle: the absolute emissions of all assets within the same sector/geography are required to decrease at the same rate.
Climate performance input data	• Collects reported data on scope 1, 2 and 3 GHGs emissions; • Estimates scope 1, 2 and 3 emissions when the asset does not report it, or reports it incompletely; • Forecasts future emissions based on historical emission trends (last 5 years available).
Alignment assessment	• Compares current company cumulative emissions based on past and present emissions performance with what it needs to be under different scenarios to 2030 and 2050; • Calculates the ITR score by interpolation (i.e. using multiple pathways corresponding to different temperatures); • The ITR score covers scope 1 and 2, as well as scope 1, 2 and material scope 3 emissions for two time horizons, 2030 and 2050; • ITR is clipped at a minimum of 1.1°C to reflect the current temperature rise above pre-industrial levels and a maximum of 10°C to reflect the potential of temperature rise if every company emits the same amount of emissions.
Additional analytical steps	NR
Sector/portfolio-level aggregation	Coming soon in H1 2024. More details to follow.
Focus on how financial institutions are rated within the methodology	As other sectors: cumulative scope 1 and 2 emissions (or scope 1, 2 and scope 3 material emissions) are compared to the benchmarks as derived from the IEA scenario. The outputs are four ITRs for the two scope combinations for the time horizon of 2030 and 2050.
Planned updates	Portfolio aggregation methodology (planned for H1 2024).

EthiFinance

Science-Based Temperature Trajectory (corporate)

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; portfolio-level
Connection with other methods developed by the same organisation	**Sovereign ITR** (See EthiFinance Science-Based Temperature Trajectory (Sovereign) methodology review in this appendix).
Output metric(s)	Average ITR (categorical, range: 2°C to 5°C) for different time horizon (2030 - 2050) and GDP growth assumptions (1 - 6%).
Scenario(s) and pathway(s) used	IPCC RCP scenarios (from 1.9 to 8.5).
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Depends on the sector: 1. SDA sectors: Have a historical physical emissions intensity reduction rate in line with the RCP 1.9 (below 1.5°C) or 2.6 (just below 2°C) for the time horizon and growth assumption chosen, or a validated SBTi post 2030; 2. GEVA sectors: Have a historical economic emissions intensity reduction rate in line with the RCP 1.9 (below 1.5°C) or 2.6 (just below 2°C) for the time horizon and growth assumption chosen, or a validated SBTi post 2030; 3. GEVA sectors: Have a historical absolute emissions reduction rate in line with the RCP 1.9 (below 1.5°C) or 2.6 (just below 2°C) for the time horizon and growth assumption chosen, or a validated SBTi post 2030.
What stage(s) of alignment does the output measure?	It is possible to identify in dataset, for companies analysed using GEVA and absolute contraction: 1. Assets that have aligned targets; 2. Assets that have decarbonized at the right pace in the past.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that are given the maximum rating. Uses a range of aggregation approaches that put more or less weight on different type of assets (with higher emissions, with largest exposure…).
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access the asset-level benchmark data.
Applicability	
Asset class	Corporate equity and bonds
Documentation & detailed method availability	1. "Science-Based Temperature Trajectory, Methodology", October 2022; 2. Research paper: "Does the thermometer define the temperature? Acritical look at portfolio temperature models", Edouard Pineau, June 20, 2023.
Coverage	European corporates
Sector coverage	All macroeconomic sectors.
Methodology	

General	Uses three approaches depending on the sector: SDA, GEVA, and absolute contraction methods.
Main changes vs Cookbook	Not included in Alignment Cookbook.

Scenario input data	• Uses scenario data to derive a decarbonization benchmark for each asset in portfolio and assess its (mis)alignment;
	• Builds benchmarks at and asset-level for each RCP temperature outcome and under different growth assumptions:
	  o Uses are IPCC RCP scenarios (from 1.9 to 8.5).
	• Uses three approaches depending on the sector type and data availability to derive benchmarks:
	  o Uses the SDA approach for homogeneous sectors with production projections available: The benchmarks are derived by assuming that emissions per unit of production should converge to the same sectoral level in 2050 (intensity convergence principle);
	  o Uses the GEVA approach for other sector with value add projections available: The benchmarks are derived by assuming that emissions per unit of value add should decrease at the same rate (economic intensity contraction);
	  o Uses the absolute contraction approach for all others: the benchmarks are derived by assuming that absolute emissions should decrease at the same rate;
	  o The GEVA and absolute contraction approaches are based on sector-agnostic/geography-specific benchmarks.
	• SDA sector split: based on the SBTi classification - Buildings (Services/commercial buildings), Transport (Aviation, Rail, Heavy road, Light road), Industry (Pulp and paper, Chemicals and petrochemicals, Aluminium, Iron and steel, Cement), Electricity and Heat (Power generation), Other sectors;
	• Geography-split: OECD, Asia, Middle East and Africa, Latin America;
	• Uses different GDP growth assumptions to recalculate the expected decarbonization rate required for each temperature outcome for the approach relying on emissions per unit of revenue.

Climate performance input data	• Collects disclosed emissions (carbon, methane and nitrogen oxides) and estimates missing data using a range of approaches (energy consumption models, input-output analysis, regression);
	• Uses three different types of metric to measure climate performance depending on the sector:
	  o GHG emissions per unit of production;
	  o GHG emissions per unit of revenue;
	  o Absolute GHG emissions.
	• Covers scope 1 and 2 emissions;

	• Projects climate performance using historical extrapolation (all available data); SBTi targets (optional). Where an intensity metric is used to measure climate performance, different production and GDP growth assumptions are used.
Alignment assessment	• Compares the asset-level GHG emissions trend with the expected trend in different RCP scenarios, over different time horizons; • Uses SBTi target time horizon and temperature to adjust calculated temperature. The closer the target's horizon, the more weight given to the temperature, since the probability of reaching the target decreases; • Calculates a range of ITR scores using distance to different temperature trajectories, for different time horizons and growth assumptions (interpolation).
Additional analytical steps	Provides a unique ITR at asset or portfolio-level that depends on different parameters that can be changed: the expected growth rate, the expected GHG pathways (taking into account the past and the time horizon). Hence, a more probable ITR by using specific likely parameters can be provided.
Sector/portfolio-level aggregation	Aggregates the asset-level results of the alignment assessment results at portfolio level: weighted average by ad-hoc allocation weights (capitalization, total GHG emissions, share of total counterparty value held (e.g. for equities), share of debt held to total assets (e.g. for bonds), other information given by the portfolio manager).
Focus on how financial institutions are rated within the methodology	Same approach as for other sectors. If the portfolio composition is known, can be used to derive the FI ITR.
Planned updates	

EthiFinance

Science-Based Temperature Trajectory (Sovereign)

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; portfolio-level
Connection with other methods developed by the same organisation	
Output metric(s)	Average ITR (categorical, range: 2 to 5°C) for different time horizon (2030 - 2050) and GDP growth assumptions (1 - 6%).
Scenario(s) and pathway(s) used	IPCC RCP scenarios (from 1.9 to 8.5).
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Depends on data availability: 1. Have a historical economic emissions intensity reduction rate in line with the RCP 1.9 (below 1.5°C) or 2.6 (just below 2°C) for the time horizon and growth assumption chosen; 2. Have a historical absolute emissions reduction rate in line with the RCP 1.9 (below 1.5°C) or 2.6 (just below 2°C) for the time horizon and growth assumption chosen.
What stage(s) of alignment does the output measure?	It is possible to identify in dataset assets that have decarbonized at the right pace in the past.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that are given the maximum rating. Uses a range of aggregation approaches that put more or less weight on different type of assets (with higher emissions, with largest exposure…).
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access the asset-level benchmark data.
Applicability	
Asset class	Sovereign
Documentation & detailed method availability	Science-Based Temperature Trajectory (SB2T) – sovereign
Coverage	Countries, regions, territorial collectivities.
Sector coverage	All sectors, including LULUCF.
Methodology	
General	Uses two approaches depending on data availability.
Main changes vs Cookbook	Not included in Alignment Cookbook.
Scenario input data	• Uses scenario data to derive a decarbonization benchmark for each asset in portfolio and assess its (mis)alignment; • Builds country-specific benchmarks at asset-level for each RCP temperature outcome and under different growth assumptions: o Uses are IPCC RCP scenarios (from 1.9 to 8.5); o Uses different GDP growth assumptions to recalculate the expected decarbonization rate required for each temperature outcome.

	• Uses two approaches depending on data availability to derive benchmarks: o The benchmarks are derived by assuming that emissions per unit of (GDP) should decrease at the same rate (intensity contraction); o The benchmarks are derived by assuming that absolute emissions should decrease at the same rate.
Climate performance input data	• Collects disclosed emissions; • Uses two types of metric to measure climate performance depending on data availability: absolute emissions or intensities; • Projects climate performance using historical extrapolation (all available data). Where an intensity metric is used to measure climate performance, different production and GDP growth assumptions are used.
Alignment assessment	• Compares the asset-level GHG emissions trend with the expected trend in different RCP scenarios, over different time horizons; • Calculates a range of ITR scores using distance to different temperature trajectories, for different time horizons and growth assumptions (interpolation).
Additional analytical steps	Provides a unique ITR at asset or portfolio-level that depends on different parameters that can be changed: the expected growth rate, the expected GHG pathways (taking into account the past and the time horizon). Hence, a more probable ITR by using specific likely parameters can be provided.
Sector/portfolio-level aggregation	Aggregates the asset-level results of the alignment assessment results at portfolio level: portfolio weight and/or ownership approach; other information given by the portfolio manager).
Planned updates	

Ethos

Temperature Score

Ethos Temperature Score answers the question: What would be the global temperature rise if all companies acted with the same level of climate ambition and credibility as the analysed company? It is a forward-looking assessment that evaluates how a company's activities and strategy are consistent with climate science. The Temperature Score can then be aggregated at the portfolio level to measure the portfolio's alignment with climate objectives. The Temperature Score is constructed by comparing a company's adjusted emissions with the available carbon budget to limit global warming to 1.5°C over the 2010-2050 period. A company's adjusted emissions are estimated on the basis of historical data, disclosed targets and Ethos' climate credibility score.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; portfolio-level
Connection with other methods developed by the same organisation	Part of the **Transition ratings**, together with the **Climate Risk Rating**.
Output metric(s)	• ITR (continuous, in °C); • Climate ambition score (target's alignment); • Company credibility score; • Target achievement score; • Carbon sinks credibility score; • Temperature assuming all targets are met; • Average temperature of the company's sector; • Percentage of emissions covered by the climate targets.
Scenario(s) and pathway(s) used	Use TPI pathways mainly derived from IEA scenarios for high-stakes sectors; UN Emissions Gap report and IPCC AR6 for low-stakes sectors.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Have their cumulative past, current and projected emissions (scope 1, 2 and/or 3) to 2050 within their sector budget, expressed in intensity per unit of revenue for low stakes sectors (sector-agnostic) and per unit of production for high stakes sectors (sector-specific).
What stage(s) of alignment does the output measure?	Is it possible to identify in the dataset: • Assets that have an "aligned target"; • Assets that have an "aligned projected performance", including the credibility weighting.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	The portfolio's assets aggregated past, current and projected GHGs emissions should be within budget, as defined by the budget of its individual constituents.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access asset benchmark data in the original sources and methodology document.
Applicability	
Asset class	Corporate
Documentation & detailed method availability	Ethos Climate Transition Ratings, Methodology (June, 2023)

Coverage	+2,000 companies for the first release.
Sector coverage	All macroeconomic sectors except the financial sector for the moment.
Methodology	
General	Uses two approaches depending on the sector (high-carbon/low-carbon): • SDA for high-stakes sectors; • Economic intensity contraction for low-stakes sectors.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in the Alignment Cookbook.
Scenario input data	• Uses scenario data to derive a decarbonization benchmark for the asset/portfolio under consideration and assess its (mis)alignment; • Builds benchmark at two levels of aggregation (portfolio-level and asset-level): o Use TPI pathways mainly derived from IEA scenarios for high-stakes sectors; o UN Emissions Gap report and IPCC AR6 for low-stakes sectors. • Expresses the benchmark differently for high-stakes (based on TPI) and low-stakes sectors (all others): o High-stakes sectors: physical intensity, as taken from TPI based on IEA scenarios and data; o Low-stakes sectors: economic intensity per unit of GDP. Derives an intensity pathway per unit of economic output making future growth assumptions.
Climate performance input data	• Uses disclosed and/or estimated GHG emissions per unit of production/revenue to measure climate performance: o Includes relevant scope for high-stakes sectors; o Includes scope 1, 2 and 3 for low-stakes sectors. • Uses estimates from third-party or derived internally using various statistical approaches; • Estimates the future climate performance of each company based on: o Disclosed decarbonization targets; o Past emissions (average over the three past years); o Credibility-weighting factor. • Derives a credibility-weighting factor based on 1. The achievement of the company's past and ongoing targets, referred to as the target achievement credibility assessment, 2. The company's **ACT rating** (see methodology review in the appendix), if available, 3. The use (actual or planned) of carbon sinks; • Adjusts targeted emissions using the credibility-weighting factor.
Alignment assessment	• Performs alignment assessment at issuer-level and at portfolio-level; • Calculates the cumulated overshoot/undershoot of carbon emissions relative to the sector temperature benchmark between 2010 and 2050; • Calculates the ITR score using TCRE.

Additional analytical steps	NR
Sector/portfolio-level aggregation	Aggregates the asset-level input data to perform alignment assessment at portfolio-level: carbon budget approach, financed emissions.
Focus on how financial institutions are rated within the methodology	NR
Planned updates	Continuously, minimum annually.

FTSE Russell

Implied Temperature Rise scores

The global "implied" temperature of a country (implied 2100 global temperature warming based on the trajectory of the country or entity's commitment or policies) represents an expected global temperature assessment for 2100 if all entities had the same level of ambition as the entity analysed (i.e the same gap between the projected emissions following a certain trajectory-following the policies or commitments- and the allowable emissions given by **CLAIM methodology**).

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; portfolio-level
Connection with other methods developed by the same organisation	FTSE Russell sources the information and calculates the **TPI Management Quality Score**.
Output metric(s)	Implied temperature Rise Score & distribution (range: 1.2 °C to 10 °C).
Scenario(s) and pathway(s) used	Pathways from the Transition Pathway Initiative.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	1. Have a decarbonization target that is sufficient to stay within the TPI-derived country & sector-specific carbon budget; 2. Have decarbonized its historical absolute emissions at a rate that is sufficient for the company to stay within the TPI-derived country & sector-specific carbon budget if it continues on this trend.
What stage(s) of alignment does the output measure?	Possible to identify: 1. Assets that have the required emission trajectory to meet a 1.5 °C scenario; 2. Assets that have an aligned disclosed target.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that are given the maximum rating - especially those that contribute the most to the portfolio financed emissions.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Yes, TPI scenarios are available on TPI website.
Applicability	
Asset class	Listed equities
Documentation & detailed method availability	Exploring ITR scores: Framing robust company-specific benchmarks and future company-level GHG emissions ranges (2022).
Coverage	Paying dataset (11,000 companies).
Sector coverage	All macroeconomic sectors.
Methodology	
General	General approach similar for all assets/portfolios.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.

Scenario input data	• Uses scenario data to derive a decarbonization budget for each asset in portfolio and assess its (mis)alignment; • Uses the Transition Pathway Initiative pathways for nine sectors; derives new pathways for additional sectors and scopes (e.g. Oil & Gas and coal scope 3); • Attributes a budget to the asset under consideration using a fair share approach based on revenue in sector.
Climate performance input data	• Uses reported scope 1 and 2 data; scope 3 (Oil & Gas and coal only) reported data where available and estimated based on physical production; • Projects future climate performance based on decarbonization targets (over the target time horizon) or historical extrapolation (over 5 years): o Estimates a range of probable emissions beyond the target's time horizon - upper bound is the target level and lower bound is derived from the IIPCC scenario RCP 2.6; o Estimates a range of probable emissions beyond the first 5 years for companies with no targets: the following 10 years are built as a range derived from IPCC's RCP 2.6 and RCP 8.5 scenarios; the range is extended until 2050, where the upper bound of the range progressively decreases.
Alignment assessment	• Quantifies the absolute GHG emissions overshoot/undershoot between 2020 and 2100 compared to the allocated budget; • Applies a TCRE coefficient to convert the overshoot/undershoot to a temperature metric.
Additional analytical steps	Computes the minimum, mean and maximum temperature of a portfolio by aggregating the minimum, mean and maximum company-level temperatures.
Sector/portfolio-level aggregation	Aggregates asset-level alignment assessment results: multiple approaches possible, with a preference for weighted average by asset-level financed emissions relative to portfolio-level financed emissions (ownership based on EV).
Focus on how financial institutions are rated within the methodology	Financials are rated, without inclusion of scope 3 financed emissions for the moment.
Planned updates	NR

ICE

Climate Transition Analytics Platform (Formerly Urgentem Element6 Platform)

On the ICE CTA Platform, users can analyse a range of climate transition relevant metrics, including carbon footprinting, corporate emission disclosure quality, scope 3 emission hotspots, stranded assets and avoided emissions. It also provides the ability for users to perform net zero analysis and calculate the implied temperature rise (ITR) of an asset or portfolio. The ITR calculations consider company level historical emission performance and emission reduction targets and evaluate companies against sector-specific scenario-aligned emission reduction rates.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; Portfolio-level
Connection with other methods developed by the same organisation	ICE also distributes an ITR score (at asset- and portfolio-level) using the **CDP WWF Temperature rating methodology** (see CDP-WWF Temperature Rating dataset review in this appendix).
Output metric(s)	• ITR (continuous scale, rounded to two decimal places and capped at a maximum of 5 °C); • Cumulative over/undershoot expressed in absolute emissions.
Scenario(s) and pathway(s) used	User-defined: SSPs (SSP3-Baseline, SSP5-Baseline, SSP2-45, SSP1-26, SSP1-19), NGFS scenarios (both phase 3 and phase 4), IEA scenarios.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Companies that a) have reported good quality emissions data historically (such as complete operational coverage) showing that they have reduced their emissions (relative to their revenue growth), and b) have strong decarbonisation targets, compared to sector-specific decarbonization benchmark(s).
What stage(s) of alignment does the output measure?	It is possible to identify in the dataset: • Assets that have current emissions at, or below, their allocated 2050 emissions, due to strong historical decarbonization efforts assessed using their reported historical emissions; • Assets that have an aligned target; • Assets whose reported historical emissions, show that their historical decarbonisation efforts were aligned to a benchmark scenario in the past.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	The portfolio should be invested in assets that have already made emission reductions and/or have commitments to do so, especially the assets that make the largest contribution to the portfolio's financed emissions (those which have both a large weight in the portfolio and a high emission intensity). The portfolio level ITR is based on historical and expected future changes in the financed emissions of the portfolio. The portfolio's annual expected financed emissions are shown compared to what they would need to be to be aligned to a particular scenario.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access asset-, sector-, and portfolio-level "aligned" benchmark data.

Applicability	
Asset class	Listed equity & corporate bonds.
Documentation & detailed method availability	Available on request.
Coverage	Around 30,000 securities, with 9,000+ issuers analysed for reported data (can be expanded to private companies upon client request).
Sector coverage	All macroeconomic sectors.
Methodology	
General	General approach similar for all assets/portfolios.
Main changes since the publication of the 2020 Alignment Cookbook	Prior version of the data platform did not include an ITR calculation.
Scenario input data	• Uses scenario data to derive decarbonization benchmarks for the asset/portfolio under consideration and assess its (mis)alignment; • Uses scenarios defined by users: SSPs (SSP3-Baseline, SSP5-Baseline, SSP2-45, SSP1-26, SSP1-19), NGFS (phase 3 and phase 4), or IEA scenarios; • Derives benchmarks built at two levels of aggregation: o Option 1: Financial asset; o Option 2: Portfolio (based on financial asset composition). • Derives benchmarks at asset- and portfolio-level based on the absolute emissions contraction principle, using sector- and region-specific decarbonisation rates.
Climate performance input data	• Uses historical emission reductions and projected absolute emissions to measure climate performance; • Includes scope 1, 2 & 3 (for all sectors); • CO_2/CO_2e; • Uses disclosure data and derives estimated data using statistical approaches based on peer disclosure (incl. average); • Uses decarbonization targets and sectoral/regional trends to project climate performance; • Past climate performance is included in the alignment assessment if reported data is available.
Alignment assessment	• Performs the alignment assessment at financial asset-level and portfolio-level; based on cumulative over/undershoot (2015-2050); • Linear regression to find the relationship between the cumulative emissions of the company's/portfolio's scenario-aligned pathways and the scenario temperature. Use the relationship to attribute a temperature to the company/portfolio.
Additional analytical steps	Not applicable
Sector/portfolio-level aggregation	Aggregation of asset-level emissions data to perform alignment assessment at portfolio-level. This is based on an ownership approach, calculating the portfolio's financed emissions based on the user defined market value (EVIC, EV, market capitalization, market capitalization + total debt).
Focus on how financial institutions are rated within the methodology	Financial sector treated in the same way as all others. The scope 3 decarbonisation benchmarks for the financial sector are based on global emissions from the relevant scenarios databases, and

	therefore do not take into account the specific sectors or regions that the financial institute may have invested in, which could change over time. Scope 3 emission reduction targets are considered in the expected pathways.
Planned updates	

Iceberg Datalab – SB2A (dataset)

(Science-Based Alignment Approach)

SB2A – Science-Based Alignment Approach is a Climate approach developed in 2017 and operated by Iceberg Data Lab. It calculates the carbon footprint of each corporate and real assets through a bottom-up approach allowing to distinguish issuers based on the impact of their product flows throughout their value chain (including scope 3 when material). The model calculates an ITR, which appraises the alignment of each issuer with its sectoral decarbonisation benchmark, based on scientific sources (SBT, SDA, etc.).

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; portfolio-level
Connection with other methods developed by the same organisation	**SB2A for sovereigns** (see Iceberg Datalab SB2A – Sovereign bonds review in this appendix).
Output metric(s)	• ITR (continuous, 0.5°C – 6.5°C); • Over/undershoot expressed in quantity of GHGs (absolute); • Presence of SBT validation, ACT rating, issuers' target.
Scenario(s) and pathway(s) used	IEA ETP for all Sectoral Decarbonisation Approach trajectories. IPCC RCP2.6 for default methodology.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Have a past and forecasted (based on targets and past performance) year-on-year rate of decarbonization per unit of production in line with its company-specific intensity benchmark, converging to the required sector-level intensity by 2050 or have a current GHG intensity already at net zero level.
What stage(s) of alignment does the output measure?	The ITR combines past, current and projected alignment, based on targets and/or historical extrapolation. It is possible to identify in the dataset: 1. Assets that have an aligned target based on cumulative analysis; 2. Assets that are projected to respect their budget in the future, based on historical trends. Upon request only: 1. Assets that already operate at their net zero level; 2. Assets that have respected their budget in the past, based on decarbonization benchmarks.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that are given the highest rating, especially the ones with the higher portfolio weight.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	No
Applicability	
Asset class	Listed equity & corporate bonds, Real Estate and Infrastructure, Private companies.

Documentation & detailed method availability	SB2A Methodology, September 2021. Current update WIP.
Coverage	3500 issuers
Sector coverage	• All macroeconomic sectors; • Residential and Commercial Real Estate; • Brown and green field infrastructure.
Methodology	
General	General approach similar for all assets/portfolios.
Main changes since the publication of the 2020 Alignment Cookbook	All sectors are now analysed using the "bottom-up" approach.
Scenario input data	• Uses scenario data to derive a decarbonization benchmark for each asset in the portfolio and assess its (mis)alignment: o IEA ETP for all Sectoral Decarbonisation Approach trajectories; o IPCC RCP2.6 for the default methodology; o When IPCC is used, inclusion of future sectoral growth assumptions to adjust the carbon budget and pathways. • Derives sector-specific benchmark for corporate and infrastructure assets (50+ benchmarks); sector-specific & geography-specific for real estate assets (10 geographies): o Uses the SDA approach: the benchmarks are derived by assuming that the GHG emissions per unit of production of assets operating in the same sectors should converge to the same level in 2050 (physical intensity convergence principle).
Climate performance input data	• Uses GHG emissions per unit of production to measure climate performance: o Scope 1, 2, and 3 emissions are included where relevant. • Relies on estimated data under certain conditions (no reporting), derived using input-output modeling, statistical approaches based on peer disclosure (incl. averages), bottom-up approaches (LCA, physical asset-level approaches), other custom estimation models; • Projects climate performance using decarbonization targets or historical extrapolation.
Alignment assessment	• Calculates the cumulative emissions over(under)shoot at asset-level between 2010 and 2050; • Applies a TCRE coefficient to convert the overshoot/undershoot to a temperature metric.
Additional analytical steps	No
Sector/portfolio-level aggregation	Aggregates the asset-level alignment assessment results: weighted average by investment value relative to portfolio value.
Focus on how financial institutions are rated within the methodology	Includes financial institutions' scope 3 by modeling loan book financed emissions. The carbon intensity is expressed in tCO_2e/M€ of their loan books and compared to global & cross-sectoral decarbonization benchmarks.
Planned updates	Future updates are planned to include 1.5°C trajectory when available, updates of the reference trajectory according to the

	latest sources, aggregation of carbon intensities by service provided within trajectories.

Iceberg Datalab – SB2A (Sovereign bonds)

(Science-Based Alignment Approach)

SB2A – Science-Based Alignment Approach is a Climate approach developed in 2017 and operated by Iceberg Data Lab. It uses the consumption based GHG footprint per capita for each country. The model calculates an ITR using Nationally Determined Contributions, which appraises the alignment of each issuer with its sectoral decarbonisation benchmark, based on IPCC RCP2.6.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; portfolio-level
Connection with other methods developed by the same organisation	**SB2A for corporates, real estate, and infrastructure** (see Iceberg Datalab SB2A dataset review in this appendix).
Output metric(s)	ITR (continuous, 0.5°C – 6.5°C)
Scenario(s) and pathway(s) used	IPCC RCP 2.6
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Have an ambition in line with IPCC RCP 2.6 scenario (per capita), converging to the required sector-level intensity by 2050 or have a current GHG intensity per capita already at net zero level.
What stage(s) of alignment does the output measure?	The ITR combines current and projected alignment, based on targets and/or historical extrapolation. Upon request only: 1. Assets that already operate at their net zero level (theoretically possible, non-existent in practice); 2. Assets that have an aligned target based on cumulative analysis; 3. Assets that are projected to respect their budget in the future, based on historical trends; 4. Assets that have respected their budget in the past, based on decarbonization benchmarks.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that are given the highest rating, especially the ones with the higher portfolio weight.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Public access (based on IPCC).
Applicability	
Asset class	Sovereign bonds.
Documentation & detailed method availability	SB2A Methodology, September 2021.
Coverage	160 countries
Sector coverage	All sectors, excluding LULUCF.
Methodology	
General	The general approach is similar for all assets/portfolios.

Main changes since the publication of the 2020 Alignment Cookbook	Not included in the Alignment Cookbook.
Scenario input data	• Uses scenario data to derive a decarbonization benchmark for each asset in portfolio and assess its (mis)alignment; • Uses IPCC RCP2.6 scenario: o Performs additional calculations: Growth rate of population, GDP per capita, Energy by GDP and CO_2 by energy. • Derives geography-specific (country) decarbonization benchmarks: o The benchmarks are derived by assuming that the GHG emissions per capita should converge to the same level in 2050 (intensity convergence principle).
Climate performance input data	• Uses GHG emissions per capita to measure climate performance: o Uses consumption-based emissions from the Global Carbon Budget dataset; o Uses disclosed emissions only: assets with no reported emissions are excluded. • Projects climate performance by using NDCs enforced into national law, excluding conditional pledges.
Alignment assessment	• Calculates the emissions cumulative over(under)shoot at asset-level between 2020 and 2100; • Applies a TCRE coefficient to convert the overshoot/undershoot to a temperature metric.
Additional analytical steps	No
Sector/portfolio-level aggregation	Aggregates the asset-level alignment assessment results: weighted average by investment value relative to portfolio value.
Planned updates	Future updates are planned to include 1.5 trajectory when available, updates of the reference trajectory according to the latest sources.

Impact Cubed

ITR

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset; portfolio-level
Connection with other methods developed by the same organisation	NR
Output metric(s)	• Asset-level temperature bucket (Temperature buckets: 1.5°C, 1.75°C, 2°C, 2.5°C, 3°C, 4°C); • Portfolio-level temperature (continuous, 1.5°C-4°C); • 50+ climate-related metrics can be found in the climate data package.
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	• Carbon emissions trend (Absolute carbon emissions); • Sector (Company's industry sector); • Carbon targets (SBTi-approved target). Maturity scale approach - heavy industries cannot get an ITR lower than 2.5°C; assets with increasing or constant absolute emissions since 2017 cannot get an ITR lower than 3°C.
Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data is used indirectly in two of the criteria: • The carbon target criteria rates the presence of SBTi-approved targets, themselves based on decarbonization scenarios; • The temperature rating threshold of assets with increasing/decreasing absolute carbon trend is based on an interpretation of IPCC RCPs trajectories.
Scenario(s) and pathway(s) used	Scenarios used in SBTi corporate target-setting protocols & IPCC RCPs.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	• 1.5°C aligned: Decreasing carbon trend, No heavy industry, Verified carbon target by SBTi (must equal 1.5°C); • 1.75°C aligned: Decreasing carbon trend, No heavy industry, Verified carbon target by SBTi (must be well below 2°C); • 2°C aligned: Decreasing carbon trend, No heavy industry, Verified carbon target by SBTi (equal to 2°C) or no target.
What stage(s) of alignment does the output measure?	It is possible to identify in the dataset: • Assets that have a validated SBTi target: Assets rated 1.5°C or 1.75°C necessarily have a validated SBTi target.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in companies that are given the maximum rating (especially companies with the highest portfolio weight).
Applicability	
Asset class	Equity and debt.
Documentation and detailed method availability	Climate Methodology, 2023
Coverage	40,000+ equity and debt.

Sector coverage	All macroeconomic sectors.
Methodology	
General	General approach similar for all assets/portfolios.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in the Alignment Cookbook.
Climate performance input data	• Classifies assets based on their industry (heavy industry, other). Heavy industry classification: ○ Energy: Oil and gas, Coal, Electric utilities; ○ Transportation: Air freight, Passenger air transportation, Maritime transportation, Rail transportation, Trucking services, Automobiles and components; ○ Materials and buildings: Metals and mining, Chemicals, Construction materials, Capital goods, Real estate management and development; ○ Agriculture, food and forest products: Beverages, Agriculture, Packaged food and meats, Paper and forest products. • Calculates carbon emissions trend (Absolute carbon emissions): ○ Calculates annual percentage changes in scope 1 and 2 GHG emissions for every year from the most recent year of data back over a 5-year period. The exponentially weighted average of annual percentage changes with a 1-year decaying period is taken to give more weight to recent emissions patterns; ○ For estimated data: employs a bottom-up analysis using the industry classification system (see above), which divides the economy into 2300 industry subsectors to categorise the products of every individual listed company. Every region-subsector (from in-house geographic revenue model) is analysed to identify the relevant industry averages. • Gathers SBTi-validated targets and the associated temperature level. Approved targets sourced from SBTi and assigned a value of 1. All remaining companies are assigned a value of 0.
Focus on the attributes rated using scenario data as an input	• The carbon target criteria rates the presence of SBTi-approved targets, themselves based on decarbonization scenarios; • The temperature rating threshold of assets with increasing/decreasing absolute carbon trend is based on an interpretation of IPCC RCPs trajectories.
Additional analytical step(s)	Categorises a company based on whether it has increasing or decreasing carbon emissions, is in a heavy-emitting industry and has set an SBTi-approved carbon reduction goal. Based on the categorisation, a company is assigned a score between 1.5°C and 4°C.

Sector/portfolio-level aggregation	Aggregates asset-level temperature score at portfolio-level using the weighted average of the portfolio's holdings' temperature scores.
Focus on how financial institutions are rated within the methodology	Use the same approach as for other assets – Financial institutions are not considered heavy industry. Require a validated SBTi and decreasing scope 1 and 2 emissions to be considered aligned.
Planned updates	

ISS ESG

Net Zero Alignment Status

To assess issuers preparedness for a net zero transition ISS ESG has developed a dedicated Net Zero dataset and analytics which helps investors understand the level of disclosure and target setting they can expect from an issuer today, allowing investors to identify which companies in their portfolios are unambitious or behind in terms of decarbonization.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Portfolio-level; Financial asset-level
Connection with other methods developed by the same organisation	Part of the wider net zero product offering which includes additional data points on green/brown exposure. A Business as usual and Net Zero trajectory is provided at the portfolio level and asset level for 2025, 2030 and 2050, showing how emissions would develop in a business-as-usual scenario compared to how they should develop in a Net Zero scenario (IEA Net Zero scenario). ISS ESG scenario alignment is currently available with scenarios aligned with well below 2°C, where issuers projected future emissions and climate targets are compared against scenarios trajectory to assess the issuer level of alignment with the Paris agreement goals. ISS ESG will release in 2024 a new version of its scenario alignment methodology, including the addition of 1.5°C scenarios which will complement the Net Zero solution tool further.
Output metric(s)	Alignment bucket (aligned, aligning, committed to aligning, not aligned). Aligned is not assigned to any asset in the covered universe. Criteria, and sub-criteria scores, are also available.
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	1. Material GHG disclosure: Is the company disclosing Material GHG emissions considering their sector? 2. 2050 NZ Target: Has the issuer declared a Net Zero target by 2050 or sooner and does the target include scope 1, 2, and relevant scope 3 emissions? 3. Interim Target: Has the issuer declared an intermediate Net Zero target and does that target include scope 1, 2, and relevant scope 3 emissions? 4. Decarbonization Strategy: Does the issuer have a decarbonization strategy in place, with a defined set of quantitative and qualitative actions to reach Net Zero Targets? Uses maturity scale as weighting approach.
Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data is not used directly.
Scenario(s) and pathway(s) used	NR

Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Asset are rated "aligning" if they are disclosing Material GHG emissions considering their sector; have declared a Net Zero target by 2050 or sooner that includes scope 1, 2, and relevant scope 3 emissions; have declared an intermediate Net Zero target that include scope 1, 2, and relevant scope 3 emissions; have a decarbonization strategy in place, with a defined set of quantitative and qualitative actions to reach Net Zero Targets. Assets are rated "committed to aligning" if they are disclosing Material GHG emissions considering their sector; have declared a Net Zero target by 2050 or sooner that includes scope 1, 2, and relevant scope 3 emissions.
What stage(s) of alignment does the output measure?	Companies with an aligned ambition can be identified when using the rating of the specific criteria.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in companies that are given the maximum rating (especially companies with the highest portfolio weight).
Applicability	
Asset class	Listed equity, corporate bonds and corporate loans.
Documentation and detailed method availability	• Net Zero Alignment Status; • Net Zero - report pages and dataset (2022); • Part of the wider net zero product offering.
Coverage	• 2,600 unique issuers; • 6,600 parent + parent to subsidiary amplification.
Sector coverage	39 high impact sectors: Integrated Oil & Gas, Oil & Gas Exploration & Production, Coal & Consumable Fuels, Commodity Chemicals, Diversified Chemicals, Fertilizers & Agricultural Chemicals, Industrial Gases, Specialty Chemicals, Construction Materials, Aluminium, Steel, Aerospace & Defence, Air Freight & Logistics, Airlines, Marine, Trucking, Highways & Rail tracks, Marine Ports & Services, Automobile Manufacturers, Electric Utilities, Gas Utilities, Multi-Utilities, Independent Power Producers & Energy Traders, Oil & Gas Drilling, Oil & Gas Equipment & Services, Oil & Gas Refining & Marketing, Oil & Gas Storage & Transportation, Railroads, Airport Services, Motorcycle Manufacturers, Water Utilities, Diversified Metals & Mining, Construction & Engineering, Electrical Components & Equipment, Heavy Electrical Equipment, Industrial Conglomerates, Construction Machinery & Heavy Trucks, Agricultural & Farm Machinery, Industrial Machinery.
Methodology	
General	Building blocks from various NZ frameworks, including NZAOA, NZIF, IIGCC and SBTi among others.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Climate performance input data	• Assesses the following criteria for each asset: o Material GHG disclosure: Is the company disclosing Material GHG emissions considering their sector? o 2050 NZ Target: Has the issuer declared a Net Zero target by 2050 or sooner and does the

	target include scope 1, 2, and relevant scope 3 emissions? o Interim Target: Has the issuer declared an intermediate Net Zero target and does that target include scope 1, 2, and relevant scope 3 emissions? o Decarbonization Strategy: Does the issuer have a decarbonization strategy in place, with a defined set of quantitative and qualitative actions to reach Net Zero Targets? • Those 4 main criteria are broken down further into more granular data points.
Focus on the attributes rated using scenario data as an input	Net zero ambition and interim targets criteria are evaluated based on qualitative criteria (GHGs scope, perimeter, time horizon) - no comparison with a decarbonization benchmark is done.
Additional analytical step(s)	• Classifies companies in alignment buckets based on the following maturity scale: o Asset are rated "aligning" if they are disclosing Material GHG emissions considering their sector; have declared a Net Zero target by 2050 or sooner that includes scope 1, 2, and relevant scope 3 emissions; have declared an intermediate Net Zero target that include scope 1, 2, and relevant scope 3 emissions; have a decarbonization strategy in place, with a defined set of quantitative and qualitative actions to reach Net Zero Targets; o Assets are rated "committed to aligning" if they are disclosing Material GHG emissions considering their sector; have declared a Net Zero target by 2050 or sooner that includes scope 1, 2, and relevant scope 3 emissions. No asset can be rated "aligned".
Sector/portfolio-level aggregation	Calculates the proportion of portfolio value per each level.
Focus on how financial institutions are rated within the methodology	Share of AUM in each alignment bucket per high impact sector.
Planned updates	In 2023, ISS ESG introduced additional data points to the Net Zero datasets to include some indicators around the climate governance of issuers and important elements to understanding the processes in place in terms of governance when it comes to treat climate related risks. In 2024, ISS ESG will expand Net Zero alignment assessment to low impact sectors, so it is expected that low impact sectors methodology will be introduced together with a coverage expansion. In 2025, ISS ESG will release its Net Zero 2.0 methodology which should include targets credibility assessment, and additional data points into the alignment assessments such as the presence of CAPEX disclosures for example.

Moody's

Temperature Alignment Data

Moody's Analytics' Temperature Alignment Data is a forward-looking assessment of the alignment of companies' decarbonization targets with carbon emissions trajectories. We compare company targets to decarbonization benchmarks derived from scenarios published by the International Energy Agency (IEA) and provide aggregate metrics as well as a range of underlying emissions data and projections.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Portfolio-level; Financial asset-level
Connection with other methods developed by the same organisation	Feeds into MIS Net Zero Assessments
Output metric(s)	ITR (continuous, 1.5°C to 3.1°C); Provides: • Temperature alignment levels (well below 2°C, below 2°C, 2°C, above 2°C); • Historical emissions; projected emissions (based on targets); target description.
Scenario(s) and pathway(s) used	IEA STEPS, SDS and NZE 2050.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Have its short- or medium-term targets aligned with its sector-specific/agnostic (depending on the sector) benchmark decarbonization rate.
What stage(s) of alignment does the output measure?	The methodology rates asset-level "ambition". Aligned performance and achievement of the net zero end state is not captured in the dataset.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that are given the highest rating, especially the ones with the higher portfolio weight or owned emissions.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access sector- and global level benchmark data.
Applicability	
Asset class	Listed equities & Corporate bonds
Documentation & detailed method availability	Moody's Temperature Alignment Data
Coverage	Paying dataset; circa 5 500 issuers
Sector coverage	All macroeconomic sectors, except finance, insurance and REITs.
Methodology	
General	• Includes two benchmark construction approaches depending on the sector (SDA vs non-SDA sector); • Builds on SBTi SDA for high-carbon & homogeneous sectors, SBTi Absolute contraction for other sectors.

Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Scenario input data	• Scenario data is used derive a decarbonization benchmark for the asset's target(s) and assess its (mis)alignment; • Uses IEA STEPS, SDS and NZE 2050, adds pathways from other scenario relating to other GHGs where relevant; • Uses different levels of granularity to derive the benchmark depending on the sector: 1. Sectors analysed with the SDA method (Airlines, Aluminium, Automobiles, Cement, Electric and Gas Utilities, Oil and Gas, Shipping and Steel): Sector-specific & geography-agnostic; 2. Sectors analysed with the absolute contraction method: Sector- & geography-agnostic. • Derives the benchmark using: o Uses the SDA approach for SDA sectors: The benchmarks are derived by assuming that emissions per unit of production should converge to the same level in 2050 (intensity convergence principle); o Uses the absolute contraction approach for other sectors: The benchmarks are derived by assuming that absolute emissions should decrease at the same rate.
Climate performance input data	Gathers disclosed corporate targets; • When targets only apply to a certain proportion of emissions, the remainder is kept at current-level; should not be based on offsets; • The methodology analyses both scope 1, 2 and 3 where relevant.
Alignment assessment	• Performs alignment assessment based on cumulative emissions (target baseline - target time horizon or 2030); • Computes ITR by interpolation (i.e. using multiple pathways corresponding to different temperatures); • Pure players (renewable energy, 100% electric cars vehicles targets in 2030) are assigned an automatic 1.5°C; • Companies with no targets are assigned an automatic 3.1°C.
Additional analytical steps	
Sector/portfolio-level aggregation	Aggregates asset-level alignment assessment results: weighted average by investment value relative to portfolio value (SBTi option 7, by outstanding value) or owned emissions (SBTi option 4 & 5).
Focus on how financial institutions are rated within the methodology	NR
Planned updates	Coverage of further sectors, universe expansion.

MSCI ESG Research

Corporate ITR

Implied Temperature Rise (ITR) is a forward-looking temperature alignment metric for companies and portfolios. Specifically, MSCI's ITR methodology evaluates if companies and portfolios are aligned with the Paris Agreement temperature goals — in particular, the maximal goal of limiting global mean surface temperature to an increase no more than 1.5°C in the year 2100 compared with preindustrial levels.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; Portfolio-level
Connection with other methods developed by the same organisation	Data from the targets & commitment dataset feeds into the MSCI corporate ITR.
Output metric(s)	• ITR (continuous, 1.3°C – 10°C); • Scope 1, 2 and 3 ITR; • ITR bands (strongly misaligned; misaligned; 2°C aligned; 1.5°C aligned); • Over/undershoot expressed in quantity of GHGs (absolute).
Scenario(s) and pathway(s) used	REMIND Net Zero 2050 NGFS scenario.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	1. Have decarbonization target(s) that are sufficient and credible to stay within the MSCI Research-derived country & sector-specific carbon budget; 2. Have a current emission intensity already at its "aligned" level as defined by MSCI Research-derived country & sector-specific carbon budget.
What stage(s) of alignment does the output measure?	It is possible to identify in the dataset: 1. Assets with an aligned target (with/without credibility assessment) using cumulative assessment; 2. Assets that have already reached their 2050 net zero level; 3. Assets with an aligned projected performance based on targets and/or constant growth assumption.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	The portfolio's assets aggregated GHGs emissions as projected should be within budget, as defined by the budget of its individual constituents.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access portfolio and asset-level benchmark data.
Applicability	
Asset class	Listed equity & corporate bonds, Real Estate & *Sovereigns (soon to be released*).
Documentation & detailed method availability	Implied Temperature Rise Methodology, MSCI ESG Research, Feb 2024.
Coverage	14,000+ issuers.
Sector coverage	All macroeconomic sectors.
Methodology	

General	General approach similar for all assets/portfolios.
Main changes since the publication of the 2020 Alignment Cookbook	New methodology.
Scenario input data	• Uses scenario data to derive a remaining carbon budget for each asset and portfolio, and assess its (mis)alignment; • The decarbonization intensity pathways are constructed for each emissions sector and country for all scopes using the REMIND NGFS Net Zero 2050 scenario. Builds benchmarks at two levels of aggregation (portfolio-level and asset-level): o Option 1: Portfolio (based on financial asset composition); o Option 2: Financial asset. • Derives the benchmarks using the fair share approach - the budget is allocated based on revenue in sector & geography: o NGFS-based CO_2 equivalent (CO_2e)/USD intensity pathways are assigned first to each Greenhouse Gas Protocol (GHGP) scope of a company; o Multiplying these pathways by a company revenue breakdown by sector and region yields an initial absolute carbon budget over the 2020-2050 time frame, tailored to the company's size and sectoral/regional profile; o Year after year, this initial budget is rolled over, that is, adjusted by subtracting the latest realized emissions (which spend the budget) and by market share.
Climate performance input data	• Uses absolute GHG emissions to measure climate performance; • Collects data on scope 1, 2, and 3 (full); • Uses estimated data where not disclosure (scope 1 & 2) and for all scope 3 data: custom estimation model (historical extrapolation, averages, LCA-based); • Projects climate performance data using decarbonization targets and credibility assessment: o Assesses the credibility of targets to adjust the projected decarbonization rate, taking into account the following criteria to produce a weighting: ▪ Whether the company has short-term targets on scope 1, scope 2 and scope 3; ▪ Whether the company's target alignment has been externally verified (/SBTi approved); ▪ Whether the company has a good track record in meeting past decarbonization targets; ▪ Whether the company is currently on track to meet its targets. • Where the asset has no target, uses constant emissions intensity per revenue (1% growth assumption per annum for revenue & absolute emissions).

Alignment assessment	• Performs the alignment assessment at: o Option 1: Asset-level; o Option 2: Portfolio-level; o Option 3: Fund-Level. based on cumulative emissions (2020-2050); • Uses TCRE to calculate the ITR, assuming the asset-level overshoot applies to all the economy.
Additional analytical steps	
Sector/portfolio-level aggregation	Aggregates the asset-level input data to perform alignment assessment at portfolio-level: ownership approach, financed emissions by EVIC and/or total equity + debt (unlisted companies).
Focus on how financial institutions are rated within the methodology	Same approach as for other sectors. Separate decarbonization benchmarks for loanbook, and assets under managements (AUM).
Planned updates	Launch of ITR V2 including ITR on private assets, sovereign, and real estate. The set of enhancements in the updated model strives to align with the recent best practice guidance on portfolio alignment by the Glasgow Financial Alliance for Net Zero.

Ortec Finance

ClimateALIGN Corporates

ClimateALIGN is Ortec Finance's Implied Temperature Rise (ITR) methodology. Aimed at public and private markets, it is powered by ESG Book's emissions data. The methodology is in line with the TCFD Portfolio Alignment Team's (PAT) recommendations and largely drawn from OS-Climate's portfolio alignment methodology.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Portfolio-level; financial asset-level
Connection with other methods developed by the same organisation	Ortec Finance also has a ClimateALIGN methodology for **sovereigns** and **real estate** (see ClimateALIGN Sovereigns & ClimateALIGN Real Estate methodologies review in this appendix).
Output metric(s)	ITR (continuous, 1°C to 9°C); Absolute company emissions; projected intensity emissions to 2050; ESG scores.
Scenario(s) and pathway(s) used	ClimateMAPS 2023 Net Zero by 2050 and High Warming scenarios.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Have SBTi validated targets and past emissions trend per unit of value-add converging to the required sector-region emissions intensity level in 2025, 2030 and 2050, as per the Ortec Finance MAPS 2023 Net Zero by 2050 scenario.
What stage(s) of alignment does the output measure?	It is possible to identify in the dataset: • Companies rated 1.5°C or less because they already reached the required emissions intensity; • Companies rated 1.5°C or less because they decarbonized at the right trend in the past (i.e. dissociating the 50% due to historical trends and 50% due to targets); • Companies rated 1.5°C or less because of their target only (i.e. dissociating the 50% due to historical trends and 50% due to targets).
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that have scores closest to 1.5°C, especially the ones with the higher portfolio weight.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access portfolio and asset-level benchmark data.
Applicability	
Asset class	Listed equities & Corporate bonds (private equity and company loans based on country – sector mapping).
Documentation & detailed method availability	ClimateALIGN Documents available on demand
Coverage	Paying dataset; 4,000+ issuers based on reported emissions data. In a future innovation, the coverage would increase to 10,000+ issuers when incorporating modelled emissions (not currently used).
Sector coverage	All sectors, either GICS level 1 or NACE 1- or 2-digit.

Methodology	
General	NR
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Scenario input data	• Uses scenario data to derive a decarbonization benchmark for the asset's projected emissions: o Uses ClimateMAPS 2023 Net Zero by 2050 and High Warming scenarios; o Builds sector and geography-specific benchmarks. • Derives economic intensity convergence benchmark. Hard-to-abate sectors should converge at a later date (more time to decarbonize), non-hard-to-abate sectors should converge sooner (less time to decarbonize).
Climate performance input data	• Utilizes ESG Book's database of reported data on scope 1, 2 and 3 (user can choose scope 1 & 2 only) for all GHGs emissions. Modelled data can also be utilized on client request; • Uses historical & projected emissions intensity; • Where no disclosure, projected scope 1, 2 and 3 emissions are estimated using ClimateMAPS High Warming scenario; • Uses company decarbonization targets, historical trend extrapolation, and ClimateMAPS High Warming scenario to project climate performance: o Uses all decarbonization target details (i.e. baseline, target time horizon, target rate…) to project future climate performance to be compared with decarbonization benchmark; o Uses validated SBTi targets only as default assumption. Possible to integrate all decarbonization targets on a bespoke basis.
Alignment assessment	• Assesses alignment for targets and projected emissions trends; • Performs alignment assessment based on cumulative approach (2020-2025; 2030; 2050); • The ITR is calculated by assuming the asset-level overshoot applies to all economy by applying a TCRE multiplier approach.
Additional analytical steps	Weight targets' alignment and projected emissions trend alignment equally to produce final ITR score.
Sector/portfolio-level aggregation	• Aggregates asset-level alignment assessment results: weighted average by investment value relative to portfolio value (SBTi option 7, by outstanding value) to ensure consistency in aggregation across asset classes; • Other aggregation methods such as EOTS can be deployed on client request.
Focus on how financial institutions are rated within the methodology	Same approach as for other sectors.
Planned updates	

Ortec Finance

ClimateALIGN Sovereigns

ClimateALIGN is Ortec Finance's Implied Temperature Rise (ITR) methodology. Focused specifically on sovereign debt, the analytics are built on country emissions data and countries' Nationally Determined Contributions (NDCs). The methodology draws from TCFD Portfolio Alignment Team's (PAT) recommendations and OS-Climate's corporate portfolio alignment methodology.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Portfolio-level; financial asset-level
Connection with other methods developed by the same organisation	Ortec Finance also has a ClimateALIGN methodology for **corporates** and **real estate** (see ClimateALIGN Corporates & ClimateALIGN Real Estate methodologies review in this appendix).
Output metric(s)	ITR (continuous, 1°C to 9°C).
Scenario(s) and pathway(s) used	ClimateMAPS 2023 Net Zero by 2050.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Have an NDC target and past emissions trend per capita/GDP in line with the country-specific budget between 2020 and 2025, 2030 and 2050, as per the Ortec Finance MAPS 2023 Net Zero by 2050 scenario.
What stage(s) of alignment does the output measure?	It is possible to identify in the dataset: • Countries that already have their emissions intensity per capita/GDP at the 2025/2030/2050 required level; • Countries that have decarbonized in the past at a trend compatible with the projected decarbonization benchmark; • Countries that have aligned NDCs.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that have scores closest to 1.5°C, especially the ones with the higher portfolio weight.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access portfolio and asset-level benchmark data.
Applicability	
Asset class	Sovereigns
Documentation & detailed method availability	ClimateALIGN Documents available on demand
Coverage	Paying dataset; 145 countries currently covered, across developed and emerging markets.
Sector coverage	All sectors, including AFOLU.
Methodology	
General	NR
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.

Scenario input data	• Uses scenario data to derive a decarbonization benchmark for the asset's projected emissions; • Uses country-specific benchmarks from ClimateMAPS 2023 Net Zero by 2050; • For countries that are explicitly modelled in the ClimateMAPS Net-Zero pathway, the Net-Zero country carbon budget is derived from the (benchmark) EIR trajectory up to 2050 based on the projected emissions and population in the Net-Zero pathway. For countries not explicitly modelled in the Net-Zero pathway, we use the required global decarbonization rate in combination with the initial country EIR to derive the benchmark EIR trajectory.
Climate performance input data	• Collect production-based emissions (territorial); • Uses NDCs including conditional pledges to project target climate performance and past climate performance to project trend climate performance (5-year trend extrapolation period); • Uses all NDC details (i.e. baseline, target time horizon, target rate…) to project future climate performance to be compared with decarbonization benchmark.
Alignment assessment	• Assesses trend emissions alignment vs benchmark and NDC emissions alignment vs benchmark; • Performs alignment assessment based on the cumulative approach (2020-2025; 2030; 2050); • The ITR is calculated by applying a TRCE multiplier approach assuming the asset-level overshoot applies to all countries.
Additional analytical steps	The user decides how to weight trend and NDC alignment.
Sector/portfolio-level aggregation	Aggregates asset-level alignment assessment results: weighted average by investment value relative to portfolio value (SBTi option 7, by outstanding value).
Focus on how financial institutions are rated within the methodology	NR
Planned updates	

Ortec Finance

ClimateALIGN Real Estate

ClimateALIGN is Ortec Finance's Implied Temperature Rise (ITR) methodology. Focused specifically on real estate, the analytics are built from property level using energy data, Measurabl's machine learning estimates, and CRREM tool. The methodology draws from TCFD Portfolio Alignment Team's (PAT) recommendations.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Portfolio-level; financial asset-level
Connection with other methods developed by the same organisation	Ortec Finance also has a ClimateALIGN methodology for **corporates** and **sovereigns** (see ClimateALIGN Corporates & ClimateALIGN Sovereigns methodologies review in this appendix).
Output metric(s)	ITR (continuous, 1°C to 9°C).
Scenario(s) and pathway(s) used	Uses **CRREM** scenario data (see CRREM methodology review in this appendix) and ClimateMAPS 2023 Net Zero by 2050 and High Warming scenarios.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Have projected emissions intensity per square meter below the required sub-sector/country-specific 2025, 2030 or 2050 level.
What stage(s) of alignment does the output measure?	It is possible to identify in the dataset: • Assets that already have their emissions intensity per unit of floor space at, or under, the 2025/2030/2050 required level; • Where retrofits are integrated (bespoke analysis), assets that have their projected emissions per unit of floor space at, or under, the 2025/2030/2050 required level.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that have scores closest to 1.5°C, especially the ones with the higher portfolio weight.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access asset-level benchmark data (in **CRREM**).
Applicability	
Asset class	Real estate
Documentation & detailed method availability	ClimateALIGN Documents available on demand
Coverage	Paying dataset; custom
Sector coverage	As **CRREM**: Health care; Hotel; Mixed use; Office; Retail - High street; Retail - Shopping center; Retail – Warehouse; Retail - Distribution warehouse; Industrial - Distribution warehouse; Lodging, Leisure & Recreation. EU, US/Canada and Asia Pacific.
Methodology	
General	Directly builds on **CRREM**.

Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Scenario input data	See **CRREM** (see CRREM methodology review in this appendix).
Climate performance input data	• See **CRREM;** • Uses Disclosure data, and estimated data in partnership with Measurabl; • Further assumptions on energy efficiency gains or retrofitting can be incorporated on a bespoke basis to project climate performance.
Alignment assessment	• Performs alignment assessment based on the cumulative approach (2020-2025; 2030; 2050); • The ITR is calculated by applying a TRCE multiplier approach assuming the asset-level overshoot applies to all economy.
Additional analytical steps	No
Sector/portfolio-level aggregation	Aggregates asset-level alignment assessment results: weighted average by investment value relative to portfolio value (SBTi option 7, by outstanding value).
Focus on how financial institutions are rated within the methodology	NR
Planned updates	

PACTA

Banks & Investors

The Paris Agreement Capital Transition Assessment (PACTA) is an open-source methodology and software to assess the alignment of financial portfolios with climate goals across a set of climate critical sectors and technologies. The assessment provides a five-year forward looking, bottom-up analysis, based on capacity and production values of physical assets in the real economy consolidated up to corporate entities.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Physical asset-level consolidated up to corporate entities; Aggregate sector-/technology-level (depending on the sector) providing portfolio level results.
Connection with other methods developed by the same organisation	The methodology is similar for Banks and Investors. See Influence Map, **My Fair Money** and **CA100+ Benchmark** which apply the PACTA methodology as input into their own assessments at portfolio or company level (See CA100+ Net Zero Benchmark methodology review in this appendix).
Output metric(s)	1. Technology/Fuel Mix (Automotive, Power, and Fossil Fuels) compared to technology pathways; 2. Production Volume Trajectory (Automotive, Power, and Fossil Fuels) compared to technology pathways; 3. Emissions Intensity: PACTA provides physical emission intensities compared to emissions pathways. The sectors for which this metric is provided depend on the tool; a. PACTA for Banks: Steel, Cement sector, Aviation; b. PACTA for Investors: Steel, Cement sector, Aviation Automotive, power and Fossil Fuels.
Scenario(s) and pathway(s) used	User-defined: IEA NZE 2050, IEA WEO 2022 APS, IEA WEO 2022 STEPS, IEA ETP SDS, JRC GECO 2022 Baseline, JRC GECO 2022 NDC LTS, JRC GECO 2022 1.5C Unif, ISF 2022 NZ.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	The 5-year forward-looking emissions intensity value or production value for the company or portfolio equals the 5-year value allocated from the scenario using one of the four allocation methods used.
What stage(s) of alignment does the output measure?	Measures aligned performance on a forward-looking basis based on revealed production plans and capital expenditures.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	The portfolio's assets aggregated technology exposure/emissions per unit of production, as revealed by their future plans, should evolve in line with required expansion and contraction levels as defined by the chosen scenario/pathways.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access technology-level “aligned” portfolio benchmark data but investors cannot access company or physical asset level data.
Applicability	
Asset class	• Banks: Loans (including credit facilities) to listed and unlisted companies - both general purposes and special purposes vehicles; • Investors: Listed equity, Corporate bonds and Funds.

Documentation & detailed method availability	• PACTA for Banks, Methodology Document (July, 2022) • PACTA for Investors, Methodology Document (November,2022)
Coverage	More than 390k physical assets, and more than 40k companies in the dataset.
Sector coverage	Seven sectors: Power, Fossil fuels (oil & gas, coal), Automotive, Steel and Cement, aviation.
Methodology	
General	Uses different approaches depending on the sector: • Technology exposure and production volume trajectory for Power, fossil fuels, automotive; • Emissions-based approach based on the SDA for all the analysed sectors in the PACTA for investor's tool. Steel, cement and aviation in the PACTA for Banks tool.
Main changes since the publication of the 2020 Alignment Cookbook	No major changes.
Scenario input data	• Uses scenario data to derive a decarbonization benchmark/technology benchmark for each asset in portfolio and assess its (mis)alignment; • Builds benchmarks at two levels of aggregation (technology-level or sector-level depending on the sector); o The user can choose the scenario: IEA NZE 2050, IEA WEO 2022 APS, IEA WEO 2022 STEPS, IEA ETP 2020 SDS, JRC GECO 2022 Current, JRC GECO 2022 NDC LTS, JRC GECO 2022 1.5C Unif, ISF 2020 NZ. • Builds the benchmark using four allocation approaches according to the metric and user: o Production Volume Trajectory: uses the fair market share approach to build a "technology exposure" budget that reflects the carbon budget evolution - the budget is allocated based on total production (both high-carbon and low-carbon) and then using distinct allocation methods for low-carbon technologies and high-carbon technologies; o Emission Intensity: Uses the Sector Decarbonisation (banks) or Absolute Contraction (investors) approach - The benchmarks are derived by assuming that the GHG emissions per unit of production should converge to the same level in 2050 (intensity convergence principle) or decline at a sector-wide linear rate.
Climate performance input data	• Assesses climate performance based on technology mix/exposure data, physical production and emissions intensity per unit of production: o Includes scope 1, 2, and 3 CO_2 emissions (where relevant). • Uses external databases: o Technology mix/exposure for oil & gas, auto and power, based on physical-assets dataset compiled from business intelligence providers.

	The forward-looking data points are based on announced capital investments and production plans; o Emissions intensities are calculated based on technology split taken from a physical-assets dataset compiled from business intelligence providers and then an emissions factor methodology is applied.
Alignment assessment	• Does not provide an alignment score, except in the external use cases of **My Fair Money** and **Climate Action 100+**; • The user can compare the current and projected climate performance relative to select pathways for each technology/sector; and understand the climate pathway the portfolio is attaining by reading the graphs; • The **CA100+ Net Zero Benchmark** uses a technology alignment aggregation approach across technologies for individual companies (See CA100+ Net Zero Benchmark methodology review in this appendix); • **My Fair Money** uses a combination of technology alignment aggregation and sector alignment aggregation to obtain a fund portfolio score.
Additional analytical steps	NR
Sector/portfolio-level aggregation	Aggregates the asset-level input data up to company level in order to perform alignment assessment at technology-level. Attribution of company alignment results is then made using an ownership or portfolio weight approach: • Banks: loan portfolio-weight or unweighted (simple sum) approach; • Investors: ownership weight or portfolio production weight approach. See InfluenceMap and **My Fair Money** for an example of portfolio-level aggregation across multiple sectors and technologies (See InfluenceMap methodology review in this
Focus on how financial institutions are rated within the methodology	Sector not in scope.
Planned updates	PACTA 2.0 is under development with planned releases in 2024.

Planetrics

Pathways temperature score

The Planetrics "Pathways" temperature score has been designed to provide a temperature alignment score for the full PlanetView universe of c. 25,000 listed companies globally. It takes into account scope 1 & 2 emissions directly and uses economic modelling to quantify the impact of downstream scope 3 emissions. This provides an integrated view of the company's climate impact without relying directly on scope 3 data. The "Pathways" temperature score can also take a company's climate targets into account.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; portfolio-level
Connection with other methods developed by the same organisation	Distributes an alternative ITR for corporate asset classes (see Planetrics Budget temperature score review in this appendix); ITR methodology for sovereigns (see Planetrics Sovereign review in this appendix).
Output metric(s)	ITR (continuous, 1.2°C to 4.8°C)
Scenario(s) and pathway(s) used	Company-specific warming based on sector-region pathways for multiple NGFS scenarios, each with an implied warming level (NGFSv3 REMIND (2022) scenarios: Current policies, NDCs, Below 2°C, Net Zero 2050).
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Companies should have their current emissions intensity per unit of revenue, or decarbonization target, at/leading to the required 2050 levels, as per NGFS scenario, and a positive climate impact from their downstream scope 3 emissions.
What stage(s) of alignment does the output measure?	It is possible to identify within the dataset: 1. Companies that have already reached their "aligned" 2050 emissions intensity; 2. Companies whose targets put them on track to reach their "aligned" 2050 emissions intensity.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that are given the highest rating, especially the ones with the higher portfolio weight.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	No
Applicability	
Asset class	Equities and Corporate bonds
Documentation & detailed method availability	Planetrics Temperature Alignment, Discussion document, July 2023 (non-public document).
Coverage	c. 25,000 issuers
Sector coverage	All industry sectors
Methodology	
General	General approach similar for all assets/portfolios.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.

Scenario input data	• Uses scenario data to derive a scope 1/2 decarbonization benchmark for each asset in portfolio and assess its alignment; • Combines trajectories taken from different NGFS scenarios to derive warming functions corresponding to different temperature levels; • Derives sector and geography (region)-specific benchmarks: o The benchmarks are derived by assuming that the GHG emissions per unit of revenue of assets operating in the same sectors-regions should converge to the same level in 2050 (economic intensity convergence principle). • Scenario inputs combined with economic modelling to calculate downstream scope 3 emissions impacts.
Climate performance input data	• Reported data on current scope 1 & 2 emissions intensity. (Estimated emissions data are used if reported data is not available); • Financial data on the company's current sector and product exposure based on its current revenue breakdown; • Company targets database enables firms' own climate targets to be incorporated into the temperature score (optional).
Alignment assessment	• Compares scope 1 & 2 current emissions intensity with what it needs to be under different scenarios in 2050, based on the economic intensity convergence allocation principle; • Calculates the scope 1 & 2 ITR score by interpolation (i.e. using multiple pathways corresponding to different temperatures); • Calculates the downstream scope 3 and avoided emissions score by modelling changes in the company's revenues under a climate transition scenario and rewarding companies whose revenues increase (including producers of low-carbon products or associated minerals and equipment) and penalising those whose revenues decrease (such as producers of high-carbon products).
Additional analytical steps	Aggregates the calculations for scope 1 & 2, and scope 3 and avoided emissions at asset-level; weighted based on the relative size of scope 1 & 2 impacts and scope 3 impacts absolute value impact of carbon costs (scope 1 and 2).
Sector/portfolio-level aggregation	Aggregates asset-level alignment assessment results using weighted averages: three options available.
Focus on how financial institutions are rated within the methodology	Same approach as for other sectors, based on scope 1 and 2 emissions.
Planned updates	

Planetrics

Budget temperature score

The Planetrics "Budget" temperature score has been designed to provide a temperature alignment score for the full PlanetView universe of c. 25,000 listed companies globally. It takes into account scope 1, 2 and 3 emissions directly. This provides an integrated view of the company's climate impact with a consistent method across all emissions scopes. The "Budget" temperature score can also take a company's climate targets into account.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; portfolio-level
Connection with other methods developed by the same organisation	Distributes an alternative ITR for corporate asset classes (see Planetrics Pathways temperature score review in this appendix) ITR methodology for sovereigns (see Planetrics Sovereign review in this appendix).
Output metric(s)	• ITR (continuous, 1.2°C to 4.8°C); • ITR is provided with and without targets (using current emissions intensity).
Scenario(s) and pathway(s) used	Sector-region emissions budgets in single NGFSv3 REMIND (2022) scenario (Below 2°C).
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Companies should have cumulative scope 1,2,3 emissions that "undershoot" the company's carbon budget, based on its sector and geography.
What stage(s) of alignment does the output measure?	It is possible to identify within the dataset: 1. Companies that have already reached their "aligned" 2050 emissions intensity; 2. Companies whose targets put them on track to reach their "aligned" 2050 emissions intensity.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	The sum of the cumulative over/undershoot of the companies in the portfolio (by ownership) vs the aligned benchmark (see scenario) should correspond to the temperature that is being aligned to.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	No
Applicability	
Asset class	Equities and Corporate bonds
Documentation & detailed method availability	Planetrics Temperature Alignment, Discussion document, July 2023 (non-public document).
Coverage	c. 25,000 issuers
Sector coverage	All industry sectors
Methodology	
General	General approach similar for all assets/portfolios.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.

Scenario input data	• Uses NGFS scenario data to derive a remaining carbon budget for each asset in portfolio and assess its (mis)alignment: o Uses a single scenario's (NGFS Below 2°C) warming. • Derives sector and geography (region)-specific benchmarks: o The benchmarks are based on the carbon budget available for companies in the sector-region between today and 2050 under the scenario.
Climate performance input data	• Reported data on current scope 1, 2 & 3 emissions intensity. (Estimated emissions data are used if reported data is not available); • Company targets database enables firms' own climate targets to be incorporated into the temperature score (optional).
Alignment assessment	• Compares the cumulative scope 1, 2 and 3 absolute emissions with what needs to be given the asset-specific budget between the base year and 2050; • Calculates the ITR score using the Transient Cumulative Response to CO_2 Emissions (TCRE), based on the extent to which the company overshoots or undershoots its budget.
Additional analytical steps	NR
Sector/portfolio-level aggregation	Aggregation of asset-level alignment data to perform alignment assessment at portfolio-level: financed emissions.
Focus on how financial institutions are rated within the methodology	Same approach as for other sectors, based on scope 1 and 2 emissions.
Planned updates	

Planetrics

Sovereign

The Planetrics sovereign temperature score has been designed to provide a temperature alignment score for sovereign bond issuers. It takes into account countries' current emissions and their planned emissions under their Nationally Determined Contributions (NDCs), along with NGFS scenarios, to calculate temperature scores. The temperature score can be based on absolute emissions or emissions per capita.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; Portfolio-level
Connection with other methods developed by the same organisation	Two ITR methodologies for corporates (see Planetrics Pathways temperature score & Planetrics Budget temperature score reviews in this appendix).
Output metric(s)	ITR (continuous, less than 1.5°C – greater than 3.5°C).
Scenario(s) and pathway(s) used	NGFS scenarios.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Have an ambition in line with NGFS scenario (absolute or per capita) in 2030.
What stage(s) of alignment does the output measure?	Is it possible to identify in dataset: 1. Assets who already have the required 2050 net zero level; 2. Assets that have an aligned ambition (because of targets); 3. Assets that have decarbonized at the right pace in the past.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that are given the highest rating, especially the ones with the higher portfolio weight.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Yes
Applicability	
Asset class	Sovereign bonds.
Documentation & detailed method availability	Planetrics Temperature Alignment, Discussion document, July 2023 (non-public document).
Coverage	23 countries.
Sector coverage	All sectors, including LULUCF.
Methodology	
General	General approach similar for all assets/portfolios.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Scenario input data	• Uses country-specific budget data as derived in scenario, as decarbonization budget for each asset in portfolio to assess its (mis)alignment;

	• Uses NGFS scenarios (below 2°C, current policies, divergent net zero, net zero 2050); • Expresses the budget in: o The "efficiency" approach is based on comparing the country's absolute emissions in its NDC trajectory with its emissions pathway under the NGFS scenarios; o The "equity" approach is based on measuring the deviation of per capita emissions implied in the country's NDC trajectory from the global per capita emissions implied in the NGFS scenarios.
Climate performance input data	• Collects reported data on territorial emissions including Land Use and Land use Change from third party data sources; • Projects climate performance data using NDCs, excluding conditional pledges, from UNFCCC NDC Registry.
Alignment assessment	• Compares projected 2030 emissions (absolute, per capita) with what it needs to be under different NGFS scenarios in 2030; • Calculates the ITR score by interpolation (i.e. using multiple pathways corresponding to different temperatures).
Additional analytical steps	NR
Sector/portfolio-level aggregation	Aggregates the asset-level alignment assessment results: weighted average by investment value relative to portfolio value.
Planned updates	

S&P Global

Sustainable1 Paris Alignment Assessment

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; Portfolio-level
Connection with other methods developed by the same organisation	
Output metric(s)	• ITR scores (Categorical, <1.5°C, 1.5-2°C, 2-3°C,3-4°C,4-5°C and >5°C); • % over(undershoot) and absolute emissions; • % over(under) carbon gap per mn invested; • Intensities for each year and each company per unit of production or value add.
Scenario(s) and pathway(s) used	Use IEA NZ2050 and IEA ETP for homogeneous sectors; IPCC SSPs for heterogeneous sectors.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Companies whose forecasted rate of decarbonization per unit of production (based on asset-level data, targets, and extrapolation) is in line with its company-specific benchmark, converging to the required sector-level intensity by 2050 or companies whose emissions per unit of value-added decrease at the same rate as the relevant SSP scenario year-on-year (depends on the sector).
What stage(s) of alignment does the output measure?	It is possible to identify within the dataset: 1. Assets that have an aligned target based on cumulative analysis; 2. Assets that have an aligned past and projected performance based on cumulative analysis. Past and projected performance alignment can be dissociated by the user.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	The sum of the cumulative over/undershoot of the companies in the portfolio (by ownership) vs the aligned benchmark (see scenario) should be 0 (or realistically, negative).
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access portfolio and asset-level benchmark data.
Applicability	
Asset class	Listed equity, corporate bonds and corporate loans.
Documentation & detailed method availability	Portfolio Paris Alignment Assessment Methodology (2022).
Coverage	17,000+ companies.
Sector coverage	All macroeconomic sectors.
Methodology	
General	Uses two approaches depending on the sector (heterogeneous/homogeneous): • SDA for homogeneous sectors; • GEVA for other sectors.

Main changes since the publication of the 2020 Alignment Cookbook	Longer time horizon, updated scenarios, inclusion of estimated data.
Scenario input data	• Uses scenario data to derive a decarbonization benchmark for the asset/portfolio under consideration and assess its (mis)alignment; • Builds benchmarks at two levels of aggregation (portfolio-level and asset-level) and for each temperature outcome (<1.5°C, 1.5-2°C, 2-3°C,3-4°C,4-5°C and >5°C): o Uses IEA ETP, IEA NZ2050 and IPCC SSP. • Uses a different approach for homogeneous (Electric Utilities; Steel; Aluminum; Cement; Airlines, Automobile Manufacturers) and heterogeneous sectors (all others): o Uses the SDA approach for homogeneous sectors: The benchmarks are derived by assuming that emissions per unit of production should converge to the same level as the IEA scenario requirement in 2050 (intensity convergence principle); o Uses the GEVA approach for other sectors: The benchmarks are derived by assuming that emissions per unit of value add should decrease at the same rate over time as relevant SSP (economic intensity contraction).
Climate performance input data	• Uses GHG emissions per unit of production/value add to measure climate performance: o Includes S1 & 2 emissions only; o Includes S3 use of sold products emissions for the automotive sector (also plan to release additional O&G supplement). • Uses disclosed or estimated emissions for a minimum 5-year historical period, and forecast period through 2030; • Estimates the future climate performance of each company based on specific data hierarchy: o Disclosed emissions reduction targets; o If not, asset-level data based on datasets such as, S&P World Electric Power Plants; o It not, company-specific historical emissions trends for companies with homogeneous activities; o GICS sub-industry average historical emissions trends for companies with heterogeneous activities; o No change in emissions intensity.
Alignment assessment	• Performs alignment assessment at issuer-level and at portfolio-level; • Calculates the cumulated overshoot/undershoot of carbon emissions relative to the different temperature benchmarks (currently between 2012 and 2030, time horizon revised periodically to as forward-looking data availability evolves); • Calculates the ITR score by interpolation (i.e. using multiple pathways corresponding to different temperatures).
Additional analytical steps	NR

Sector/portfolio-level aggregation	Aggregates the asset-level input data to perform alignment assessment at portfolio-level: ownership approach, financed emissions (by MV or EV or EVIC).
Focus on how financial institutions are rated within the methodology	Materially all listed large, medium and small cap FIs independent of GICS industry are covered, using the GEVA approach (contraction of emissions per unit of value added based on global pathway).
Planned updates	

Sustainable Platform

Funds Alignment with Climate Scenarios

Sustainable Platform (SP) provides the level of alignment of investments with climate change scenarios using its proprietary analysis of fossil fuel exposure data for companies and the Bank of England Stress Test (BoE) scenarios. By comparing the current investment exposure to fossil fuels vs the 2050 levels, Sustainable Platform measures the alignment of portfolios to 1.5°C, 2°C, >2°C to 4°C and >4°C temperature increases above pre-industrial levels.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Fossil fuel level; portfolio-level (aggregated across fossil fuels)
Connection with other methods developed by the same organisation	
Output metric(s)	• Paris Agreement Alignment for each fossil fuel and overall (categorical: 1.5°C, 2°C, 2-4°C, >4°C); • Products and services revenue and cost data with associated carbon emissions.
Scenario(s) and pathway(s) used	NGFS 1.5°C, 2°C, 2-4°C, >4°C scenarios (2020 baseline).
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	The assets aggregated exposure to fossil fuel should be equal to its 1.5°C or 2°C benchmark exposure in 2050.
What stage(s) of alignment does the output measure?	The dataset can be used to identify: assets that have current fossil fuel exposure near, or at, their required 2050 net zero level.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	The portfolio's assets aggregated exposure to fossil fuel should be equal to its 1.5°C or 2°C benchmark exposure in 2050.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access fossil fuel-level "aligned" benchmark data.
Applicability	
Asset class	Listed equity, private companies, corporate bonds.
Documentation & detailed method availability	Available on demand
Coverage	30 000+ issuers
Sector coverage	All macroeconomic sectors.
Methodology	
General	General approach similar for all assets/portfolio.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Scenario input data	• Uses scenario data to derive a fossil fuel exposure benchmark for the portfolio and assess its (mis)alignment; • Builds benchmarks disaggregated per fossil fuels and aggregated (thermal coal, oil, gas, other fossil fuels):

	○ Uses NGFS 1.5°C, 2°C, 2-4°C, >4°C scenarios (2020 baseline). • Builds the benchmarks based on the absolute contraction principle: all portfolios need to decrease their exposure to fossil fuels based on the rate as derived in NGFS scenarios.
Climate performance input data	• Uses asset-level products and services revenue and costs in thermal coal, oil, gas and other fossil fuels to measure climate performance: ○ Includes in the scope: Current sales of fossil fuels, use of fossil fuels in operations, fossil fuel exposure through electricity and other purchases. • Uses only disclosed data (from the Bank of England Stress Test database).
Alignment assessment	• Performs alignment assessment at portfolio-level, by comparing the current portfolio exposure to fossil fuels and what it needs to be under different NGFS scenarios in 2050; • Attributes an ITR band using interpolation.
Additional analytical steps	NR
Sector/portfolio-level aggregation	• Assesses alignment at fossil fuel level; • Aggregates asset-level input data to perform alignment assessment at portfolio-level: financed fossil fuels, by fossil fuel types, using EV or EVIC.
Focus on how financial institutions are rated within the methodology	FIs are evaluated as any other assets.
Planned updates	Asset owner carbon emissions results and benchmarking.

Asset-level (only) alignment assessment:

Assessment of alignment at the level of a financial asset only, without suggesting an approach to aggregate the results at portfolio-level.

ACT Corporates

Overarching methodology

ACT is a progress assessment framework (methodologies and tool) for companies. It was founded in 2015 by ADEME, the French Agency for Ecological Transition, and CDP with funding from the French government and the European Union. It is a joint voluntary initiative of the UNFCCC secretariat Global Climate Agenda. Its objective is to drive action by companies and put them on a well below 2 °C compatible pathway. As of 2023, 15 high emissive sectors are covered and in 2023, an ACT Finance methodology was launched, dedicated to the assessment of financial institutions.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level
Connection with other methods developed by the same organisation	Multiple sector-level frameworks as well as a generic framework for sectors not covered; ACT Adaptation in development.
Output metric(s)	Performance score as a number from 0 (lowest) to 20 (highest): measures the degree of alignment with the requirements of a low-carbon economy; Narrative score as a letter from E (lowest) to A (highest): summarises the full conclusions of the analysis, including performance score results and narrative indicators; Trend score as either "+" for improving, "-" for worsening, or "=" for stable: aims to forecast changes in the company's alignment with the low-carbon transition by answering the following question: "will the company's ACT score improve, worsen or stay the same if repeated in the near future?".
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	Module 1* - Targets Module 2* - Material investment Module 3 - Intangible investment Module 4 - Sold Product Performance Module 5 - Management Module 6 - Suppliers engagement Module 7 - Client engagement Module 8 - Policy engagement Module 9 - Business Model Weighting assigned at module level and at indicator level - varies depending on the sector.
Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data is used to: • Module 1: To derive a decarbonization benchmark for the asset's target under consideration and assess its (mis)alignment (= "commitment gap");

	• Module 2: To derive a decarbonization benchmark for the asset's past, projected and locked-in emissions and assess its (mis)alignment (= "commitment gap").
Scenario(s) and pathway(s) used	Uses a range of different 2°C scenarios and pathways - IEA NZE when available and Well below 2°C on the other.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Commitment: The company has science-based targets for its activity and for all emissions. The targets have a consistent time horizon with the lifetime of assets; Transition Plan: The company's strategic planning details the investments and shifts towards a low-carbon food value chain. Actions to incentivize dietary changes are included; Present: Current share of products and plans are shifting to low-carbon products; Legacy: The trend is evident of lowering emissions intensity along all the value chain. The company has already implemented actions over the last 5 years to lower its emissions; Consistency: The company's targets, transition plan, present actions and past legacy show a consistent willingness to achieve the goals of low-carbon transition.
What stage(s) of alignment does the output measure?	Companies with an aligned ambition and aligned performance can be identified when using the rating of the specific indicator/module.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Asset-level methodology - No aggregation
Applicability	
Asset class	Corporate
Documentation and detailed method availability	ACT Framework, version 1.1, march 2019
Coverage	The World Benchmarking Alliance distributes datasets: Oil & Gas Benchmark, Buildings Benchmark, Transport Benchmark, Automotive Benchmark, Electric Utilities Benchmark. 450 companies.
Sector coverage	Existing sector-specific ACT methodologies: Auto, Building Construction, Real Estate, Property Development, Retail, Electric Utilities, Oil & Gas, Transport, Cement, Financial institutions, Iron & steel, Aluminium, Pulp & paper, Glass, Agriculture and Agri-food (draft), Chemicals (draft). ACT Generic methodology for all sectors not covered by other ACT methodologies (existing or future).
Methodology	
General	Sector-specific ACT methodologies.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in the Alignment Cookbook.
Climate performance input data	Uses voluntary data provision by companies as well as external data sources for each indicator within each module.

Focus on the attributes rated using scenario data as an input	Module 1 - Targets: • Assesses scope 1, 2 and/or 3 targets where relevant; • Uses scenario-based data to assess decarbonization target's alignment; • Uses all target details (i.e. baseline, target time horizon, target rate…); • Applies the sectoral decarbonization approach where possible to derive the benchmark. If not, uses the absolute contraction approach; • Compares the trend embedded within the disclosed targets with the trend required as per the benchmark; • Assesses in additional indicators whether the target's time horizon is adequate relative to the asset base lifetime and whether the asset has achieved its targets in the past. Module 2 - Material investments: • Alignment-based analysis in 3 indicators: Indicator 1: Trend in past emissions; Indicator 2: Trend in future emissions; Indicator 4: Locked-in emissions; • Collect reported data on scope 1, 2, and 3 GHGs emissions; assets; • Applies the sectoral decarbonization approach where possible to derive the benchmark. If not, uses the absolute contraction approach; • Past and future emissions alignment: performs alignment assessment based on a trend over a 5-year period; • Locked-in emissions: performs alignment assessment based on a cumulative comparison over 15 years.
Additional analytical step(s)	NR
Sector/portfolio-level aggregation	NR
Focus on how financial institutions are rated within the methodology	See ACT Finance in this appendix.
Planned updates	

Climate Action 100+

Net Zero Company Benchmark

The Climate Action 100+ Net Zero Company Benchmark assesses the performance of focused companies against the initiative's three high-level goals: emissions reduction, governance, and disclosure on and implementation of net zero transition plans. Four sets of company assessments against the Benchmark have been released since March 2021.

The Benchmark is not a disclosure mechanism or database itself. Rather, it is an evaluation tool for investor engagement that can be used by investors, all of whom will have differing mandates and starting points together with considerations of jurisdiction, regulation, and best practice, from which they make their own decisions. Investors always act independently, including with respect to investment decisions and voting.

Use case & interpretation	
Primary objective	Disclosure & Alignment assessments
Level	Financial asset-level
Connection with other methods developed by the same organisation	NR See linkages with other methodologies below: all the alignment assessments and methodologies are developed, owned and provided by the **Transition Pathway Initiative** (TPI) (See TPI methodology review in this appendix) and **FTSE Russell** (See FTSE Russel methodology review in this appendix), **Rocky Mountain Institute RMI** (formerly 2 degrees) (See PACTA methodology review in this appendix), **Carbon Tracker Initiative** (CTI) and **InfluenceMap** (See InfluenceMap methodology review in this appendix), in collaboration with the CA100+.
Output metric(s)	• No single aggregated metric at asset-level; • Criteria & sub-criteria level scores.
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	1. Net zero GHG Emissions by 2050 (or sooner) ambition; 2. Long-term (2036-2050) GHG reduction target(s)* – includes targets' alignment assessment using the **TPI Carbon Management** module; 3. Medium-term (2026-2035) GHG reduction target(s)* – includes targets' alignment assessment using the **TPI Carbon Management** module; 4. Short-term (up to 2025) GHG reduction target(s) – includes targets' alignment assessment using the **TPI Carbon Management** module*; 5. Decarbonisation strategy (target delivery); 6. Capital alignment* – includes CAPEX alignment assessment using **RMI** and **Carbon Tracker Initiative** analysis; 7. Climate policy engagement – includes **InfluenceMap** climate policy assessment; 8. Climate governance; 9. Just transition (beta); 10. TCFD disclosure - includes **Carbon Tracker Initiative** climate accounting and audit assessment; 11. Historical Emissions. No weighting (no aggregated score at asset-level).

Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data is used to: • Targets: derive a decarbonization benchmark for the target(s) under consideration and assess its (mis)alignment; • Capital alignment criteria: To derive a technology exposure benchmark for the asset under consideration and assess its (mis)alignment; to derive criteria to assess retirement schedules' (mis)alignment. Scenario data is also used indirectly in: • Transition plan evaluation: Evaluate the quality of company transition planning; • Climate Lobbying Criteria: Understanding company lobbying activities alignment with Net Zero; • Climate Accounting and Audit Criteria: Evaluate financial statements.
Scenario(s) and pathway(s) used	• Target(s) alignment - Applies **TPI methodology** which uses multiple scenarios depending on the sector, including NZE 2050, IEA ETP, and custom scenarios; • Capital alignment - Applies **PACTA** and **CTI methodology** using: o Electric utilities and autos: IEA's Net Zero by 2050 (NZE), Announced Pledges Scenario (APS) and the Stated Policies (STEPS) scenarios; o Aviation: Beyond 2°C (B2DS) scenario; o Steel and cement: Net Zero by 2050 (NZE) scenario.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	No aggregated score at asset-level.
What stage(s) of alignment does the output measure?	• Assets with a 1.5°C aligned targets and/or current performance can be identified (but not differentiated); • Assets with aligned CAPEX can be identified.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	No aggregation methodology at portfolio-level.
Applicability	
Asset class	Corporate asset classes.
Documentation and detailed method availability	Net Zero Company Benchmark (latest version in 2023)
Coverage	171 companies as of September 2023.
Sector coverage	15 sectors: Airlines, autos, cement, chemicals, coal mining, consumer goods and services, diversified mining, electric utilities, oil & gas, oil & gas distribution, other industrials, other transport, paper, shipping, steel.
Methodology	
General	All of the assessments and methodologies are provided by the **Transition Pathway Initiative** (TPI) (See TPI methodology review in this appendix) and **FTSE Russell** (See FTSE Russel methodology review in this appendix), **Rocky Mountain Institute RMI** (formerly 2 degrees) (See PACTA methodology review in this appendix),

	Carbon Tracker Initiative (CTI) and **InfluenceMap** (See InfluenceMap methodology review in this appendix), in collaboration with the **CA100+**.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Climate performance input data Criteria with an * directly integrate scenario-based alignment performance assessment	Assesses the following criteria: 1. Net zero GHG Emissions by 2050 (or sooner) ambition; 2. Long-term (2036-2050) GHG reduction target(s)*; 3. Medium-term (2026-2035) GHG reduction target(s)*; 4. Short-term (up to 2025) GHG reduction target(s)*; 5. Decarbonisation strategy (target delivery); 6. Capital alignment*; 7. Climate policy engagement; 8. Climate governance; 9. Just transition (beta); 10. TCFD disclosure; 11. Historical Emissions. Criteria 2, 3, 4 and 6 comprise a mathematical evaluation of the asset's climate performance compatibility with a scenario-based element (see deep-dive below), using **TPI Carbon performance Score** (See TPI methodology review in this appendix); **RMI** (formerly 2 degrees) (See PACTA methodology review in this appendix) capital allocation alignment; and **Carbon Tracker Initiative** Capital Allocation Alignment.
Focus on the attributes rated using scenario data as an input	• Targets' alignment (criteria 2, 3, and 4): o See **TPI Carbon Performance score** (See TPI methodology review in this appendix); TPI results directly used for all sectors where available; o Assesses other qualitative criteria relative to targets such as coverage. • Capital alignment based on **PACTA** (See PACTA methodology review in this appendix) (complementing criteria 6): o Applies **PACTA** for Utilities, autos, steel, cement, aviation; o Uses the following scenarios: ▪ Electric utilities and autos: IEA's Net Zero by 2050 (NZE), Announced Pledges Scenario (APS) and the Stated Policies (STEPS) scenarios; ▪ Aviation: Beyond 2°C (B2DS) scenario; ▪ Steel and cement: Net Zero by 2050 (NZE) scenario. o Derives company-level alignment outcome based on point-in-time alignment assessment for utilities and autos (T+5) and steel, cement, and aviation (2030): ▪ Utilities and autos: Assessment at technology- level, aggregated at asset-level across technologies to produce a Green/Amber/Red rating. Aggregation based on the company's projected capacity per technology in 2026 and the

	extent to which its production must change between 2022 and 2026 in the NZE; ▪ Steel, cement, and aviation: Assigns an alignment bucket based on the distance to scenario (Significant distance to alignment with the scenario; moderate distance; Aligned or close to being aligned with the scenario). o New asset level decarbonisation indicators in 2023 designed to diagnose whether changes are virtual or real, i.e. whether emissions and/or technology exposure as decreased/increased because of physical asset's closure/opening or solely reselling. • Capital alignment based on CTI (complementing criteria 6): o Applies CTI analysis for Oil & Gas and electric utilities sectors; o Oil & Gas: ▪ Uses physical asset-level production and economic data, as given by third-party datasets (e.g. Rystad Energy); ▪ Orders all physical assets based on break-even cost; derives maximum cumulative production under various scenarios (IEA's latest scenarios including NZE, APS and STEPS); ▪ Computes four indicators based on the above: • Consistency of recent year CAPEX projects (made up of 1 or more assets) with the chosen scenario; • Percentage of the company's potential future unsanctioned oil and gas CAPEX inconsistent with the chosen scenario; • Impairment price assessment; • Required decline of the company's oil & gas production level to 2030s (against 2021 baseline). o Utilities: ▪ Uses IEA APS, STEPS and NZE scenarios to derive criteria to assess retirement schedules' (mis)alignment; ▪ Assesses: • Coal fired generation fleet phase out announcement & consistent with CTI's interpretation of a Paris-aligned pathway (NZE); • Unabated gas fired generation fleet phase out announcement & consistent with CTI's

	interpretation of a Paris-aligned pathway (NZE); • % of the company's operating and planned unabated coal and gas capacity is consistency with the Paris Agreement goals.
Additional analytical step(s)	NR
Sector/portfolio-level aggregation	NR
Focus on how financial institutions are rated within the methodology	NR
Planned updates	

CRREM

(Carbon Risk Real Estate Monitor)

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level
Connection with other methods developed by the same organisation	No
Output metric(s)	• Year of stranding (year in which emissions per floor area/energy intensity exceed the benchmark); • Excess emissions after year of stranding; • Development of the share of stranded assets, or assets over 1.5°C benchmarks to 2050, within the portfolio.
Scenario(s) and pathway(s) used	1.5°C scenarios (in CRREM tool). Remaining carbon budgets derived from the IEA Net-Zero NZE: Global building sector CO_2 emissions and UNFCCC GHG Inventory, US United States Environmental Protection Agency & Kigali Amendment to the Montreal Protocol: Global building sector CO_2e emissions, downscaled at sub-sector level & country-level. Derived decarbonization pathways converted to energy intensity pathways.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	A 1.5°C aligned property does not exceed both CRREM pathways at any point in time to 2050 – emissions and kWh.
What stage(s) of alignment does the output measure?	It is possible to identify within the dataset: 1. Assets who already have the required 2050 net zero level; 2. Assets that have an aligned performance (if the user includes retrofits or other climate performance projected data).
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Be invested in assets that do not exceed both CRREM pathways at any point-in-time to 2050 – emissions and Kwh.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access sub-sector and country-level pathways data.
Applicability	
Asset class	Real estate
Documentation & detailed method availability	Multiple methodology document
Coverage	NR
Sector coverage	Health care; Hotel; Mixed use; Office; Retail - High street; Retail - Shopping center; Retail – Warehouse; Retail - Distribution

	warehouse; Industrial - Distribution warehouse (warm and cold); Lodging, Leisure & Recreation. EU, US/Canada and Asia Pacific.
Methodology	
General	May use GRESB data as input. Applies the SDA approach, aligned with The SBTi and the IEA Net Zero by 2050 Pathways for the buildings and energy sector.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Scenario input data	• Uses scenario data as an input to derive decarbonization/energy intensity benchmarks for the asset's current and projected climate performance and assess its (mis)alignment; • Uses remaining carbon budgets derived from the IEA Net-Zero NZE: Global building sector CO_2 emissions and UNFCCC GHG Inventory, US United States Environmental Protection Agency & Kigali Amendment to the Montreal Protocol: Global building sector CO_2e emissions, downscaled at country- and sub-sector-level: o Uses the physical intensity convergence principle to derive country- and sub-sector pathways (SDA). No benchmarks derived at asset-level; o Converts decarbonization pathways to energy intensity pathways.
Climate performance input data	• Uses emissions per unit of floor space; • Includes all GHGs; • Includes energy consumption; refrigerant loss; • Runs on data collected by user; • Users can input the impact of retrofit on projected emissions and energy intensity.
Alignment assessment	Derives the year where the assets' emissions intensity and energy intensity exceed country- and sub-sector benchmark.
Additional analytical steps	Derives excess emissions between the year of stranding to 2050 i.e. the quantity of emissions over the decarbonization benchmark over the time period when the asset's emissions intensity is higher than that of its benchmark.
Sector/portfolio-level aggregation	• Shows the development of the share of stranded assets, or assets over their 1.5°C benchmarks to 2050, within the portfolio; • Aggregates asset-level alignment assessment results: weighted average by investment value relative to portfolio value (SBTi option 7, by outstanding value).
Focus on how financial institutions are rated within the methodology	NR
Planned updates	

FTSE Russell

CLAIM-based Sovereign Temperature scores (Net zero target, NDC and current scenario)

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level
Connection with other methods developed by the same organisation	The metrics are based on Beyond Ratings CLAIM model, which is also used to derive company-level ITR (see FTSE Russel Implied Temperature Rise scores review in this appendix). FTSE Russell also sources the information and calculates the TPI Management Quality Score.
Output metric(s)	Three outputs (range 1.2°C and 8°C): 1. Net zero commitment ITR; 2. NDC ITR; 3. Current policies ITR. Other outputs include: • Required annual reduction of total territorial GHG emissions including LULUCF in order to reach 2°C-compliant territorial GHG budgets in 2050 (%); • Gap between the 5-year historical trend of total territorial GHG emissions including LULUCF and the required annual reduction of these emissions to reach 2°C-compliant territorial GHG budgets in 2050 (based on CAGRs).
Scenario(s) and pathway(s) used	CLAIM-based scenarios developed by Beyond ratings.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Depends on the output: 1. Have a net zero commitment that is sufficient to stay within the CLAIM-derived emissions budget in 2050; 2. Have an NDC that is sufficient to stay within the CLAIM-derived emissions budget in 2030; 3. Have current policies that that is sufficient to stay within the CLAIM-derived emissions budget in 2030.
What stage(s) of alignment does the output measure?	It is possible to identify within the dataset: 1. Assets who already have reached their 2030/2050 net zero levels; 2. Assets that have an aligned net zero commitment and target (metric 1 and/or 2) based on point-in-time analysis; 3. Assets whose projected performance is aligned (metric 3) based on point-in-time analysis.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	NR
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	No

Applicability	
Asset class	Sovereigns
Documentation & detailed method availability	The COP27 Net Zero Atlas; National Carbon Reduction Commitments: Identifying the Most Consensual Burden Sharing (2018).
Coverage	Free dataset: 1. 87 countries that have already set net zero commitments; 2. 132 countries have submitted a quantifiable NDC; 3. G20 countries for current policies.
Sector coverage	All sectors, including LULUCF.
Methodology	
General	General approach similar for all assets.
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Scenario input data	• Uses scenario data to derive a decarbonization budget for each asset in portfolio and assess its (mis)alignment; • Uses the CLAIM model, developed by Beyond Ratings: o Assigns the percentage shares of the global annual carbon budget in 2030 and 2045/2050/2060/2070 to individual countries, based on the CLAIM model; o This "share of the burden" calculation, based on a proprietary model, uses a statistical approach to simulate millions of possible "country shares" according to their climate and economic profile (historical emissions, energy intensity, GDP/capita, etc.); o The model provides likely carbon budget allocations, consistent with a 2°C scenario, whose global budget comes from the MESSAGEGLOBIOM model used in the assessment reports of the IPCC; o Likely carbon budgets have a priori the highest probability of emerging from international discussions, whatever being the criteria on which the latter might be based (historical responsibility, capacity, ect.).
Climate performance input data	• Use current territorial emissions profiles, including Land Use and Land use Change, using several datasets: IIASA based on UNFCCC and FAO reported emissions; Primap-hist database of the Potsdam Institute; • Gathers data to produce the three sets of results produced based on: 1. Net Zero ambition; 2. NDCs; 3. Current policies; o "Current policies" emissions trajectories are constructed by the NewClimate Institute and IIASA that provide annual emissions estimates from 2021 to 2030.

Alignment assessment	• Quantifies the GHG emissions overshoot/undershoot in 2030 (NDC & current policies) and 2050 (Net zero ambition) compared to the allocated budget; • Applies a TCRE coefficient to convert the overshoot/undershoot to a temperature metric.
Additional analytical steps	NR
Sector/portfolio-level aggregation	Aggregates asset-level alignment assessment results: weighted average by asset-level total emissions relative to portfolio-level total emissions.
Planned updates	June 2024 the sooner.

Germanwatch & NewClimate Institute – CCPI

(Climate Change Performance Index)

The CCPI assesses countries' climate performance across four key categories and 14 indicators. It incorporates fairness considerations through following the CDC approach, allowing emerging markets to initially increase GHG emissions and energy use. It also evaluates the Well-Below-2°C compatibility of both current status and pledged 2030 targets for GHG, renewable energy, and energy use. With input from over 450 domestic experts who evaluate the implementation and rigor of national and international climate policies, the CCPI offers reliable annual updates on policy progress.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level
Connection with other methods developed by the same organisation	No
Output metric(s)	• Scores ranges: 0-100 (worst – best performance) for overall assessment and categories. Indicators are measured in a 0-1 score range; • Ranks for overall assessment, for categories and for individual indicators; • Rating (very high, high, medium, low, very low) for overall assessment, as well as for categories and individual indicators.
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	Four high-level categories: GHG emissions, renewable energy, energy use, climate policy: • The first three categories are defined by four indicators: Current Level, Past Trend, Well-Below-2°C Compatibility of the Current Level, and Well-Below-2°C Compatibility of the Countries' 2030 Target; • Climate policy: assessment of implementation and stringency of national & international policies by +450 domestic experts. Weighting: • GHG Emissions (40% of overall score): 10% each indicator; • Renewable Energy (20% of overall score): 5% each indicator; • Energy Use (20% of overall score): 5% each indicator; • Climate Policy (20% of overall score): 10% each indicator.
Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data is used to: • Well-Below-2°C Compatibility of the Current Level indicators (GHG emissions, energy use and renewable energy use): To derive a decarbonization benchmark for the asset's current climate performance and assess its (mis)alignment; • Well-Below-2°C Compatibility of the Countries' 2030 Target indicators (GHG emissions, energy use and renewable energy use): To derive a decarbonization benchmark for the asset's targets climate performance and assess its (mis)alignment.

Scenario(s) and pathway(s) used	Well-Below-2°C
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	A country can attain the maximum rating if it gets a "very high" for all four categories. To be graded "very high" in a given category, at least 50% of the respective indicators need to be rated as well as "very high" and the remaining as "high".
What stage(s) of alignment does the output measure?	Assets with 1. aligned targets and 2. aligned current performance can be identified. Past trends in these three categories are also considered, even though the dataset does not inherently provide their alignment with the 1.5°C pathways. A detailed alignment assessment can be completed as part of an in-depth analysis request.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	No aggregation at portfolio-level.
Applicability	
Asset class	Sovereign
Documentation and detailed method availability	CCPI 2023
Coverage	60+ countries, including G20 and EU (4 more countries added for the CCPI 2024).
Sector coverage	All sectors, including LULUCF.
Methodology	
General	NR
Main changes vs Cookbook	Not included in Alignment Cookbook.
Climate performance input data	Assesses for each asset: • Four high-level categories: GHG emissions, renewable energy & energy use, climate policy: o The first three categories are defined by four indicators: Current Level, Past Trend, Well-Below-2°C Compatibility of the Current Level, and Well-Below-2°C Compatibility of the Countries' 2030 Target; o Climate policy: assessment of implementation and stringency of national & international policies by +450 domestic experts. • Uses disclosed data (PRIMAP, FAO (Food and Agriculture Organisation of the UN), IEA (international energy agency), UN-DATA World population prospects databases, IMF GDP projections), and evaluations of +450 domestic experts; • Assets with no data are excluded.
Focus on the attributes rated using scenario data as an input	Well-Below-2°C Compatibility of the Current Level indicators (GHG emissions, energy use and renewable energy use): • Uses emission per capita, Energy intensity per capita and Renewable energy share to measure climate performance; • Allocation principle: o Decarbonization pathways: ▪ Per capita emissions intensity convergence to net zero in 2050 (baseline: 1990 for Annex 1 countries

	and when they reach the global average or by 2015 at the latest for others). o Energy pathways: ▪ 100% renewable by 2050 (from 2010); ▪ 60 gigajoules per capita by 2050 (from 1990). • Assigns a performance score/rank/rating based on the difference between the asset's current climate performance and its benchmark (point-in-time gap analysis). Well-Below-2°C Compatibility of the Countries' 2030 Target: • Uses Nationally Determined Contributions (NDCs), communicated to the UNFCCC and for GHGs CAT if country is covered by CAT; • Same allocation principle as previous criteria; • Assigns a performance score/rank/rating based on the difference between the asset's projected climate performance in 2030 and its benchmark (point-in-time gap analysis).
Additional analytical step(s)	• Rates the other indicators and criteria; • Weights the results at asset-level: ○ GHG Emissions (40% of overall score): 10% each indicator; ○ Renewable Energy (20% of overall score): 5% each indicator; ○ Energy Use (20% of overall score): 5% each indicator; ○ Climate Policy (20% of overall score): 10% each indicator.
Sector/portfolio-level aggregation	NR
Focus on how financial institutions are rated within the methodology	NR
Planned updates	A new CCPI version is regularly released once in a year. Thus, there are annual updates on the included countries (plus new countries if they become relevant). Additionally, there is a planned methodological update in 2025 or 2026.

Moody's

Net Zero Assessments

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level
Connection with other methods developed by the same organisation	**Temperature alignment data** (see Moody's Temperature Alignment Data review in this appendix) is used as an input.
Output metric(s)	Alignment 5-point scale from NZ-1 (highest score) to NZ-5 (lowest score). Ambition, implementation and governance scores: • Ambition from 1.5 °C to above 2.5 °C (6 levels); • Implementation from strong to undeveloped (5 levels); • Governance from Tier 1 to Tier 4. Ambition and implementation scores available for the short- (to 2035) and long-term, scope 1 & 2 and scope 3.
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	1. Ambition: level of ambition of the emissions cuts implied by an entity's targets*; 2. Implementation: implementation quality of an entity's transition plan, considering the actions and assumptions of an entity's emissions transition plan as well as the degree of alignment between its business and climate strategies; 3. Governance: strength of the structures and processes an entity has put in place to support the achievement of its emissions reduction targets. Weighted using maturity scale.
Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data is used to derive a decarbonization benchmark to assess the level of ambition of the entity's target. Feeds into the Temperature Alignment data that is used to rate the criteria ambition.
Scenario(s) and pathway(s) used	See **Temperature Alignment Data** review in this appendix (IEA STEPS, SDS and NZE 2050).
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	NZ-1 rating if the entity has a leading emissions reduction profile. Its emissions reduction targets are consistent with an ambition to limit temperature increases to at most 1.5 °C. Implementation and governance oversight are supportive of reaching the ambitious targets. NZ-2/3 rating if the entity has an advanced emissions reduction profile. Its emissions reduction targets are consistent with an ambition to limit temperature increases to at most well below 2 °C. Where targets are more ambitious, the score is constrained by implementation or governance risks.
What stage(s) of alignment does the output measure?	Companies with an aligned ambition can be identified when using the rating of the specific criteria.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	NR
Applicability	

Asset class	Available for non-financial corporates and public sector entities; Excludes project and structured finance, and public entities that do not have their own GHG targets.
Documentation and detailed method availability	MIS Net Zero Assessments
Coverage	Available at issuer request.
Sector coverage	All macroeconomic sectors, except finance, insurance and REITs.
Methodology	
General	
Main changes since the publication of the 2020 Alignment Cookbook	Not included in the Alignment Cookbook.
Climate performance input data	• Derives and adjusts **Temperature Alignment Data** (see Moody's Temperature Alignment Data review in this appendix); • Assign an Implementation score based on an evaluation of key actions and assumptions along two dimensions: technical and business; • Assigns a GHG Governance score that considers GHG accounting (strength of GHG Disclosure and third-party assurance e.g.) and integration of climate objectives (Quality of board oversight and management incentives e.g.).
Focus on the attributes rated using scenario data as an input	• See **Temperature Alignment Data** calculation (review in this appendix); • Adjusts downward or upward the derived Implied Temperature Rise score based on: o Target coverage; o Discrepancy in scope 1 & 2 ITR derived using a point-in-time and cumulative approach; o Regional benchmarks; o Growth adjustments to intensity targets; o Target type (scope 3 targets).
Additional analytical step(s)	• Weighted using maturity scale: A company's ambition determines the highest Net Zero Assessment score possible. Implementation and GHG Governance may result in downward notching from this level if they are not strong enough to support this scoring level; • Ambition and implementation are assessed over the short-term and long-term, scopes 1 & 2 and scope 3, with more weight given to the short-term and scope 1 & 2.
Sector/portfolio-level aggregation	NR
Focus on how financial institutions are rated within the methodology	Finance, insurance and REITs not yet covered.
Planned updates	See planned updates in Temperature Alignment.

Nec Initiative

NEC score

The Net Environmental Contribution (NEC) rates economic activities in regards with their climate and wider environmental impacts on a scale from -100% to +100%, enabling economic actors to identify contributors, activities contributing to the ecological transition, with transition opportunities, and destructors, activities damaging the environment, exposed to transition risks.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level; Portfolio-level
Connection with other methods developed by the same organisation	The NEC Finance methodology include a module on sovereign bonds that can be used as a standalone for this asset class.
Output metric(s)	NEC Score ranging from -100% up to +100%. The NEC is a bottom-up metric is designed to aggregate economic activities, taking into account products and services. It Is designed to assess: • A business unit; • A project; • An organization (for profit or not; Listed or not); • An asset: bond, loan, infrastructure, sovereign…; • A portfolio.
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	Depends on the sector/activity. Mixture of quantitative (e.g. GHG emissions) across multiple environmental impacts and value chain stages, qualitative indicators (e.g. use of standards, product characteristics…), and exposure indicators (e.g. revenue generated within each activity). The weighting between each criteria and value chain stage depends on the activity and sector.
Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data not used directly but the final calibration is done relative to defined “eco-solutions” per activities and sectors, which can be seen as aligned to the energy and ecological transition.
Scenario(s) and pathway(s) used	NR
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	Generates revenue from “aligned” activities as defined within each sectoral methodology.
What stage(s) of alignment does the output measure?	NR
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	Depends on the method chosen to aggregate by the user.
Applicability	

Asset class	Corporates; infrastructure (greenfield and brown field); real estate; sovereigns
Documentation and detailed method availability	One generic Handbook and 15 sectorial handbooks, all freely available here. Current version: 1.0
Coverage	The NECi does not distribute a dataset. Iceberg Datalab distributes a dataset of calculated NEC scores on around 3200 issuers.
Sector coverage	15 sectors avec covered: Apparel & Textile // Appliances // Basic Materials // Building & Real Estate // Chemistry // Electricity // Food & Beverage // Fuel // Heat // Household & Personal Care // IT // Mobility & transport // Waste // Water // Wood & paper Finance and Healthcare & Pharma will be included in the upcoming release of v1.1.
Methodology	
General	Criteria taken into account and weighting approach varies based on the sector.
Main changes since the publication of the 2020 Alignment Cookbook	Upcoming general update of all methodologies (sources, calculation protocols, addition of sectors) (v1.1).
Climate performance input data	• Map assets to economic activities (one-to-many); • Assign a NEC score to each activity, covering the most relevant environmental impacts (not only climate) along relevant stages of the value chain. Climate contributes 0% - 100% of the score; on average 50%; o Collect and use a mixture of quantitative (e.g. GHG emissions) and qualitative indicators (e.g. use of standards, product characteristics…). • Calibrate activity-level score between -100% and +100%, +100% representing the activity the most sustainable and scalable to deliver the service (e.g. electric train for transport). NEC below 0%, or today's average, are attributed to activities that are not compatible with the ecological and energy transition: o Sectors that are directly and indirectly (through their value chain) less material to the transition are capped (-33/+33%) – Household & Personal Care or Appliance for instance.
Focus on the attributes rated using scenario data as an input	NR
Additional analytical step(s)	Aggregates? activity-level NEC scores at asset-level based on revenue exposure to each activity.
Sector/portfolio-level aggregation	No aggregation at portfolio-level. See Sycomore AM for an example of how users can aggregate it.
Focus on how financial institutions are rated within the methodology	Upcoming v1.1 version: Fis are evaluated based on what they finance/facilitate. Additional criteria include labelled assets; oil & gas financing; EU taxonomy alignment.
Planned updates	

Transition Pathway Initiative

Carbon performance score

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level
Connection with other methods developed by the same organisation	TPI also distributes a carbon management score based on qualitative indicators.
Output metric(s)	Alignment bands: • 1.5°C for electricity, oil & gas, diversified mining, cement, steel, shipping and aviation/Below 2°C for paper and aluminium/2°C (high efficiency) for autos; • Below 2°C for electricity, oil & gas, diversified mining, cement, steel, shipping and aviation/2°C for paper and aluminium/2°C (shift-improve) for autos; • National pledges for electricity, oil & gas, diversified mining, cement, steel/international pledges for shipping and aviation/Paris pledge for autos, paper and aluminium; • Not aligned; • No or unsuitable disclosure. Other indicator/methodology: Carbon management score that rates the asset's management quality of greenhouse gas emissions and risks/opportunities related to the low-carbon transition.
Scenario(s) and pathway(s) used	Multiple, including NZE 2050, IEA ETP, custom.
Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	To be given the highest rating, company emission intensities need to be equal to or below the most ambitious emission intensity benchmarks. Alignment scores are provided across three timeframes: 2025- (short-term), 2035 (medium-term) and 2050 (long-term). Please note the short-term alignment (2025) will change to 2027 for any upcoming assessments.
What stage(s) of alignment does the output measure?	Possible to identify assets with aligned targets and aligned current performance by reading the graph/looking at the underlying data.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	No aggregation at portfolio-level.
Can the users access the derived alignment benchmark(s) data against which assets/portfolios are evaluated?	Users can access asset-level benchmark data.
Applicability	
Asset class	Corporate asset classes (listed equities and corporate bonds).
Documentation and detailed method availability	Multiple methodology documents, per sector.
Coverage	362 companies as of September 2023; additional companies covered on carbon management only.

Sector coverage	• 10 sectors: Airlines, Aluminium, Autos, Cement, Diversified mining, Electric utilities, Oil & Gas, Paper, Shipping and Steel; • Additional sectors covered for the carbon management score only, including banks.
Methodology	
General	NR
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Scenario input data	• Uses scenario data to derive a decarbonization benchmark for the asset under consideration and assess its (mis)alignment; • Builds benchmarks at asset-level for each temperature outcome: o Uses multiple scenarios including NZE 2050, IEA ETP, and custom scenarios. • Uses the SDA approach: o The benchmarks are derived by assuming that emissions per unit of production should converge to the same level in 2025, 2035 or 2050 (intensity convergence principle).
Climate performance input data	• Uses GHG emissions per unit of production to measure climate performance: o Uses disclosed data only; o Includes scope 1, 2 or 3 where relevant. • Estimates the future climate performance of each company using disclosed emissions reduction targets: o When targets only apply to a certain proportion of emissions, the remainder is kept at current-level; o When an asset does not have a target, emissions are kept constant at current levels; o When a target has a shorter time horizon than the assessment, emissions are kept at target-level thereafter.
Alignment assessment	• Performs alignment assessment at asset-level; • Performs alignment assessment using point-in-time assessment: compares the distance between projected emissions intensity and its benchmark in 2025, 2035 and 2050; • Calculates the ITR score by interpolation (i.e. using multiple pathways corresponding to different temperatures). The carbon performance score is attributed based on the benchmark to which the projected climate performance is closest.
Additional analytical steps	NR
Sector/portfolio-level aggregation	NR

Focus on how financial institutions are rated within the methodology	**TPI** has recently published a framework to assess **Banks** (See TPI Banks methodology review in this appendix).
Planned updates	TPI Centre regularly looks to update its methodologies based on the latest modelling data from the likes of the International Energy Agency (IEA).

ASCOR project

(Transition Pathway Initiative Centre, LSE)

The TPI Centre, in partnership with a group of asset owners, asset managers and investor networks (see Partners here), developed a framework of indicators to assess how countries are managing the low-carbon transition and the impacts of climate change. After a consultation period to gather feedback from a broad range of stakeholders, the final version of the framework and its methodology were published in the ASCOR methodology note.

Use case & interpretation	
Primary objective	Alignment assessment
Level	Financial asset-level
Connection with other methods developed by the same organisation	See **TPI for corporates** (real economy sectors as well as banks) (See TPI methodology review in this appendix).
Output metric(s)	Results at area and indicator-levels.
Criteria rated to assess the alignment performance at asset-level and weighting approach Criteria with an * directly integrate scenario-based alignment performance assessment	Pillar 1: Emission Pathways (EP) • EP1: Emission trends*; • EP2: 2030 targets*; • EP3: Net zero targets*. Pillar 2: Climate Policies (CP) • CP1: Climate legislation; • CP2: Carbon pricing; • CP3: Fossil fuels; • CP4: Sectoral transitions*; • CP5: Adaptation; • CP6: Just transition. Pillar 3: Climate Finance (CF) • CF1: International climate finance; • CF2: Transparency of climate costing; • CF3: Transparency of climate spending; • CF4: Renewable energy opportunities. Weighing approach: Binary • No country-level aggregation; • Area-level: Yes if all applicable indicators in the area are rated as Yes; Partial; No; • Indicator-level: "Yes" if all required criteria for this indicator are met; No.
Focus on the use of scenario data: how and in which of the above attributes is scenario data used?	Scenario data is used to derive a decarbonization benchmark and fair share allocation for the asset's 5-year trend and its 2030 target to assess its (mis)alignment in EP1 and EP2.
Scenario(s) and pathway(s) used	• Benchmark view: National 1.5°C-aligned benchmarks developed by Climate Analytics in its 1.5°C National Pathway Explorer; • Fair share view: C1 models from the Intergovernmental Panel on Climate Change's Sixth Assessment Report (consistent with 1.5°C).

Under what condition(s) is a financial asset attributed the best rating (see output metric(s) above for more details)?	NR
What stage(s) of alignment does the output measure?	It is possible to identify in the dataset: 1. Assets that have its most recent 5-year trend aligned with meeting the country's 1.5°C benchmark/fair share; 2. Assets that have 2030 target aligned with its 1.5°C benchmark/fair share.
Under what condition(s) is a portfolio attributed the best rating (see output metric(s) above for more details)?	NR
Applicability	
Asset class	Sovereign
Documentation and detailed method availability	ASCOR framework: methodology note, November 2023
Coverage	25 countries.
Sector coverage	All sectors, in(ex)cluding LULUCF depending on the indicator.
Methodology	
General	
Main changes since the publication of the 2020 Alignment Cookbook	Not included in Alignment Cookbook.
Climate performance input data Criteria with an * directly integrate scenario-based alignment performance assessment	Pillar 1: Emission Pathways (EP) • EP1: Emission trends*; • EP2: 2030 targets*; • EP3: Net zero targets*. Pillar 2: Climate Policies (CP) • CP1: Climate legislation; • CP2: Carbon pricing; • CP3: Fossil fuels; • CP4: Sectoral transitions*; • CP5: Adaptation; • CP6: Just transition. Pillar 3: Climate Finance (CF) • CF1: International climate finance; • CF2: Transparency of climate costing; • CF3: Transparency of climate spending; • CF4: Renewable energy opportunities.
Focus on the attributes rated using scenario data as an input	Pillar 1 - Indicator EP1 b - Is the most recent 5-year trend aligned with meeting the country's 1.5°C benchmark? • Uses the National 1.5°C-aligned benchmarks developed by Climate Analytics in its 1.5°C National Pathway Explorer to build a decarbonization benchmark for the asset's 5-year emissions trend and assess its (mis)alignment; • Uses a 5-year trend in absolute production-based emissions to measure climate performance; • Computes two types of output metric: Binary and degree of alignment (%).

	Pillar 1 - Indicator EP1 c - Is the most recent 5-year trend aligned with meeting the country's 1.5°C fair share? • Uses the C1 models from the Intergovernmental Panel on Climate Change's Sixth Assessment Report (fair share) to build a decarbonization fair share for the asset's 5-year trend and assess its (mis)alignment; • Allocates national carbon budget using fair share based on population, PPP-adjusted GDP per capita, and historical emissions; • Uses 5-year trend in absolute production-based emissions to measure climate performance; • Computes two types of output metric: Binary and degree of alignment (%). Pillar 1 - Indicators EP2 c - Is the country's 2030 target aligned with its 1.5°C benchmark? • Uses the National 1.5°C-aligned benchmarks developed by Climate Analytics in its 1.5°C National Pathway Explorer to build a decarbonization benchmark for the asset's 2030 target and assess its (mis)alignment; • Uses Targeted 2030 emission level and country's NDCs as an input to measure climate performance; • Performs alignment assessment at a specific time, point-in-time (2030); • Computes two types of output metric: Binary and degree of alignment (%). Pillar 1 - Indicators EP2 d - Is the country's 2030 target aligned with its 1.5°C fair share? • Uses the C1 models from the Intergovernmental Panel on Climate Change's Sixth Assessment Report (fair share) to build a decarbonization fair share for the asset's 2030 target and assess its (mis)alignment; • Allocates national carbon budget fair share based on population, PPP-adjusted GDP per capita, and historical emissions; • Uses Targeted 2030 emission level and country's NDCs as an input to measure climate performance; • Performs alignment assessment at a specific time, point-in-time (2030); • Computes two types of output metric: Binary and degree of alignment (%). Pillar 1 – Indicators EP3 on Net Zero Targets also include scenario-based elements, notably on year of the country's net zero target(s). Pillar 2 – Indicator CP4 d requires a country to have made either an economy-wide net zero commitment or a net zero electricity commitment aligned with 1.5°C. Based on the IEA's Net Zero Emissions by 2050 scenario (IEA, 2023), electricity sector emissions are considered aligned with 1.5°C if they reach net

	zero by 2035 in high-income countries, by 2040 in China and by 2045 in the rest of the world.
Additional analytical step(s)	• Rates other indicators and areas that are not scenario-based; • Aggregates the rating at area-level using a binary approach.
Sector/portfolio-level aggregation	NR
Focus on how financial institutions are rated within the methodology	NR
Planned updates	Annual updates to each country assessment; expansion of coverage to ~70 in 2024.

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ACRONYMS

ACT: Assessing low Carbon Transition

ADEME: Agence de l'Environnement et de la Maîtrise de l'Energie

ASCOR: Assessing Sovereign Climate-related Opportunities and Risks

AUM: Asset Under Management

CAPA: Consolidated Alignment Performance Analytics

CAPEX: Capital Expenditure

CA 100+: Climate Action 100+

CBI: Climate Bond Initiative

CCPI: Climate Change Performance Index

CDP: Carbon Disclosure Project

CDP NZAD: CDP Net-Zero Alignment Dataset

COP: Conference of the Parties

CPI: Climate Policy Initiative

CRREM: Carbon Risk Real Estate Monitor

CSLN: Climate Safe Lending Network

CSRD: Corporate Sustainability Reporting Directive

C3D: Corporate Due Diligence Directive

EBA: European Banking Authority

ECB: European Central Bank

ESRS: European Sustainability Reporting Standards

EU: European Union

ETP: Energy Technology Perspectives

EV: Enterprise Value

EVIC: Enterprise Value Including Cash

FI: Financial Institutions

GFANZ: Glasgow Financial Alliance for Net Zero

GHG: Greenhouse Gas

HLEG: High-Level Expert Group on sustainable finance

IEA: International Energy Agency

IFRS ISSB: International Financial Reporting Standards International Sustainability Standards BoardIIGCC:

Institutional Investors Group on Climate Change

ILB: Institut Louis Bachelier

IMF: International Monetary Fund

IPCC: Intergovernmental Panel on Climate Change

ITR: Implied Temperature Rise

I4CE: Institute for Climate Economics

KPI: Key Performance Indicator

MAS: Monetary Authority of Singapore

NEC: Net Environmental Contribution

NGFS: Network for Greening the Financial System

NGO: Non-Governmental Organization

NZAOA: Net-Zero Asset Owner Alliance

NZAM: Net Zero Asset Managers

NZBA: Net-Zero Banking Alliance

NZE: Net Zero Emissions

NZIA: Net-Zero Insurance Alliance

NZFSPA: Net Zero Financial Service Providers Alliance

NZICI: Net Zero Investment Consultants Initiative

NZIF: Net Zero Investment Framework

OECD: Organisation for Economic Co-operation and Development

OFD: Observatoire de la Finance Durable

PACTA: Paris Agreement Capital Transition Assessment

PACTA COP: PACTA Coordinated Projects

PAII: Paris Aligned Investment Initiative

PAT: Portfolio Alignment Team

PCAF: Partnership for Carbon Accounting Financials

RCPs: Representative Concentration Pathways

RMI: Rocky Mountain Institute

SBTi: Science Based Targets Initiative

SBTi FINT: SBTi Financial Institutions Near-Term

SBTi FINZ: SBTi Financial Institutions Net-Zero

SDA: Sectoral Decarbonization Approach

SFDR: Sustainable Finance Disclosure Regulation

SME: Small and Medium Enterprises

SMI AMAO: Sustainable Markets Initiative's Asset Manager and Asset Owner Task Force

TCFD: Task Force on Climate-Related Financial Disclosures

TEG: Technical Expert Group

TPI: Transition Pathway Initiative

TSP: Target-Setting Protocol

UNEP FI: United Nations Environment Programme Finance Initiative

UNFCCC: United Nations Framework Convention on Climate Change

UNFCCC SCF: UNFCCC Standing Committee on Finance

WACI: Weighted Average Carbon Intensity

WWF: World Wildlife Fund

GLOSSARY

Activity-alignment methodologies focus on past, current and/or projected activity alignment, using for example such as green brown or taxonomic shares, captured through revenue, production, or other metrics. This is the equivalent of GFANZ transition-based metrics. Technology-alignment is a special form of activity-alignment.

(Alignment) benchmark: We use the term "benchmark" as in the GFANZ Portfolio Alignment Measurement workstream[60] work rather than based on its traditional financial meaning, to designate the trajectory that portfolios and/or financial assets are expected to follow under different scenario pathways, leading to specific temperature outcomes.

Alignment datasets are built on alignment methodologies and generate metrics.

Alignment frameworks are developed by individual organisations, initiatives and coalitions of organisations. They provide written, collective, and public guidance to devise transition plans, including assessing, managing, setting targets, taking action and/or disclosing on the alignment of their activities for a specific set of organisations.

Alignment journey: Represents the various steps that an economic actor can/should take to align with the 1.5°C objective of the Paris Agreements: Measure climate performance, Set target(s), Assess alignment, Develop a strategy, Take action, Disclose.

Alignment methodologies refer to the specific and formalised procedures, or design choices, and metrics used to assess alignment and/or set an alignment target. The delimitation of what an alignment methodology is, and perhaps more importantly is not, is not always clear and different definitions exist. Here, we use a restrictive definition: "alignment methodologies" put in perspective the climate performance of the object under consideration (FI, portfolio, asset) with the global temperature limitation goal, usually using a forward-looking and/or scenario-based view.

Alignment metrics refer to the specific metrics used to assess alignment and/or set targets. These include the Implied Temperature rise metric for example.

Allocation: refers to the distribution or assignment of GHG emissions among various entities (e.g., countries, or sectors, companies) within a given time frame. This allocation is often based on a calculated carbon budget, which represents the maximum amount of greenhouse gases that can be emitted while staying within a specified temperature limit, such as the 1.5°C or 2°C.

Asset class: a group of financial instruments or securities that share similar characteristics and behave in a similar way in the financial markets. These characteristics may include the type of underlying assets, risk levels, return profiles, and market dynamics. Common asset classes include stocks (equities), bonds (fixed income), cash or cash equivalents, and alternative investments like real estate, commodities, and hedge funds.

Benchmark divergence metrics: metrics can be expressed as a percentage deviation, or absolute emissions/technology overshoot over/below the 1.5°C or well below 2°C benchmark. The resulting metric indicates "how far the projected company [or portfolio] [climate performance] are overshooting or undershooting this benchmark." (PAT, 2020; PAT, 2021; GFANZ, 2022).

Binary metrics can be expressed using Y/N, and often, but not always, reflect the "percentage of portfolio companies with validated science-based emissions reduction targets." (PAT, 2020; PAT, 2021; GFANZ, 2022).

Carbon removals: Anthropogenic activities removing CO_2 from the atmosphere and durably storing it in geological, terrestrial, or ocean reservoirs, or in products. It includes existing and potential anthropogenic enhancement of biological or geochemical sinks and direct air capture and storage, but excludes natural CO_2 uptake not directly caused by human activities (IPCC, 2022).

60 Previously the TCFD Portfolio Alignment Team.

Climate performance measurement: comprises all the methodologies that seek to measure the current climate performance of an asset or portfolio, such as emissions footprinting (and associated standards such as the GHG Protocol and PCAF), taxonomy-alignment or fossil fuel exposure.

Climate solutions: Climate solutions can be defined as "Technologies, services, tools, or social and behavioural changes that directly contribute to the elimination, removal, or reduction of real economy GHG emissions or that directly support the expansion of these solutions" (GFANZ, 2022).

Datasets: a collection of data or information organised and presented in a structured format.

Design choices: refer to the methodological choices, or key judgements embedded within alignment methodologies, such as choice of scenario, value chain scope or time horizon (PAT, 2020, PAT, 2021, GFANZ, 2022).

Disclosure frameworks (both regulatory and voluntary): refer to a set of guidelines, principles, or standards that provide a structured approach for reporting or disclosing specific types of information. Disclosure frameworks may either be voluntary or mandatory.

Emissions-alignment methodologies focus on past, current and/or projected emissions alignment.

Financial activity: Activities undertaken by financial institutions to provide financial services to their counterparties including, but not exclusive to, investing, lending, managing, transacting, and insurance underwriting. In this consultation draft it is used as a collective term to refer to a group of activities that may be composed of several underlying asset classes (SBTi, 2023).

Homogeneous sectors: Sectors that can be described using a single physical indicator (SBTi, 2015).

Implied Temperature Rise (ITR) metrics: scores that translate the (in)compatibility of a company's or portfolio's past, current and/or projected climate performance with its benchmark.

Maturity scale: A set of parameters by which portfolio holdings are evaluated against different stages of alignment (SBTi, 2023).

Maturity scale alignment metrics: consist in classifying assets and portfolios in alignment buckets corresponding to different maturity levels. This requires listing a set of attributes that an asset or portfolio must exhibit to be considered within a specific category.

Metrics: refer to quantifiable measures or parameters used to assess, evaluate, or track specific aspects or performance in a particular area, providing a means of measurement or comparison.

Mitigation efforts: encompass human interventions, technologies, practices, or policies aimed at reducing emissions or enhancing the sinks of greenhouse gases in response to climate change. These efforts include a range of measures such as adopting renewable energy technologies, implementing waste minimization processes, promoting public transport commuting practices, and other strategies that contribute to the reduction of greenhouse gas emissions or enhance their removal from the atmosphere.

Remaining carbon budget: Estimated cumulative net global anthropogenic CO_2 emissions from the start of 2018 to the time that anthropogenic CO_2 emissions reach net zero that would result, at some probability, in limiting global warming to a given level, accounting for the impact of other anthropogenic emissions (IPCC, 2022).

Portfolio emissions footprinting: refers to the quantification of the greenhouse gas emissions associated with financial flows to assess their negative contribution to climate change. Footprinting encompasses a wide range of methodologies and hypotheses, which have been widely studied and formalised in standards such as PCAF.

Virtual/Real changes: Taking the example of the power sector, the 2° Investing Initiative shows that decarbonization may be achieved either through virtual or real changes. Virtual changes include buying already-existing green power generation capacity or selling carbon-intensive capacity. Real changes, on the other hand, include building new green generation capacity, closing and/or ramping down carbon-intensive capacity (2° Investing Initiative, 2022).

Residual emissions: refer to the remaining greenhouse gas emissions that persist after all possible mitigation measures have been applied.

Scores are usually set on a continuous alphabetical or numerical scale and are built by weighting different criteria. The relationship between an asset's or portfolio's performance on specific criteria is therefore less direct than within maturity scale methodologies.

Sectoral Decarbonization Approach: The Sectoral Decarbonization Approach (SDA) is a method for companies to set GHG reduction targets necessary to stay within a well below 2°C temperature rise above pre industrial levels (SBTi, 2015).

System myopia: The temperature metric assumes that everyone else (portfolio/companies/parts of the economy not captured by model e.g. citizens) do their part as well (ILB, 2020).

Transition plan: means an aspect of the undertaking's overall strategy that lays out the entity's targets and actions for its transition towards a climate-neutral or sustainable economy, including actions, such as reducing its GHG emissions in line with the objective of limiting climate change to 1.5 °C (European Commission, 2023).

Transition planning: the process by which undertakings translate their environmental and climate ambitions into actions (European Commission, 2023).

Transition-plan alignment methodologies focus on the quality of an asset's transition plan and global approach to net zero. These methodologies usually rely on a range of criteria, at least one of which is often assessed using emissions-alignment (e.g. assessing decarbonization target's alignment) or activity-alignment methodologies (e.g. assessing CAPEX alignment).