Institut Louis Bachelier

FINANCIAL SECTOR'S PATH TO GLOBAL CLIMATE GOALS

APRIL 2025

A comprehensive framework to assess the consolidated alignment of financial institutions

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Introduction

Climate policy goals are largely depending on the success of aligning finance with carbon neutrality targets as called for by Article 2.1c of the Paris Agreement, and the role of the private financial sector is crucial. **The importance of monitoring such success with robust assessments tools and methods at an investment or financing portfolio-level**, as highlighted in the recent Alignment Cookbook Review **needs in our view to be also scrutinized and challenged at a consolidated level, when aggregated FIs efforts at a level compatible with measuring progress of the global stocktake**.

The recent pushback against climate finance, coupled with GFANZ's retreat from emissions reduction targets and alignment measures, significantly heightens the risk of diminished climate ambition and incoherent decarbonisation targets within the financial sector, at a critical point in time. GFANZ has been instrumental in building an ambitious momentum for credible and reliable FIs' climate commitment and **we fear this new strategic shift may undermines the quality of alignment tool assessments**, potentially jeopardizing any prospects for methodological standardization and for closing the related data gap, making any consolidated view a further challenge to all stakeholders.

Conversely r**egulators are maintaining the pressure on FIs to strengthen the quality of their climate financial related disclosure**. While their focus solely remains on climate risk related issues that can threaten financial stability, **some regulators have expanded the scope of FIs reporting to emissions alignment metrics**; in that respect the combined effect of CSRD together with the technical standards on Pillar 3 disclosures on ESG risks of the European Banking Authority related to financing taxonomy-aligned activities and those consistent with IEA NZE scenario should soon deliver consistent and relevant data for banks operating in Europe.

Against such backdrop, **this report timely highlights the need to broaden the assessment of the finance sector's efforts in the low-carbon transition beyond emission alignment metrics—while still considering them essential—to include two additional metrics families: Transition alignment and Financing alignment**. From this perspective we align with GFANZ on the importance of mobilising capital globally and we address the barriers to effectively evaluating financial institutions' commitments in this regard, and to developing a comprehensive consolidated view at the sector-level.

Executive Summary

This follow-up report of the Alignment Cookbook 2 review published in 2024 explores the foundational rationale and initial considerations for assessing the consolidated climate alignment of financial institutions. While it leverages on approaches available at the FI- and portfolio-level, it is not the primary focus of this report that emphasizes the critical role of the financial sector in addressing climate challenges and outlines the complexities involved in evaluating its collective alignment with the Paris Agreement's objectives[2].

1. Why assessing the alignment of groups of financial institutions is essential

Achieving the Paris Agreement's goal of limiting global warming to well below 2°C while pursuing efforts to limit warming to 1.5°C requires a deep transformation of the global economy. Financial institutions play a pivotal role in facilitating this transformation by redirecting financial flows toward low-carbon development pathways, as highlighted in Article 2.1(c) of the Agreement.

However, alignment remains a relative concept due to the lack of consensus on transition scenarios and burden-sharing among stakeholders. Despite this uncertainty, the financial sector is uniquely positioned to act as a catalyst for change through targeted investments, collaboration within net-zero alliances, and adherence to emerging regulatory frameworks.

To monitor progress, the development of comprehensive stocktakes for financial sector alignment is critical. Current efforts by regulators, such as the EU Taxonomy, SFDR, and national strategies, have made strides but remain fragmented. Non-governmental organizations and initiatives like GFANZ (Glasgow Financial Alliance for Net Zero) are stepping in to provide methodologies and tools to address these gaps. Assessing consolidated climate alignment can reveal whether financial flows are being redirected at the scale and pace required to meet global climate targets.

While there is an increasing body of research on assessing alignment at the entity- and portfolio-

[2] For detailed review of climate alignment approaches at the FI- and portfolio-levels, see The Alignment Cookbook 2 [2024].

level, assessing the alignment of a group of financial institutions has rarely been discussed beyond measures on the scale and volume of financial initiatives. A few organisations are indirectly working on this topic and producing estimates – that in the authors' view focus on one side of the equation, such as membership to net zero initiatives or financing of renewable energy or fossil fuels projects and fail to reconcile the micro and macro-level. A review of existing estimates of the climate alignment of finance show that while (partial) approaches (and estimates) exist at different levels (real-economy, asset-class- investors/FIs, financial jurisdiction), there is a lack of linkages between the assessments at these different levels, and gaps remains on specific asset classes or assets, such as assets in transition [OECD, 2024].

2. First considerations for assessing the alignment of groups of financial institutions

Assessing the alignment of financial institutions as a group involves defining the perimeter of the group of FIs being assessed and the time frame over which to do so.

Historically, approaches seeking to assess the consolidated alignment of a group of FIs have focussed on "counting" the number of FIs considered "aligned" by an external framework or initiative. The authors of this report argue that the consolidated alignment of a group of FIs is more than the sum of its parts, and a more rounded view should include three complementary dimensions: "Who provides financing, what does it finance, and what outcomes does it achieve in terms of alignment with climate goals?"

Defining alignment and levels of consolidation

Alignment is the compatibility of a financial entity's climate performance with pathways or GHG emissions budgets consistent with net-zero objectives. This can be assessed at various levels, including individual institutions, groups of institutions, or the broader financial system. Segmenting the financial system into these levels allows for tailored analysis while enabling meaningful aggregation across asset classes, sectors, and financial services.

The temporal dynamics of alignment

Alignment evolves over time and must consider past, present, and projected climate performance. Evaluating both existing investments (stocks) and new capital deployed annually (flows) is essential to understand how financial institutions (FIs) support the transition. This dual focus helps assess whether portfolios are aligned with long-term decarbonization goals. Indeed, new annual flows can be aligned – while the accumulated stock of capital may not be, because of past misalignment of financial flows.

The multiple facets of alignment

The authors of this report recommend that consolidated alignment assessments encompass three interrelated facets, each addressing a specific aspect of the overarching question: "Who finances what, and for what outcome?"

a. **FI Transition alignment**
b. **Financing alignment**
c. **FI Emissions alignment**

Each of these facets provides unique insights, and their integration is necessary for a holistic assessment of group-level alignment.

Historically, important dimensions have been missing from alignment approaches – in particular "what is financed" and "real-world impact" of FI practices in terms of decarbonization. Combining the above three approaches seeks to overcome these challenges.

To provide actionable insights, a robust assessment methodology should link individual institution performance with macro-level objectives. This requires reconciling diverse data inputs, ensuring transparency, and avoiding distortions. Accounting for the unique impact of different financial activities ensures that progress in one area does not overshadow gaps in others.

By addressing these dimensions, consolidated alignment assessments can clarify whether financial institutions are collectively contributing to global climate objectives.

3. Deep-dive into FI Transition alignment approaches

FI Transition alignment approaches focus on evaluating whether individual financial institutions within a defined group are aligned with climate objectives. This approach answers the question: "To which extent the chosen group is constituted of aligned financial institutions?"

These approaches are the simplest and most widely applied. They often assess institutions based on their commitments, governance, decarbonization levers such as engagement and adoption of frameworks such as science-based targets. However, variations in the definitions and quality of the methodologies used across different frameworks can make comparisons difficult.

Steps to implement this approach include defining the criteria to define whether a specific institution is aligned or not, evaluating individual institutions against these criteria, and aggregating the results into a consolidated metric at group-level. Aggregation can be based on the number of aligned institutions, financial metrics, or emissions data, each with specific strengths and limitations.

While these approaches provide a high-level overview, they have limitations. They do not establish direct links to emissions reductions or ensure alignment with global carbon budgets at the macro level. Additional research is needed to integrate data on financial flows and stocks and emissions to make this approach more robust and comprehensive.

4. Deep-dive into Financing alignment approaches

Financing alignment approaches focus on tracking the reallocation of capital towards climate-aligned investments away from "climate-incompatible" investments. These approaches aim to assess whether financial flows (and stocks) are being redirected at the necessary scale and pace to meet global climate goals.

These approaches can be applied to both instruments with known use of proceeds, such as green bonds, and those with unknown use of proceeds, such as corporate loans. Historically, they have been used in the context of macro analysis, unrelated to specific FIs, as well as at FI-level focussing on fossil fuels specifically. Increasingly, there are discussions of using this approach at FI-level for target-setting and monitoring across all types of assets in relation to the transition (solutions, credibly transitioning, incompatible).

Bridging the gap between individual FIs and macro analysis to produce a consolidated alignment metric would involve defining what constitutes climate-aligned and incompatible financial flows and stocks, identifying current and projected flows, setting alignment benchmarks describing the pace and scale at which financial flows and stocks should be reallocated, and aggregating results.

Key challenges include distinguishing between stock metrics (accumulated financial flows) and flow metrics (new financing activities), as well as addressing the lack of standardization in the classification of financial instruments and counterparties as net-zero aligned. The absence of robust tools to assess general-use financial instruments, to project future flows and stocks, and to derive benchmarks further complicates the analysis. Advancing this approach will require enhanced data availability, improved methodologies for mapping financial flows and stocks to counterparties, and refined tools to assess alignment.

5. Deep-dive into FI Emissions alignment approaches

FI Emissions alignment approaches use the GHG emissions data associated with financial institutions' activities as an input to the analysis. These approaches seek to address the ultimate objective of climate-related finance: achieving measurable reductions in greenhouse gas emissions.

These approaches have historically been used by FIs to assess the alignment of their portfolios, using projected emissions. The same logic could be applied at the consolidated level, for a group of FIs. It would involve retrieving and harmonizing emissions data, addressing inconsistencies in reporting, mitigating double-counting risks, projecting future emissions and assessing alignment against decarbonization benchmarks.

Yet, forward-looking emissions alignment metrics trying to project future emissions (and thus future emission reductions/avoidance) bring with them their own challenges: uncertainty of the

projections, need to build a sound “Business as Usual” reference scenario, attributability of the reduction/avoidance. The authors of this report argue that, in the context of consolidated alignment assessments, emissions’ alignment approaches are best used as an ex-post assessment, to monitor whether FIs changing financing practices have had the desired impact on real world decarbonization.

The main challenge includes the risk of “paper decarbonization”, where emissions reductions are only achieved through metric optimisation (perimeter/methodological changes, adjustment of the portfolio exposure through divestment of some GHG-intensive companies to the profit of light-intensive GHG companies, without any actual effect on real-economy GHG emissions).

Further research is needed to standardize methodologies, integrate emissions data with financial metrics, develop reliable tools to monitor emissions’ reduction and aggregate the results relating to different asset classes and financial services. These efforts should focus on ensuring that these approaches capture the real-world impact of financial institutions’ activities on emissions reduction.

PART 01

01

AN OVERVIEW OF CONSOLIDATED ALIGNMENT ASSESSMENT

USE CASE AND KEY CONSIDERATIONS

1.
WHY DO WE NEED TO ASSESS THE ALIGNMENT OF A GROUP OF FINANCIAL INSTITUTIONS?

1.1. The role of the financial sector in the climate change challenge

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 (and resulting stocks) 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 as ecosystemic services (e.g. ocean behaviour) and economical and social systems relying on non-financial functioning (e.g. volunteering). Thus, making financial flows (and resulting stocks) 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[3] and (ii) there is no need to wait for a full consensus on

[3] 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).

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 has emerged in Europe and other regions of the world [SFDR, 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.

1.2. The need for a financial sector stocktakes

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]. A global stocktake on climate commitments across financial institutions to monitor the achievement and trajectory of the Paris Agreement Article 2.C. requires the design of a consolidated view of the individual alignment performances.

The UNFCCC, the primary organisation responsible for conducting the official global stocktake under the Paris Agreement, reminds that "according to the Paris Agreement, Parties shall periodically take stock of its implementation to assess the collective progress towards achieving the purpose of the Agreement and its long-term goals. It enables countries and other stakeholders to take inventory, to see **where they're collectively making progress toward meeting the goals of the Paris Agreement – and where they are not**. It entails looking at everything related to where the world stands on climate action and support, identifying the gaps, and working together to agree on solutions and pathways to safeguard our future."

This means that every signatory country is expected to build the capacity to track its financial sectors' climate commitments and performance, as well as their alignment with national and international climate targets to assess and to monitor collective alignment progress at a national level. Yet, 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)".

Various initiatives and mechanisms have been introduced by countries to enable such alignment assessment, such as the **Canadian Net-Zero Emissions Accountability Act**, the **UK Green Finance Strategy**, the **People's Bank of China Green Finance Guidelines** or the **EU Taxonomy** and **Sustainable Finance Disclosure Regulation (SFDR)**, (as well as **CSRD and CSDDD** that also contains best-efforts obligation for FIs to provide an explanation and quantification of their transition plan's investments and funding) but, as of today, none of them in the authors' view has yet build the tools and frameworks that are necessary to be able to consolidate climate alignment at a national or a regional level.

In addition, several international bodies and initiatives focus on the risks that climate change and climate change mitigation can expose the financial sector to, rather than its role in contributing to alleviating climate change. International Financial Regulatory Bodies, such as **the Financial Stability Board (FSB)** or the **Basel Committee on Banking Supervision (BCBS)** are all taking a climate-related financial risks approach, pushing for the integration of climate risks into banking supervision and regulations.

The FSB stocktake only considers climate risks and financial stability, embedding the view of Standard-Setting and Framework organisation such as **Task Force on Climate-related Financial Disclosures (TCFD)** that focuses on micro risk assumptions, and the **Network for Greening the Financial System (NGFS)** that both focus on climate-related financial risks. **The European Banking Authority (EBA)** is also **taking a risk-based approach**, supporting the role of climate and environmental risks in the prudential framework of credit institutions and investment firms. While pushing FIs for **further disclosure on their transition-plans**, it primarily sees those for supporting the development of further **risk-based enhancements to the Pillar 1 framework**.

The reasons Financial Regulatory Bodies may appear **underemphasizing the monitoring of financial institutions' green financial flows and financed emissions' alignment** with the Paris Agreement are twofold in the authors' view: 1**. Horizons gap**: despite Carney's warnings, the typical regulatory horizon still tends to focus on short to medium-term financial risks and impacts. **2. Measurement challenge**, as outlined in both our Cookbook reports, comprehensive frameworks for accurately assessing climate are still evolving and their design is not considering the need to consolidate individual financial institution alignment performance.

Against that backdrop, non-governmental organisations and frameworks are **progressively taking over regulators and countries' roles in consolidating and aggregating financial institutions' climate alignment data** to provide a stocktake estimate at various levels. As put by the UNFCCC, "assessing the impact and level of change that financial sector alignment approaches initiate in the real economy is a nascent area of methodological development".

Few research attempts to reconcile assessments of climate alignment at the micro and macro levels. The OECD recently published a review on Aligning Finance with Climate Goals that reviews

existing estimates on the degree of the climate alignment of finance [OECD, 2024] at the macro-level. **GFANZ organisations** are on the front line for monitoring their members net-zero reporting and performances [**NZBA**, 2024; **NZAOA**, 2024].

Beyond the UN related bodies, several organisations play critical roles in shaping climate commitments, monitoring progress, and ensuring accountability within the financial sector. Several of them are disclosing consolidated measures for groups of financial actors (see PACTA COP, the Net Zero Tracker Finance Tracker of the Climate Policy Initiative or the Net Zero Donut of the Observatoire de la Finance Durable as examples) – but this area of research is nascent and incomplete.

1.3. 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 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 the global climate goals (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. A few organisations are indirectly working on this topic and producing estimates – that in the authors' view focus on one side of the equation, such as membership to net zero initiatives or financing of renewable energy or fossil fuels projects and fail to reconcile the micro and macro-level. A review of existing estimates of the climate alignment of finance show that while (partial) approaches (and estimates) exist at different levels (real-economy, asset-class- investors/FIs, financial jurisdiction), there is a lack of linkages between the assessments at these different levels, and gaps remains on specific asset classes or assets, such as assets in transition [OECD, 2024].

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 explore approaches to assess the consolidated alignment of groups 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). 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.

The research project is split into three phases:

- *The first phase was achieved in 2024 through the publication of two reports:*
  - *"The 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 remains at a technical level without judging the relevance of one versus another [ILB, 2024].*
  - *"Implied Temperature Rise of Equity Portfolios: A Sensitivity Analysis Framework" offers quantitative insight into the effect of design decisions on implied temperature rise (ITR) metrics. Alignment methodologies vary widely in design, data inputs, and outcomes. This new tool will help stakeholders identify influential design factors (e.g. choice of benchmark, trajectory modelling, and under/overshoot translation into an Implied Temperature Rating) that significantly influence discrepancies [ILB, 2024].*
- The second phase, achieved through the present report, seeks to identify the different options that are the most suitable to assess the consolidated alignment of a group of financial institutions and suggest an approach.
- The last phase of the CAPA project will apply the lessons learned to forge a Financial Institution transition alignment assessment methodology, building on the most relevant approaches and criteria from the existing frameworks and tools referenced in the Cookbook 2 report. Special care will be taken for this methodology to produce and/or use indicators that can be consolidated to assess the alignment of a group of financial institutions in a meaningful way that connects the dots between the micro and macro-level. This final output method is aiming at feeding a one-stop tool that can assess FIs transition's performance with the objective to contribute to the global stocktake and unlock finance at speed and at scale needed to meet climate goals.

1.4. Objectives of this report

There is a wide and growing body of research on assessing alignment at the non-financial entity and (sub) portfolio-level. Similarly, work to assess alignment at the financial entity-level is ongoing but not yet mature. The Alignment Cookbook 2, published in 2024 as part of the CAPA project, reviews available approaches to assess alignment at the non-financial entity, portfolio- and financial entity levels [ILB, 2024].

On the other hand, assessing the alignment at higher levels of consolidation, beyond the single financial institution entity has rarely been discussed. Few approaches focus on assessing the alignment of a group of financial institutions. This report aims to advance research in this area and build on this emerging theme.

It aims to help answer questions such as: Are financial institutions taking the right commitments in the aggregate (ref the global challenge of respecting the global budget and financing the world of tomorrow)? Are they walking the talk and/or likely to walk the talk in the future? Is it possible to do this assessment, do we have the right kind of data (given the current reporting landscape and regulations for financial institutions) and what is missing? What assumptions do we need to take?

2.
FIRST CONSIDERATIONS ON HOW TO ASSESS THE CONSOLIDATED ALIGNMENT OF A GROUP OF FINANCIAL INSTITUTIONS

2.1. A short reminder on alignment

At its simplest level, "alignment" refers to the consistency or compatibility of 1. the climate performance of the object under consideration (e.g. counterparty, portfolio, financial institution, group of financial institutions) with 2. pathway(s) or budgets commensurate with the net zero planetary objective.

Alignment assessments combine a **range of inputs** (metrics relating to the climate performance of the object under consideration, scenario metrics) to generate an **alignment outcome metric**.

To be noted,

- Even if historically alignment assessments have mostly been performed at counterparty and/or portfolio-level, alignment can theoretically be assessed at any given level (e.g counterparty, portfolio, asset class, sector, economy).
- Within the wider theme of "alignment", one needs to distinguish between the transitioning and the net zero states of an object. Net zero means that the object has already reached a climate performance that can be considered "net zero".
- The definition of "transitioning" needs to change through time to account for the necessary changes in the economy's composition and structure towards reaching net zero. Similarly, the closer we are to 2050, the higher emphasis on net zero (vs transitioning) should be put.
- Careful considerations should be taken when assessing portfolios and FIs exposed to "transition-enabling" counterparties, i.e. counterparties (activities or entities) that sell products and services useful for other counterparties' own transition.

In addition, it is important to remember that consistency or compatibility with the global climate goals is not to be confused with contribution and real-world impact. Assessing 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 [ILB, 2020]. Investing on secondary markets to general purpose instruments may have a more indirect, potentially tenuous

impact, than directly funding a new specific project. A distinction between known and general-purpose instruments, together with key actions financial institutions take for each pocket (e.g. engagement for publicly listed equity) may be useful for an external stakeholder to form a general view on the FIs' contribution potential in that respect.

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 1). 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 and type of FIs [see Green & Vallee, 2022 for an example for banks coal exist policies' effectiveness].

Figure 1 - Examples of investors impact mechanisms and level of evidence [I4CE-ILB, 2021, based on Kolbel 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.

The 2° Investing Initiative report "Collective investor impact in secondary markets" provides an in-depth review, and recommendations, on the effectiveness of two investor impact mechanisms used on secondary markets, namely engagement and price signalling [2° Investing Initiative, 2024].

2.2. Levels of consolidation (financial system levels)

In the CAPA project, the "consolidated level" designates any levels that encompass more than one financial institution. Notably, the perimeter may be only partial, even at the consolidated level - for example, the consolidated assessment may focus on a single asset class (e.g. listed equity) across a group of financial institutions.

Given the object of this research, it is important to segment the financial system into different stylized levels.

1. Counterparty-level (activity or entity);
2. Sector (across one or several asset classes);
3. (Sub)-portfolio (across sectors, across one asset class);
4. Portfolio (across sectors, across several asset classes - within one financial service - e.g. investment portfolio, lending portfolio)
5. Financial institution level – generally across sectors & asset classes – could also be across financial services;
6. Consolidated groups of financial institutions: across one or several sectors, asset classes, financial services.
    - Financial system/centre level (considering organisations that support the functioning of financial markets and their policies/what they do to support the transition - e.g. regulator, central banks etc).

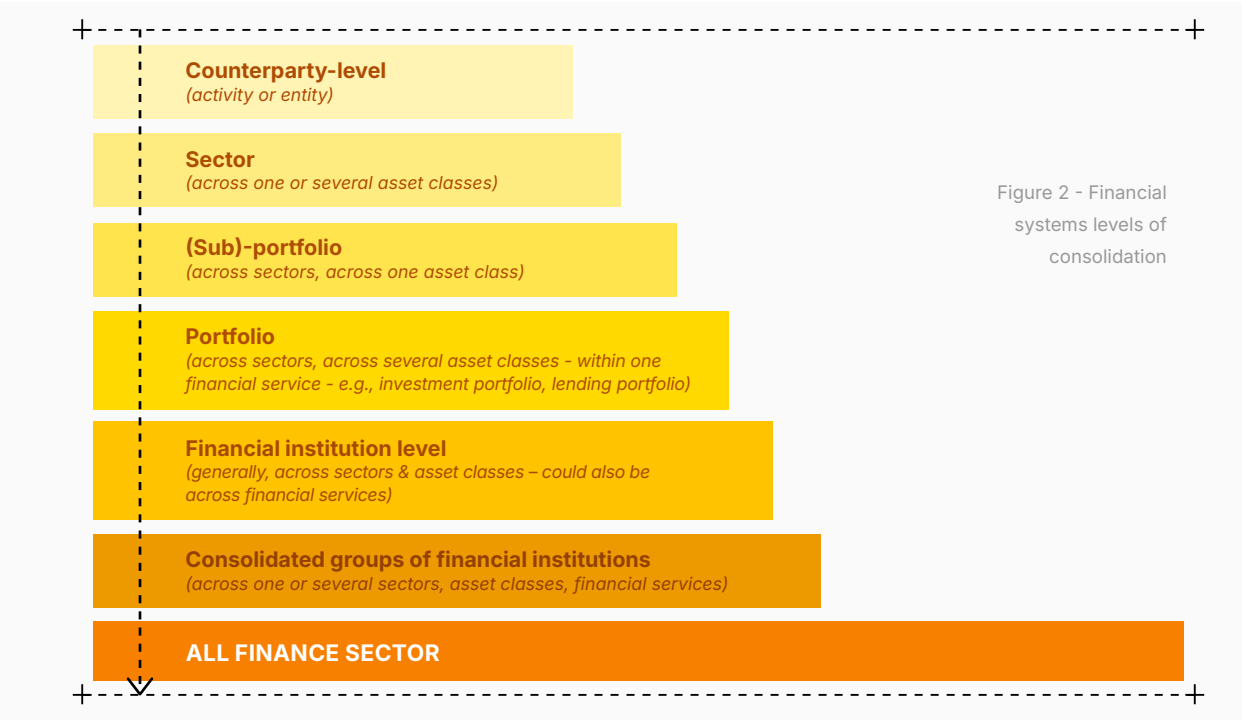


Figure 2 - Financial systems levels of consolidation

Following existing literature, the authors distinguish between the following financial services: **lending, investing (both directly and indirectly), insurance underwriting and capital market activities**. To be noted, one financial institution may perform several types of financial services, and the same financial services can be provided by different types of financial institutions.

2.3. Temporal dimension of alignment

While there is a consensus on the fact that "alignment" is a dynamic concept relating the past, current and/or projected climate performance of an entity (or here a group of entities) with (a) pathway(s) commensurate with the net zero objective, what this "relation" means in practice differs across methodologies. Further complicated for financial institutions given their activities.

Consequently, when attempting to design a consolidated alignment assessment for a group of financial institutions, it is essential to distinguish whether to consider the alignment of their:

1. Current portfolios, including how far the portfolio and its constituents are today from objective and how they behaved in the past;
2. Current portfolios, including projections of how the climate performance of the underlying financial assets is likely to evolve in the future based on their targets and/or other factors;
3. Current and projected portfolios, considering the above and targets set by the financial institutions themselves;
4. Current and projected portfolios, considering the above, and the broader transition plans and approach to net zero that financial institutions take.

Portfolios can be further disaggregated between stocks and annual flows of capital. These can finance, in turn, existing or expansion capacity. Notably, most portfolio alignment methodologies are based on stocks (i.e. the stock of positions at a specific year T rather than new investments) to all types of capacity (existing and expansion). Associated emissions are generally accounted as annual flows of emissions.

This distinction is important in the context of climate-alignment assessments – indeed, in a hypothetical situation where annual flows of capital may be aligned, accumulated stocks may not, because of the past misalignment of annual flows.

Table 1 - Stocks and flows

PORTFOLIOS AND FINANCIAL ASSETS	STOCKS/FLOWS OF CAPITAL	TYPES OF CAPACITY FINANCED	ANNUAL VS CUMULATED FLOWS OF EMISSIONS
• Past, current and or projected portfolios... • Focussing on: Past, current or projected climate performance of underlying financial assets	• Stocks of capital • Annual flows of capital (i.e. new capital flows within the year under consideration)	• Existing capacity • Expansion of capacity	• Cumulated emissions over the life of the investment • Annual flows of emissions

2.4. The multiple facets of alignment

In the authors' view, there are three facets to assessing the consolidated alignment of a group of financial institutions.

Assessing consolidated alignment requires answering the question:

Who finances what for what outcome? [within the chosen group of financial institutions]

As described in sub-section 2.1, alignment assessments combine a range **of inputs** (metrics relating to the climate performance of the object under consideration, scenario metrics) to generate an **alignment outcome metric**.

This report suggests combining three complementary family of approaches defined on the type of input data used to assess the consolidated alignment of a group of financial institutions. Combining these approaches seek to overcome the current limitations/challenges of each individual approach taken in isolation.

• Who provides capital / financial services?

Approaches that use metrics seeking to capture financial institutions transition alignment, or maturity, as a data input to assess the consolidated alignment of a group of financial institutions are implicitly based on the idea that an aligned group of financial institutions is made of aligned financial institutions. There are different ways to assess financial institutions transition alignment and consolidate the results at a higher-level. Section 3 explores this in detail.

FI Transition alignment approaches consist in assessing the alignment of the individual financial institutions within the chosen perimeter and aggregating the resulting metric into a consolidated assessment metric (over a group of financial institutions).

These answer the question: to which extent the chosen group is constituted of aligned financial institutions?

This family of approaches is the simplest amongst all the families reviewed in this report. Perhaps for this reason, it is also the most applied way so far to assess the consolidated alignment of a group of financial institutions.

Indeed, a wide range of existing methodologies are based on this type of approach. These include counting the number of financial institutions' that are signatories to net zero initiatives, or that evaluated by external third-party has having taken a strong approach to net zero, and/or that share a set of predefined characteristics (i.e. have set science-based targets).

Financing alignment approaches aim to measure past, current, and/or future climate-aligned financial stocks and flows and compare it to the level, pace and rate of change expected in relation to the global climate goals.

Financing alignment approaches seek to answer the question: "are financial flows (and resulting stocks) being re-directed adequately in terms of rate and pace towards relevant counterparties in relation to the global climate goals and away from climate-incompatible counterparties"?

The monitoring of financial flows and stocks into "climate-aligned" investments is not a new topic.

Macro-level research in this area has notably been encouraged by Article 2.1.c of the Paris Agreement which calls for "making finance flows consistent with a pathway towards low greenhouse gas (GHG) emissions and climate-resilient development." While there is no clear definition of what exactly it entails, the idea has made its way into private financial institutions' alignment frameworks.

This is partially because 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.

- **What does it finance / provides financial services to?**

Approaches that use financing data as inputs are implicitly based on the idea that an aligned group of financial institutions is a group that provides sufficient financing at the right pace and scale to the right counterparties and away from climate-incompatible counterparties. There are different ways to qualify specific financial flows, stocks and counterparties as aligned and consolidate the results at a higher-level. Section 4 explores this in detail.

• For what outcome?

Approaches that use FI GHG emissions as a data input are implicitly based on the idea that an aligned group of FIs is a group whose emissions linked with its financial activities follow the right pace and scale in terms of decarbonization, as per transition scenarios and pathways. There are different ways to quantify and consolidate emissions related to financial activities at a higher-level and assess their alignment. Section 5 explores this in detail

FI Emissions alignment approaches historically focuses on quantifying the past, current, and/or projected emissions associated with financial institutions' activities ("financed emissions" / "facilitated emissions") and whether these follow the expected trend/respect the limited remaining carbon budget.

This family of approaches focus on the final objective of all climate-related financial efforts: reducing greenhouse gas emissions.

FI Emissions alignment approaches seek to answer the question: "are the emissions associated with financial activities evolving adequately in terms of rate and pace in relation to the global climate goals"?

While these approaches have historically been applied to assess portfolio-level projected emissions alignment, the authors of this report suggest that given some of the methodological limitations it is best used to monitor ex-post emissions alignment as an "accountability" metric.

These three types of approach can be applied to different groups of financial institutions, over different perimeters (see sub-section 2.2) and time horizons (see sub-section 2.3). They can be implemented using a range of data points and specific methodologies. Further, they methodologies can be combined to answer specific research questions relating to different views of what "alignment" means.

Figure 3 - The three facets of consolidated alignment assessments

Who provides capital / financial services?

- **Financial Institution Transition** alignment approaches assess individual FIs to determine if a group of FIs is "aligned."
- These approaches are based on counting "aligned" FIs, defined as such by external stakeholders' transition frameworks and/or using a more limited focus on a specific action, such as adhering to a net zero initiative or getting its target validated by an external body.
- This is a widely used, simple approach to assess consolidated alignment.

To whom?

- **Financing alignment** approaches assess whether stocks and annual flows are being directed at the right pace and scale towards "climate-aligned" assets and away from "climate-incompatible" assets.
- These approaches assess the climate-alignment of financial stocks and flows and compare them to financing and investment scenarios at the consolidated level.
- Inspired by Article 2.1.c of the Paris Agreement, recent strategies aim for real-world impact rather than just reducing emissions associated with portfolios

Outcome

- **Financial Institution Emissions alignment** seek to assess whether the GHG emissions linked to financial activities follow decarbonization scenarios at the consolidated level.
- The approaches focus on quantifying emissions (past, current, and projected) to see if they align with the carbon budget. The authors recommend focusing on past and current emissions as an accountability mechanism.
- **Financial Institution Emissions alignment** approaches are outcome-focused, measuring whether emissions reductions meet climate targets across various FI groups, time horizons, and data methodologies.

2.5. Examples of existing methodologies that seek to assess the consolidated alignment of a group of financial institutions

Table 2 - Summary of examples of existing methodologies for each consolidation approach

CONSOLIDATION APPROACHES	EXAMPLE	EXAMPLE - DESCRIPTION
FI Transition alignment	Net Zero Initiatives [GFANZ, 2023]; NZAOA, 2023; NZBA, 2023, 2024]	Net-zero initiatives, such as GFANZ and its sub-alliances (e.g., NZAOA, NZBA), assess the consolidated alignment of financial institutions by aggregating progress metrics in their reports. These metrics primarily focus on counting institutions with net-zero commitments and, in some cases, evaluating associated financial values.
	The Global Stocktake [UNFCCC, 2023; UNFCCC. SCF, 2022]	The Global Stocktake (GST), established by the Paris Agreement, assesses collective progress toward climate goals, including financial sector alignment with Article 2.1(c). It aggregates metrics on financial initiatives' scale and volume, along with public and private climate finance flows, while emphasizing the need for enhanced transparency and comparability in approaches.
	Net Zero Donut [SFO, 2023]	The Net Zero Donut tool, developed by the Sustainable Finance Observatory, evaluates financial institutions' transition plans using over 170 indicators from net-zero initiatives, reference frameworks, and reporting standards. It individually assesses governance, strategies, engagement, and climate metrics, with annual expert reviews ensuring continuous improvement. In 2023, the tool calculated average alignment scores for banks, asset owners, and managers, applying equal weighting across institutions.
	CPI – NZFT [CPI, 2024]	The Net Zero Finance Tracker (NZFT) by CPI assesses GFANZ members' net-zero commitments across Targets, Implementation, and Impact, evaluating policies, financial flows, and financed emissions. Results are categorized by action level and can be consolidated by count or value metrics, linking commitments to real-economy outcomes.
	TPI – NZBAF [TPI, 2024]	The Transition Pathway Initiative's 2024 Net Zero Banking Assessment Framework (NZBAF) evaluates 26 banks' low-carbon transition readiness using 72 sub-indicators across 10 areas, such as targets and decarbonization strategies. Each bank receives a consolidated score (0-100), with group results showing banks meet an average of 20% of the indicators.
	ACT Finance [ACT Finance, 2024a & 2024b]	The ACT Finance methodology comprises 8 modules to assess the strength of an FI transition: Targets (Module 1), Intangible investment (Module 3), Portfolio Climate performance (Module 4), Management (Module 5), Investors/Savers engagement (Module 6), Investees/Clients engagement (Module 7), Policy engagement (Module 8), Business model (Module 9). While designed for FI-level assessments, its weighting principles could be adapted for consolidated alignment evaluations of multiple institutions.

Financing alignment	CPI [2023]	CPI estimates annual green financing flows at USD 1.27 trillion for 2021-2022, focusing on primary investments and excluding secondary market transactions. It consolidates data globally across sectors and financial instruments but does not assess whether climate finance grows at the needed scale. CPI's NZFT adds an impact dimension, measuring how financial flows support or hinder the net-zero transition, including metrics like clean energy financing, fossil fuel exposure, and portfolio emissions.
	EU Sustainable Platform [PSF, 2024]	The EU is developing a framework to monitor the alignment of financial flows with its net-zero targets, focusing on private capital expenditures and capital market flows. It includes data on loans, green bonds, SFDR funds, and general-purpose financing instruments, covering both primary and secondary flows.
	PACTA COP [2° Investing Initiative, 2021]	The PACTA COP program measures financial sector alignment with climate goals, using a bottom-up analysis of physical assets' capacity and production in key sectors. Consolidated at the corporate and portfolio-levels, it provides a five-year forward-looking assessment based on current portfolio composition but excludes financial institutions' targets or strategies.
	ACT Finance [ACT Finance, 2024a & 2024b]	The ACT Finance methodology comprises modules to assess financial flows and stocks alignment: Engagement Targets (evaluating fossil fuel policies and counterparty engagement quality), Financing Targets (measuring the robustness of climate financing roadmaps), and Financial Flow Trend (analysing trends in financing counterparties in transition, relative to targets for 2030/2050). While designed for FI-level assessments, its weighting principles could be adapted for consolidated alignment evaluations of multiple institutions.
	Reclaim Finance	Multiple methodologies to track fossil fuel financing, such as Banking on Climate Chaos Report (BOCC) [2024], Coal Policy Tracker [2024], Oil and Gas Policy Tracker [2024], and the Sustainable Power Policy Tracker [2024]. While designed for FI-level assessments, its weighting principles could be adapted for consolidated alignment evaluations of multiple institutions.
FI Emissions alignment	NZAOA Progress report [2024]	The NZAOA's progress report assesses the consolidated alignment of its members by aggregating financed emissions data, tracking absolute reductions over time as a key alignment metric. Emissions are grouped into cohorts based on reporting start years, enabling detailed trend analysis across the Alliance. Annual reductions of at least 6%—achieved through portfolio reallocations toward sustainable investments—demonstrate alignment with a 1.5°C pathway, despite variations influenced by external factors.
	I-PEPs [GFA, 2024]	The I-PEPs approach assesses financial institutions' alignment by aggregating portfolio-weighted emissions metrics. Using absolute emissions for corporate assets and intensity for project finance, it weights emissions by portfolio share, consolidating them at sub-asset class and portfolio-wide levels. The resulting Aggregated Portfolio-weighted Emission Performance (APEP) provides a clear metric to track decarbonization progress and alignment with climate goals.
	CPI – NZFT [2024]	The CPI's Net Zero Finance Tracker (NZFT) assesses the impact of financial institutions on the real economy through metrics like "portfolio emissions", measuring financed emissions at both individual and group levels. Using reported, interpolated, and estimated data, the NZFT consolidates emissions while maintaining transparency by segmenting data types and presenting boundary values for aggregated figures. However, with only 19% of institutions in the 2023 sample covered, challenges like double counting across data types persist, and the aggregation methodology remains under development.

2.6. Suggested approach to assess the consolidated alignment of a group of financial institutions

In the authors' view, a robust consolidated alignment assessment methodology should:

- Ensure that the results are sensitive to the meaningful actions and strategies taken by financial institutions, and in tune with real-world decarbonization trends;
- Incorporate bottom-up, disclosed data in a meaningful and science-based way;
- Reconcile the micro and macro level, notably, through considering the macro financing gaps and the remaining global carbon budget.
- Establish links between the different levels of the financial systems – and operate at any chosen level by the methodology user.
- Incorporate a wide definition of alignment, with a full economy view, from green/net zero/ enabling to transitioning to incompatible assets.

No single approach discussed in sub-section 2.6 currently tick all the boxes above at the current state of research – consequently the authors recommend a dashboard approach focussing on the different facets of alignment identified to answer the question: who finances what for what outcome?

Complementary between the three approaches

FI Transition alignment approaches can be seen as complementary to *Financing* and *FI Emissions alignment approaches*, as they focus on the characteristics of the financial institution in relation to the transition, beyond its financed/facilitated emissions and the nature of its financing. Indeed, most of the methodologies based on this approach integrate considerations relating to the strategy and internal processes put in place by financial institutions to pilot the transition.

Yet, while *FI Transition alignment approaches* often integrate elements relating to the past, present and future emissions performance of financial institutions, few integrate an *independent, quantitative* assessment of whether financial institutions' emissions are aligned with a decarbonization scenario or whether FI's provide sufficient financing to climate-aligned assets. In addition, the underlying data is often not available (or presented in a way that allows...) to consolidate financing and emissions data for a group of financial institutions and assess alignment at this level of aggregation.

Recommended by some frameworks (SBTi FINZ climate alignment targets [2024], IIGCC asset class targets [2024] and ACT Finance assessment of Financing and engagement targets, and financial flow trends [2024], UNEP "Developing Metrics for Transition Finance", [2023]), "climate-aligned" (and unaligned) financial flows and stocks metrics and targets are increasingly seen as useful to pilot the transition, together with emissions' metrics. The latter are increasingly seen as an accountability, ex-post monitoring tool – ensuring that the reorientation of financial flows leads actually to the right level of decarbonization.

Indeed, while *FI Transition alignment approaches* assess the transition-readiness of financial institutions, and *Financing alignment approaches* measure how financial flows are being redirected toward climate-aligned investments, *FI emissions alignment approaches* seek to capture how the emissions linked to these financial activities evolve through time and compare to a given budget. While these approaches have historically been applied at individual portfolio-level to assess the alignment of projected emissions, the authors of this report argue that they are best used to assess ex-post emissions' alignment, as an accountability tool, as part of consolidated alignments.

Real economy, measurable reductions in emissions is fundamental to ensuring that transition efforts contribute to global climate targets. This family of approaches complements the *FI Transition alignment* and *Financing alignment approaches* by focusing on their expected outcome.

Table 3 below lists the potential consolidated alignment output metrics for each family of approaches.

The column "ideal metric" refers to what the alignment output metric would be expected to be for the group of financial institutions under assessment to be considered aligned.

Best practices to implement each family of approach are detailed in the table and the next sections.

Table 3 - Summary of key alignment approaches selected to assess the consolidated alignment of a group of FIs

APPROACH	POTENTIAL CONSOLIDATED ALIGNMENT OUTPUT METRIC	IDEAL METRIC	KEY METHODOLOGICAL QUESTIONS	RECOMMENDED BEST PRACTICES (AUTHORS' OPINION)
FI Transition alignment	% of FIs, AUMs (or financial assets, gross written premiums, other relevant metric) or climate-weighted AUMs with credible transition plans	100% by 2030 at the latest	How to assess the robustness of an FI transition plan? What metric to use to consolidate the results (%, financial metric, additional weighting)	• Cover the relevant asset classes and activities within the alignment scope. • Assess FI alignment through different dimensions (e.g. governance, strategy, engagement, emissions, financial flows and stocks, actions taken…). • Integrate both absolute and relative financing metrics to climate solution, credibly-transitioning and incompatible assets • Adopt a clear policy to restrict financial services to fossil fuels, and end support to development of new production capacity. • Integrate an assessment of whether the FIs are actively monitoring their emissions' trends and seeking to attribute changes to different factors, including real-world decarbonization (vs effects attributable to changes in economic variables). • Apply a maturity scale approach for assessments and provide raw data for coherent integration.
Financing alignment	% & value of stocks and new flows aligned – if possible disaggregated between types of financial services, asset classes (general vs specific use of proceeds), sector and/or geography. Ratio of aligned vs misa-ligned stocks and flows. % & value of stocks and flows incompatible with the transition.	100% classified as "transitioning" by 2030 (in transition or solutions); 100% classified as "net zero" by 2050 at the latest; specific benchmarks for "value" metrics	How to assess the alignment of specific financial stocks and flows (instruments, final counterparties)? How to consolidate the results across multiple types of stocks and flows?	• Assess flows and stocks to enablers, net-zero-achieved, transitioning and incompatible counterparties (entities and/or activities). • Integrate both stocks and flows of capital, using absolute and relative metrics for a comprehensive view. • Segment results between stocks and flows, by financial service and asset class, distinguishing between known and unknown use of proceeds instruments. • Adopt a ratio of aligned vs misaligned/ incompatible stocks and flows
FI Emissions alignment	Emissions linked to financial activities and trend over the past years.	Ex-post/ex-ante alignment with a pathway/scenario	How to consolidate emissions beyond specific asset classes, financial services, financial institutions? How to assess alignment, given the difficulties arising from multiple counting?	• Focus on assessing ex-post emissions alignment (decarbonization trends); • Use reported emissions data when possible and comparable; estimates as needed. • For alignment assessment, use unattributed emissions to avoid the distorting effect of allocation based on financial metrics or use attributed emissions while making sure that the distorting effect of attribution is clearly identified. • Conduct trend analysis compared to sector-specific scenarios (and if relevant geography-specific), focusing on ex-post monitoring for accountability purposes. • Segment emissions data by financial service and asset class, distinguishing known and unknown use of proceeds instruments.

Notably, the authors suggest keeping the consolidated alignment outcome metrics for the three approaches disaggregated rather than seeking to consolidate them into a single score, to enhance transparency.

In addition, the authors recognize that there is no single alignment approach that exist across asset classes, let alone financial services. **In particular, the authors suggest keeping the results of the *Financing* and *FI Emissions alignment approaches* disaggregated between financial services and asset classes – or at minimum between use of proceeds and general-purpose instruments**.

This serves to acknowledge that:

- Different financial services and asset classes can have different impact potentials and channels;
- All asset classes and financial instruments should be on the right path to net zero in an aligned economy – the "over" alignment of one asset class cannot compensate for the "under" alignment of another.

2.7. The road ahead

As highlighted in table 3, the authors formulate specific methodological recommendations to ensure that each approach effectively meets consolidated alignment objectives while maintaining transparency.

2.7.1. FI Transition alignment approaches

In the authors' view, one can distinguish the following steps to implement *FI Transition alignment approaches*:

1. Assess the alignment of individual financial institutions;
2. Aggregate the financial institutions' alignment results in step 1 within the pre-determined perimeter (e.g. all asset managers in Europe) and derive a consolidated alignment metric for the group of financial institutions under consideration.

The chosen methodology to assess the alignment of individual financial institutions (step 1) should encompass all the necessary asset classes and activities as defined within the scope of the consolidated alignment. Additionally, the integration of recommendations from prominent frameworks is best to maintain consistency with established best practices.

A credible assessment of a financial institution's transition maturity and approach to net zero requires a thorough evaluation of qualitative data, including disclosure of targets, as well as perimeter-specific information that reflects emerging best practices, such as target types and coverage areas.

To strengthen this evaluation, quantitative assessments from third-party sources can provide valuable insights, as demonstrated in assessments like the ATP-CoI report from the World Benchmarking Alliance [2024].

It is also essential to incorporate financing metrics in both absolute and relative terms, as well as, address both accumulated financial flows and new capital flows, assessing alignment for both existing and expansionary investments to ensure that commitments to new projects are equally in line with transition objectives. At minimum, financial services, as well specific and general use of proceeds instruments should be evaluated independently.

Moreover, the methodology should include an a**ssessment of whether the FIs are actively monitoring the ex-post effect on their emissions, and seeking to attribute change to different factors, including real-world decarbonization (vs effects attributable to changes in economic variables)**.

Wherever feasible, raw underlying data should be made available to facilitate streamlined integration with other approaches. For broader thematic assessments, a maturity scale approach may be preferable over traditional weighting methods, as it more accurately captures varying degrees of alignment maturity.

Finally, it is likely better to consolidate the individual financial institutions' transition alignment results at the consolidated group-level by weighting the results using financial value and emissions, where possible. This strategy ensures that the results reflect both the scale of financial commitments and their potential climate impact accurately.

THE EMERGENCE OF MATURITY SCALE APPROACHES IN ASSESSING THE CLIMATE PERFORMANCE OF FINANCIAL ASSETS, AND INSTITUTIONS

The financial sector is witnessing a significant evolution in its approach to assessing the climate alignment of financial institutions and their assets. Increasingly, maturity scales—structured frameworks that classify assets or institutions into predefined stages of climate alignment—are being favoured over complex weighting systems. This shift reflects a growing consensus among stakeholders that maturity scales provide greater transparency, adaptability, and practical utility in assessing progress toward global climate goals. This section explores the rationale behind this trend, the relative strengths and weaknesses of each approach, and why maturity scales are becoming the preferred approach.

Maturity scales simplify the process of assessing climate alignment by categorising financial assets or institutions into distinct alignment stages. For instance, the Net Zero Investment Framework (NZIF) [2021, 2024] uses a five-category maturity scale, such as "Achieved Net Zero", "Aligned", "Aligning", "Committed to Aligning", and "Not Aligned", enabling investors to evaluate their portfolios' alignment progressively and

systematically. These stages are defined using a clear set of criteria, which typically include attributes such as emissions targets, transition plans, and performance relative to net-zero pathways. Other examples of maturity scales can be found in the GFANZ [2023] 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 NetZero Financing & Investment [2023].

A key feature of maturity scales is their checklist-based methodology, where the position of a financial asset or financial institution on the scale depends on the cumulative evaluation of a range of indicators. Each indicator—whether positive or negative—contributes to the assessment, providing a structured inventory of alignment attributes. This contrasts with weighting systems, which often rely on subjective judgments to prioritize certain factors over others and may result in many financial assets/institutions with widely different characteristics being rated as "average".

The transparency of maturity scales is one of their main advantages. This clarity makes it easier for stakeholders to understand an institution's position in the transition and identify actionable next steps. Furthermore, maturity scales are inherently adaptable to evolving standards and practices. Unlike weighting systems, which require frequent recalibration as priorities shift, maturity scales can accommodate change by refining the criteria for each category rather than overhauling the entire framework.

However, maturity scales are not without limitations. While they excel in providing a structured overview, they may lack the granularity needed to capture subtle differences between assets or institutions. For instance, two institutions within the same alignment category might differ significantly in their detailed transition strategies, which the scale alone may not adequately reflect. To mitigate this, robust frameworks and transparent methodologies are essential to ensure consistency and comparability across classifications.

Today, multiple maturity scale approaches are being developed, each with different maturity categories, indicators, and recommended methods for assessing these indicators. This diversity reflects the range of needs and contexts in which these tools are applied. However, it also creates challenges in harmonizing these systems. Building bridges between maturity scales to ensure consistency and comparability across frameworks is critical for fostering a coherent understanding of climate alignment in the financial sector.

Another important consideration is the extent to which a categorization system aligns with climate targets, decarbonization trajectories, and broader global climate goals. A maturity scale's relevance and effectiveness depend on how well its indicators and categories reflect progress toward these objectives.

These challenges highlight the need for research to harmonize maturity scales and evaluate how this tool can effectively guide the financial sector's transition toward global climate goals.

2.7.2. Financing alignment approaches

In the authors' view, one can distinguish the following steps to implement *Financing alignment approaches*:

1. Define how to categorise financial flows and stocks into alignment categories, and in particular what climate-aligned financial flows and stocks, and counterparties means;
2. Quantify current (and potentially project) the alignment of financial flows and stocks;
3. Derive benchmark(s) for the alignment of financial flows and stocks through time and assess alignment;
4. Aggregate the results at the desired level of consolidation (e.g. pre-defined group of financial institution).

To ensure that consolidated assessments that use a *Financing alignment approach* effectively gauge whether financial flows are directed toward climate-aligned activities, several best practices exist in the authors' view. **First, the assessment should encompass financial flows and stocks directed toward four main types of counterparties: enablers of the transition, net-zero-achieved entities, those that are actively and credibly transitioning and incompatible entities**.

The inclusion of both stocks and flows in the assessment is crucial to capture the full spectrum of financial commitments, encompassing both accumulated investments and new, annual flows. It is also essential to integrate both absolute and relative metrics. This dual approach captures the overall magnitude of climate-aligned financial flows and stocks while also reflecting their proportional alignment relative to other flows. Beyond static green and brown designations, the assessment should account for transitioning counterparties, as this offers a more dynamic perspective of alignment progress across different stages of transition.

To deepen the understanding of the link between financial services and real-world impacts, results should be segmented according to the type of financial service and asset class, with special attention to whether the proceeds are known or unknown. This segmentation provides a more nuanced insight into the impact of various financial services.

GREEN/BROWN RATIO: A TOOL FOR ASSESSING AND STEERING THE FINANCING OF THE LOW-CARBON ECONOMY.

The "green-to-brown ratio" is defined as the proportion of financing allocated to so-called green or clean activities compared to those dedicated to high-carbon activities. This indicator is gaining traction among financial actors and is particularly appreciated by academic and civil society stakeholders. This last two groups argue that it is not so much the sum of the trillions of dollars and euros mobilised in favour of the green

economy that matters most for achieving climate objectives, but rather the ratio between green and brown financing, in the same way that the chances of success of a diet cannot be assessed by counting only the consumption of good calories such as vegetables, without taking into account bad ones such as ice cream.

A very useful sub-indicator of the green-to-brown ratio is the Energy Supply Ratio (ESR), developed by Bloomberg NEF over the past few years. This ESR ratio is gaining notoriety on the markets due to its highly relevant focus on the energy sector, which accounts for almost three quarters of global emissions, with a heavy dependence on fossil fuels that still represent 83% of global consumption, the same level as half a century ago; a statistic that reveals the level of addiction of the global economy and the need to accurately measure the financing of the expected decoupling. This ratio, based solely on financial flows, is adjusted to dynamically reflect the actual share of green or brown activities within the companies financed.

This emerging tool does, however, have a number of limitations: incomplete data, no direct link with emissions reduction, and difficulty in including certain hybrid technologies. Above all, it calls for a number of methodological adjustments to enhance its relevance. A first area for improvement would be better harmonization of the definitions of green and brown energies, and the integration of “Do No Significant Harm” (DNSH) criteria inspired by the European taxonomy, which would make it possible to avoid the potential negative impacts of “green” investments; at the same time, the approach could be enriched by associating ESR with concrete impact measurements, such as the proportion of financing allocated to EMDE countries.. A second area for improvement is to ensure comprehensive coverage of financing activities within retail and investment banking, for example by capturing emerging trends in origination and financing.

Such a ratio analysing the financing of energy supply (Supply) could be complemented by a second ratio dedicated to financial flows devoted to energy demand, assessing banks’ financing efforts directed towards end-use consumption, notably energy efficiency and end-uses (buildings, transport, industry). Combining these two approaches would provide us with a comprehensive vision for assessing and steering the financing of the energy transition.

The main advantage of promoting this family of ratios is that they provide a target value, enabling all stakeholders to gauge the level of financing effort being made by the banks, and the latter to calibrate their financing objectives. The IEA’s World Energy Investment 2024 report indicates that green financing has exceeded USD 2,000 billion, although it should be pointed out that this represents only 1.8 times the volume of financing dedicated to fossil fuels, a ratio which, according to the IEA, must be increased to 6:1 by 2030 if its NZE scenario is to be achieved. Here is a new indicator that is as precise as it is measurable and - unlike most others - very easy to consolidate: it is much simpler and more concrete to aggregate dollars, yuan and euros than decarbonization trajectories of financial institutions; an essential guarantee of reliability, comparability and credibility for climate commitments and undoubtedly the best substitute at a time when many coalitions are seeking to distance themselves from net-zero decarbonization trajectories.

2.7.3. FI Emissions alignment approaches

In the authors' view, one can distinguish the following steps to implement *FI Emissions alignment approaches*:

1. Quantify (past and/or current) emissions related to financial institutions' services;
2. Project emissions data (optional);
3. Consolidate emissions data at the desired level of aggregation and assess alignment with decarbonization pathways.

To advance assessments following *FI Emissions alignment approaches*, certain key actions can enhance robustness and transparency. First, the authors suggest that in the context of consolidated alignment assessments it is strictly applied to ex-post emissions monitoring rather than to assess targeted/projected emissions. **The preferred approach is to rely on emissions data reported directly by financial institutions, while first checking that it is comparable**. When direct reporting is unavailable, alternative estimation methods can be employed to reliably fill any data gaps.

***FI Emissions alignment assessments* may be conducted using trend analysis, comparing the absolute unattributed emissions footprint to an alignment scenario, ideally one that considers geographic or sector-specific factors**. This trend analysis should be supplemented by weighted emissions intensity per unit of production, such as through the Sectoral Decarbonization Approach (SDA), to capture the nuanced relationship between financial flows and stocks and emissions. **Ex-post monitoring should be prioritized to enhance accountability as well as attribution analysis, as it provides a tangible record of emissions reductions achieved over time**.

EMISSIONS PERFORMANCE QUANTIFICATION FOR REAL-WORLD IMPACT MONITORING – EMERGING APPROACHES

Historically, emissions accounting approaches have been built on one of two principles. The Weighted Average Intensity (WACI), advocated by risk-based frameworks such as the TCFD, builds a weighted average of the emissions intensity (normalized by a monetary metric, such as revenue) of the financial assets within a portfolio using portfolio weighted. The financed emissions approach, promoted notably by PCAF, attributes a share of an asset's emissions to a portfolio based on the ownership principle, using attribution factors.

The use of attribution factors commonly employed by financial institutions to calculate their financed emissions has been widely debated. Attributed emissions are subject to significant volatility introduced by these monetary attribution factors [Granoff, Ilmi & Lee, Tonya,

2024], which were initially designed to provide an "accounting" representation of the actual emissions generated by financial institutions' activities. These factors are often based on financial or accounting indicators such as EVIC, Market Capitalization, or Book Value.

In particular, this volatility generates "noise" that complicates the use of the financed emissions metric in target-setting and monitoring.

Monitoring historical emission trends retrospectively is expected to gain importance in the coming years, particularly for assessing whether financial institutions contribute to real-world decarbonization. As the topic of ex-post emissions reduction (or increase) monitoring takes center plan in climate discussions several alternative approaches to calculating the emissions associated with a financial institution's activities have recently emerged for this particular use case.

The first approach involves removing financial variables traditionally used to allocate emissions to a portfolio by relying on portfolio weighting approaches and extending the WACI logic to other emissions metric (physical intensity and absolute emissions).

The WAPI methodology (Weighted Average Physical Intensity), such as proposed by Reclaim Finance [2024] and implemented by several banks, eliminates the need for normalization through attribution factors by weighting the physical intensity of underlying assets according to the financial exposure of the sectoral portfolio to each asset. This allows a less distorted assessment of portfolio emissions overtime.

Similarly, the IPEPS methodology (Indicators for Portfolio-weighted Emission Performances), introduced by the Green Finance Alliance [2024], also avoids attribution by weighting the absolute emissions of financial assets on the financial exposure of the portfolio to each asset. Since this approach weighs absolute emissions by portfolio share rather than attributing them, it may result in outputs that do not accurately reflect the financial institution's specific contribution to the emissions of a given entity. Yet, it is important to note that the resulting portfolio-level metric is not intended to be used as an accounting tool – but rather to be embedded within a year-on-year emissions performance change assessment.

The Theia Lab report "We were wrong" [2024] provides a detailed review of the pros and cons of the IPEPS methodology within the context of target-setting.

A second approach involves the ex-post evaluation of financed emissions, incorporating an attribution analysis to understand the factors driving variations.

According to many actors [MSCI, 2023; NZAOA, 2023; IIGCC, 2024; Bouchet, 2024], tracking the evolution of financed emissions requires a comprehensive analysis of the different drivers influencing year-to-year changes, whether positive or negative. For instance, Bouchet [2024] identifies four primary categories of drivers across various attribution assessment frameworks: i) data coverage, ii) portfolio reallocation, iii) company emissions, and iv) economic and financial fluctuations. This last factor is particularly important, as it assesses the influence of attribution factors introduced by fluctuations in financial metrics—such as EVIC—on the evolution of a financial institution's emissions.

Consequently, where financial institutions prefer to continue using attributed financed emissions for monitoring purposes, attribution analysis becomes even more important to understand what drives year-on-year changes and differentiate "paper decarbonization" from "real world emissions changes".

Notably, even when using weighted emissions metrics such as the WAPI or the metrics promoted by the IPEP methodology (see above), attribution analysis may still be relevant to understand what drives emissions performance change through time. Indeed, while financial volatility will not be one of these drivers, all the other drivers used in attribution analysis frameworks remain relevant.

As a conclusion, further research is needed to ensure that carbon performance metrics are more relevant for piloting and monitoring real-world decarbonization by financial institutions, with additional clarity required on how these approaches can comprehensively address both impact and risk dimensions.

2.7.4. Future research areas for developing consolidated alignment assessment

Future research should focus on establishing the essential building blocks of a consolidated alignment assessment to improve accuracy and address current methodological biases. An integrated approach that combines *FI Transition alignment approaches* with *Financing alignment* and *FI emissions alignment approaches* could help correct for biases in existing methodologies, as suggested in this report.

One important area of investigation is the harmonization of portfolio emissions targets set across varying levels, perimeters, time horizons, and units to ensure a cohesive assessment of collective trajectories. Achieving this harmonization requires comprehensive data on emissions targets and the development of scientifically robust rules that are consistent with the global carbon budget.

Another key research need involves integrating financing, alignment and emissions targets, as there is currently no standard conversion methodology to estimate projected emissions based on financing flows. To address this, a possible interim solution could involve analysing only the targeted emissions of financial institutions that have set specific portfolio alignment and financing goals.

Additionally, future research should aim to distinguish real-world emissions reductions from "virtual" reductions. To do this, it will be necessary to develop granular tools capable of assessing whether financial institution targets are likely to produce genuine decarbonization or simply a reallocation of emissions. This entails both ex-ante and ex-post assessments, along with evaluations

of transition plans and consideration of the “critical mass” concept—whether widespread net-zero commitments across institutions reduce financing for non-decarbonized assets.

Further research is also required to develop methodologies for aggregating projected emissions across asset classes and financial activities. This aggregation process will need to consider the varying levels of influence that financial institutions can exert, as well as data availability and potential double-counting risks, to provide a coherent and accurate consolidated emissions projection.

Finally, there is a pressing need to devise methods for projecting emissions in cases where institutions lack disclosures, particularly regarding targets. Filling these blind spots will be essential to ensure that consolidated alignment assessments are comprehensive and reflective of all relevant data.

PART 02

ASSESSING THE CONSOLIDATED ALIGNMENT OF A GROUP OF FINANCIAL INSTITUTIONS

TECHNICAL DEEP-DIVES

This sect on explores in detail each family of approaches presented in Part 1

3. DEVELOPING FI TRANSITION ALIGNMENT APPROACHES TO ASSESS THE CONSOLIDATED ALIGNMENT OF A GROUP OF FINANCIAL INSTITUTIONS

3.1. What are FI Transition alignment approaches and why are they important?

FI Transition alignment approaches consist in assessing the alignment of the individual financial institutions within the chosen perimeter and aggregating the output to derive a consolidated assessment for a group of financial institutions.

These answer the question: to which extent the chosen group is constituted of aligned financial institutions?

This family of approaches is the simplest amongst all the families reviewed in this report. Perhaps for this reason, it is also the most applied way so far to assess the consolidated alignment of a group of financial institutions.

Indeed, a wide range of existing methodologies are based on this type of approach. These include counting the number of financial institutions' that are signatories to net zero initiatives, or that evaluated by external third-party has having taken a strong approach to net zero, and/or that share a set of predefined characteristics (i.e. have set science-based targets).

***FI Transition alignment approaches* can be seen as complementary to the *Financing*, and *FI Emissions alignment approaches*, as they focus on the characteristics of the financial institution in relation to the transition, beyond its financed/facilitated emissions and the nature of its financing.**

- Most of the methodologies based on this type of approach integrate considerations relating to the strategy and internal processes put in place by financial institutions to pilot the transition.
- While *FI Transition alignment approaches* often integrate elements relating to the past, present and future emissions performance of financial institutions, they seldom integrate an independent, quantitative assessment of whether financial institutions' emissions are aligned with a decarbonization scenario or whether financial institutions provide sufficient financing to climate-aligned assets.

3.2. How are FI Transition alignment approaches built?

In the authors' view, one can distinguish the following steps to implement *FI Transition alignment approaches*:

1. Assess the alignment of individual financial institutions;
2. Aggregate the financial institutions' alignment results in step 1 within the pre-determined perimeter (e.g. all asset managers in Europe) and derive a consolidated alignment metric.

Figure 4 - Summary of keys steps to implement FI Transition alignment approaches

FI TRANSITION ALIGNMENT APPROACHES

STEP 1 ASSESS THE ALIGNMENT OF INDIVIDUAL FIS

1. Define alignment for an FI

Base your assessment of alignment frameworks, such as:

- **Expert-led** and industry guidance (e.g., UN High-Level Expert Group)
- **Voluntary** disclosure frameworks (e.g., TCFD)
- **Regulatory** requirements (e.g., ESG disclosures)

Make sure to include key themes in your assessment, such as:

- **Commitment to net-zero targets**
- **Robust plans and strategies**
- **Internal integration, monitoring, and transparent disclosure**
- **Financial effective reallocation of financial stocks and flows towards climate-aligned counterparties and instruments**
- **Engagement policy and practices**
- **Criteria to exclude activities misaligned with the transition, following DNSH logic**
- **Explicit fossil fuel policies, including bans on new fossil fuel production**

2. Choose data points to classify Fis as "aligned"

Select the data points/methodologies to use to assess FI alignment, such as:

- **Signatory of Net Zero initiative** (e.g., NZAOA, NZBA)
  Number of FIs signed to NZBA with disclosed targets
- **Validated science-based targets** (e.g., SBTi)
  Percentage of FIs with SBTi-approved targets
- **External assessments by third parties** (e.g., ACT, TPI, CDP)
  Ratings based on external evaluations (aligned, aligning, not aligned)
- **Proprietary/private vendors' methodology**
  Proprietary scores showing levels of alignment

STEP 2 AGGREGATE FIS' ALIGNMENT RESULTS & DERIVE A CONSOLIDATED METRIC

1. Choose an aggregation variable

- **Count of FIs**: *number of aligned FIs within a region or sector*
- **Financial metric**: *total AuM of aligned FIs*
- **Emissions metric**: *total emissions reduction from aligned FIs' portfolios*

2. Choose an aggregation method

- **Averaging** (weighted or unweighted): *average alignment scores for a group of FIs (e.g., banks, AM, AO)*
- **Coverage metric**: *% or number of FIs that are aligned*

CONSOLIDATED FI TRANSITION ALIGNMENT

STEP 1

ASSESS THE ALIGNMENT OF INDIVIDUAL FINANCIAL INSTITUTIONS

The first step is to determine what it means for a financial institution to be "aligned".

One could seek the answer in the wide range of voluntary and regulatory frameworks that exist to guide financial institutions through their alignment journey.

Different types of frameworks exist. They encompass 1. expert-led and industry guidance frameworks, such as the UN's High-Level Expert Group recommendations, which provide strategic direction for alignment; 2. voluntary disclosure frameworks like the TCFD, which emphasise reporting on climate-related risks and transition plans; and 3. regulatory requirements, which mandate disclosures on environmental, social, and governance (ESG) topics, including alignment and target-setting [ILB, 2024].

These frameworks usually cover multiple dimensions. Financial institutions are generally expected to take high-level commitment to net-zero targets, set specific time-bound targets and develop robust plans and strategies. They must embed these into their organisational processes, monitor progress, and disclose it transparently.

The variability in recommendations and prescriptiveness across different frameworks has led financial institutions to implement diverse practices. This complicates efforts to consistently assess whether financial institutions are "aligned", according to a single, universal definition.

- For example, while the number of financial institutions setting net-zero targets is growing, there is no clear agreement on how to define or measure their "fair share" of global climate efforts. The flexibility in target-setting allows institutions to adopt a variety of approaches: targets may differ in terms of their scope, assumptions, and timelines, making it difficult to compare institutions or ensure that all are contributing adequately to the global climate goals at the macro-level.

- Another issue is the robustness of transition plans. Many financial institutions commit to net-zero goals without having comprehensive or detailed plans in place to achieve them. Similarly, transition plans may vary in terms of content, details and ultimately credibility. The absence of standardised methods to evaluate these transition plans adds uncertainty about how effective these commitments are in reducing emissions and aligning with global climate targets.

Consequently, several methodologies have been developed to operationalize these guidelines and ultimately assess whether an FI can be considered "aligned".

Based on these existing frameworks and methodologies, one can choose amongst a range of data points to classify a financial institution as "aligned". These include, but are not limited to:

- Whether the financial institution is a signatory of a Net Zero initiative: *e.g. Net Zero Asset Owner Alliance (NZAOA), Net Zero Banking Alliance (NZBA), Paris Aligned Investment Initiative (PAII)*;
- Whether the financial institution has a validated science-based targets: *e.g. Science Based Target Initiative (SBTi)*;
- Whether the financial institution is assessed as "aligned" by external stakeholders: *e.g. Accelerate Climate Transition (ACT), Transition Pathway Initiative (TPI), InfluenceMap (IM), Climate Policy Initiative (CPI), Net Zero Donut from Sustainable Finance Observatory (SFO), Net Zero Alignment Dataset (NZAD) from Carbon Disclosure Project (CDP)*;
- Whether the financial institution is assessed as "aligned" based on a proprietary/private vendors' methodology.

Table 4 - Overview of pros and cons for different data source options to classify an FI as aligned

DATA SOURCE	PROS	CONS
Signatory of a net zero initiative	• Easy to implement. • NZ initiatives have requirements concerning a wide range of themes, including but not limited to governance, target-setting and strategy.	• Being a signatory is no guarantee that the FI follows the guidelines: substantiality of these commitments, as some initiatives may lack enforceable measures to drive meaningful change. • Divergence, different levels of stringency & demands between different initiatives applying to same actors. • FIs can be acting without being a signatory to net zero initiatives. • FIs can exit initiatives whenever they wish.
SBTi validated targets	• Easy to implement. • Latest Financial Institutions Net-Zero [FINZ, 2024] focus on themes larger than target-setting. • Binary indicator. • Harmonised.	• Dependent on one approach. • High focus on targets, less on other themes. • No guarantees that FIs are progressing on their targets once validated.
External or proprietary assessment of alignment by third parties	• Independent assessments reduce bias and offer a more objective evaluation. • These assessments provide a broader, holistic view, often based on established frameworks, enhancing credibility.	• Inconsistent methodologies across third-party or proprietary assessments can make comparison difficult. • Proprietary methods may lack transparency and focus on different aspects, providing an incomplete alignment picture.

There are a few points of attention when choosing a methodology to assess whether a financial institution is "aligned":

- Some alignment frameworks and target-setting protocols provide voluntary guidance without formal checks, while others include validation processes or rely on third-party assessments. The level of oversight significantly affects the reliability and comparability of financial institutions' alignment with climate goals.

- Existing frameworks and methodologies also vary in terms of the themes they assess, which can include governance, strategy, and target-setting. The broader the scope of themes covered, the more comprehensive the evaluation of an institution's overall climate alignment, yet the more diluted any single theme in the final score, unless an appropriate aggregation system is put in place (e.g. maturity scale).

- Each theme may have different levels of stringency regarding its specific requirements, such as the need for board-level oversight or binding emissions reductions. The rigour of these requirements plays a key role in determining how strongly an institution is aligned with global climate objectives.

- The requirements for setting emissions reduction targets differ across methodologies, with variations in scope, timelines, and levels of ambition. More prescriptive methodologies tend to offer clearer alignment with the global carbon budget and global climate goals.

- Some methodologies assess the composition of a financial institution's portfolio to ensure its investments are consistent with its climate commitments. The authors of this report consider this best practice.

- Methodologies differ in their coverage of financial services and asset classes, with some focusing narrowly on certain activities while others offer broader assessments. A methodology that covers a wider range of asset classes provides a more complete view of alignment across the institution's portfolio.

- The role of carbon credits and offsets in achieving climate targets varies between methodologies, with some allowing them, others restricting them, and some disallowing them altogether. A heavy reliance on offsets may indicate that the institution is not prioritising direct emissions reductions, which weakens its overall alignment.

- As climate science evolves and the urgency for emissions reductions increases, the definition of what constitutes an "aligned" financial institution may need to be adapted. Methodologies should remain flexible, incorporating stricter benchmarks over time to ensure institutions continue to improve their climate strategies.

The Alignment Cookbook 2 [ILB, 2024] includes an overview of the Net Zero initiatives, Science Based Targets initiative (SBTi) Target Setting Protocol (TSP) and methodologies at FI-institution level.

A zoom on FI Transition alignment assessment methodologies built by external stakeholders

FI Transition alignment assessments methodologies (at the individual financial institution level) vary across several areas: the type and range of themes considered to evaluate financial institution assessment (governance, targets, strategy, actions, transparency), the indicators chosen to assess the themes and the methodologies used to derive these indicators.

On this last point, it is useful to differentiate between methodologies that use only qualitative data and those that also integrate a quantitative assessment element [ILB, 2024].

Most of the existing methodologies evaluate financial institutions' alignment 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" (illustrative only). These include:

- 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 Sustainable Finance Observatory FI-level net-zero analysis [SFO, 2023] at FI-level;
- The Transition Pathway Initiative 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 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's methodology on financial institutions' transition plans [2024].

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[4], the CDP Net Zero Assessment dataset[5] and Influence Map Climate Change methodology[6]. 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

[4] When taking together the TPI Carbon Performance and Management Quality modules.

[5] Covers both financial institution and non-financial institution entities.

[6] Itself based on PACTA for its portfolio Paris Alignment Scores.

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.

Additional considerations to consider when using these methodologies include:

- Notably, several financial institution transition alignment assessment methodologies do not give a single alignment score - but rather a score per theme (e.g. governance, targets...). For these methods to be used as inputs in *FI transition alignment approaches* for a group of financial institutions, one may need to perform an additional layer of analysis to aggregate the thematic results into a single output for each financial institution.

- Very few financial institutions transition alignment methodologies include a review of past, current and/or projected financial flows and stocks alignment. ACT Finance and Influence Map Climate Change methodology are the only two that look at this aspect amongst the methodologies reviewed.

In parallel, most private vendors have developed methodologies to attribute an alignment score to portfolios, based on the alignment of underlying financial assets. Financial institutions, as counterparties, are therefore attributed an alignment score. When reviewing available methodologies, the Alignment Cookbook 2 concluded that approaches vary widely [ILB, 2024]. Most of these methodologies consider only emissions, in more particularly scope 1 and 2 emissions. Where they integrate scope 3 emissions, it is only using the target disclosed by the FI, compared to a global reduction rate as expected in transition scenarios. It remains to be seen how these methodologies evolve, with a few vendors' now incorporating more qualitative elements, seeking to assess the financial institution's exposure to different sectors and geographies, and derive more specific estimates of their emissions associated with financial services.

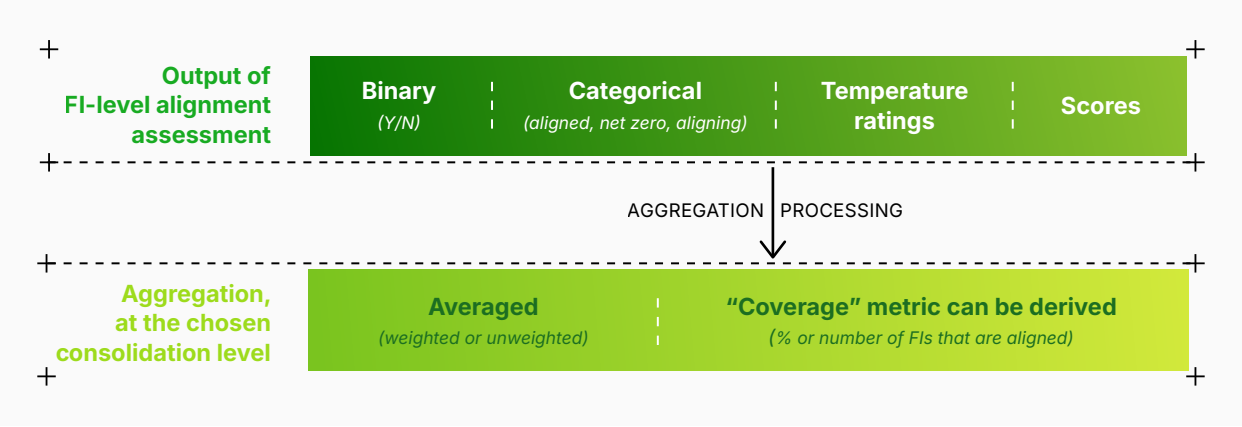
STEP 2

AGGREGATE THE FINANCIAL INSTITUTIONS' ALIGNMENT RESULTS AND DERIVE A CONSOLIDATED ALIGNMENT METRIC **FOR A GROUP OF FINANCIAL INSTITUTIONS**

The output of FI-level alignment assessments can take the form of different metrics, such as binary metrics (Y/N), categorical metrics (aligned, net zero, aligning...), temperature ratings and/or scores for example.

The second step is to aggregate these results at the chosen consolidation level. These results can either be averaged (weighted or unweighted) at the consolidated level, or a "coverage" metric can be derived – for example: "% or number of FIs that are aligned."

Figure 5 - Aggregation process, from aggregated results to a consolidated alignment metric



We identify different aggregation variables that can be used to build the consolidated alignment metric, whether an average or a "coverage" metric:

- Number of financial institutions,
- Financial metric (e.g. investments, lending, underwriting value, see table 5 for examples),
- Emissions.

Table 5 - Potential financial metrics aggregation variables applicable to specific financial services

ACTIVITY	POTENTIAL FINANCIAL METRIC
Lending	Loan commitment, Loan amount, Exposure at default, Revenue, Total assets
Asset owner investment	Assets under ownership, Assets under control, Revenue, Total assets
Asset manager investment	Assets under management, Revenue, Total assets
Capital market underwriting	Amount issued, Revenue, Total assets
Insurance underwriting	Gross written premium, Revenue, Total assets

Each of the three types of aggregation variables has its own strengths and limitations, with trade-offs between ease of use, financial relevance, and direct environmental impact.

- The count metric is easy to implement and ensures all institutions are considered, but it treats all institutions equally, regardless of their size or climate impact.
- The financial value metric reflects the scale of financial services, providing a natural weighting system, but it struggles with consistency across different financial metrics and may not accurately represent climate impact.
- The emissions metric directly links financial institutions' actions to their climate outcomes, offering a more tangible assessment of their environmental impact, but it is dependent on the accuracy and availability of emissions data, which can be inconsistent across institutions and sectors.

Table 6 - Summary of key pros and cons for each aggregation approach considered

AGGREGATION VARIABLE	PROS	CONS
Count	• Simple to implement. • Ensures that every financial institution is included, regardless of size or impact.	• Treats all financial institutions equally, regardless of size or potential climate impact.
Financial value	• Natural weighting system: provides a built-in weighing system, as a dollar value can represent the scale of climate-related financial service.	• What metric to use? (e.g., AuM, revenue, total assets) • Difficult to compare across different financial services (e.g., AuM vs. gross written premium) if the user wishes to assess the consolidated alignment of a group of FIs across FI types. • Does not indicate whether the financial institution has a significant climate impact. • Relies on fluctuating monetary values that may not reflect actual emissions or climate impact
Emissions	• Directly links financial institutions' activities to their climate impact. • Focuses on real-world outcomes through emissions reductions. • Offers a tangible, measurable metric that can align with global climate goals	• Relies on the accuracy and availability of emissions data, which may vary between institutions. • Calculation methodologies can be inconsistent across sectors and regions. • Requires reliable reporting, which may not be available or standardised.

3.3. Examples of existing methods that follows the FI Transition alignment philosophy to assess the consolidated alignment of a group of financial institutions

Many examples exist of this type of approach as it is the simplest, and most applied so far. This section highlights a few selected examples, focusing on the methodology used to define a financial institution as aligned, the aggregation variable used as well as the final output. Table 7 summarises the key findings.

Table 7 - Summary of key publications and their respective metrics for FI Transition alignment assessment

PUBLICATION	AGGREGATION VARIABLE	OUTPUT (NOT EXHAUSTIVE)
GFANZ Progress Report – Aggregated [GFANZ, 2023]	Counting FIs	• The total number of financial institution (FI) members • The number of FIs that have set interim targets • The number of FI members committed to disclosing transition plans within the next year • The distribution of members across alliances • The number of FI members that have established interim targets within each alliance
GFANZ Progress Report [GFANZ, 2024]	Counting FIs	• Proportion of globally systemic banks participating in GFANZ alliances
GFANZ Progress Report - Suballiance factsheets [GFANZ, 2023]	Counting FIs	• The number of FIs that are due to set interim target [NZAM factsheet] • The number of FIs having disclosed their transition plans through PRI and CDP reporting frameworks [NZAM factsheet] • The share of signatories with approved interim targets also have a fossil fuel policy [NZAM factsheet] • The share of members alignment with the “NZAOA thermal coal position” [NZAOA factsheet]
GFANZ Progress Report – Suballiance factsheets [GFANZ, 2023]	Financial value	• Asset manager: The sum of AuM [NZAM factsheet] • Asset manager: The sum of AuM committed to NZ [NZAM factsheet] • Asset manager: The proportion of AuM committed to NZ within the FI’s portfolios [NZAM factsheet] • Insurance underwriting: The sum of gross written premium [NZIA factsheet] • Investment consultant: The sum of assets under advisement [NZICI factsheet]

NZAOA Progress Report [NZAOA, 2023]	Counting FIs	The percentage of members with an engagement target
NZBA Progress Report [NZBA, 2023, 2024]	Counting FIs	• The share of members that have set a 1.5°C aligned target with a scenario • The share of members that have set a 1.5°C aligned target with a scenario for a specific sector (the most carbon intensive one) • The percentage of FI members establishing sector-specific targets in high-emitting sectors
NZAOA Progress Report [NZAOA, 2023]	Financial value	• The total AuM of members with intermediate targets • The total AuM covered by intermediate targets
NZAOA Progress Report [NZAOA, 2024]	Financial value	Percentage of AuM covered by sub-portfolio targets per asset class
NZAOA Progress Report [NZAOA, 2024]	Counting FIs	• Members' exposure to and positions on O&G • The total number of engagement targets fully achieved • The proportion of engagement targets fully met relative to the total number of engagement targets
NZBA Progress Report [NZBA, 2023]	Financial value	The proportion of FI members relative to their universe, meaning their share compared to total global banking assets, e.g. "members collectively representing over 40% of global banking assets"
Net Zero Donut [SFO, 2023]	Counting FIs	All themes/indicators can be used, for example: • Number of FIs that published: an alignment target; financing target; investing target; engagement target; absolute decarbonisation target; sectoral target. • The number of FIs that are in line with the realisation of their objectives • The number of FIs that have committed to exit fossil fuels
Net Zero Donut [SFO, 2023]	Financial value	The share of financial assets covered by NZ commitment
CPI – NZFT [CPI, 2024]	Counting FIs	• The number of FIs that have set net-zero targets (short- and medium-term targets) • The number of FIs that have validated net-zero targets • The number of FIs that have a fossil fuel policy • The number of FIs that have set climate finance targets
CPI – NZFT [CPI, 2024]	Financial value	The share of AuM, Total assets and Revenue related to climate-related projects
TPI – NZBAF [TPI, 2024]	Counting FIs	The % of 'Yes' scores represents the proportion of positive scores out of the total 72 sub-indicators in the NZBAF

Net zero initiative

Net Zero initiatives have developed frameworks and tools to support financial institutions net-zero commitments and turn them into action. Many of these initiatives, including GFANZ and its sub-alliances like NZAOA and NZBA, publish progress reports to track the advancements of their members.

At the end of 2023, GFANZ released its progress report, presenting key performance indicators (KPIs) for the eight financial sector-specific alliances under its umbrella [GFANZ, 2023].

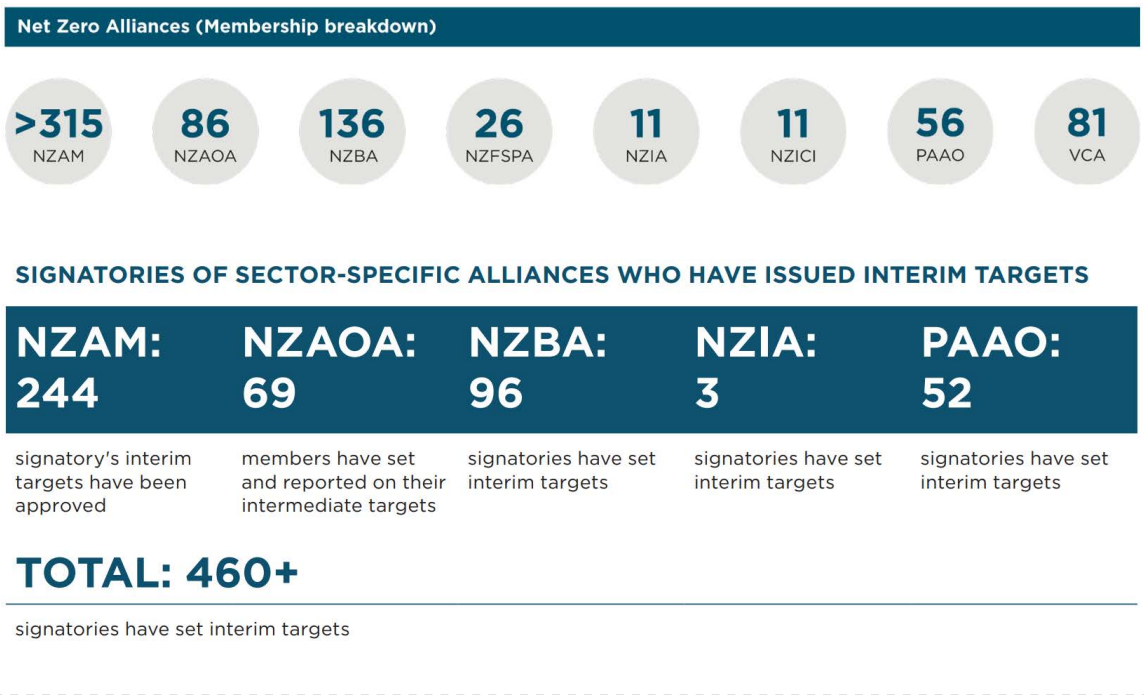
1. These KPIs were reported both in an aggregated format and at the level of each individual alliance.

2. To simplify the assessment of the aggregated progress of its various alliances and their members, GFANZ primarily focuses on counting financial institutions through different metrics (see table 7).

3. Additionally, the report includes updates on specific alliances like NZAM, providing relevant metrics through fact sheets that not only count their respective FIs but also assess the related financial value.

Individual net zero initiatives also release progress reports, such as NZAOA, NZBA and NZAM, highlighting the advancement of their respective members towards climate alignment. These reports focus on counting financial institutions and evaluating the associated financial value, but they use different sets of metrics.

Figure 6 - Overview of different "financial institution alignment" metrics used in the GFANZ 2023 progress report [GFANZ, 2023]



Global Stocktake

The Paris Agreement established the Global Stocktake (GST) to assess progress toward its goals every five years, starting in 2023 [UNFCCC, 2023]. This process evaluates whether countries and stakeholders are collectively advancing toward low GHG emissions and climate-resilient development.

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].

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".

Consequently, the GST uses figures on the scale and volume of financial initiatives related to efforts to achieve the goal set out in Article 2.1c for these financial actors, alongside private and public climate finance flows metrics for other parts of the financial system.

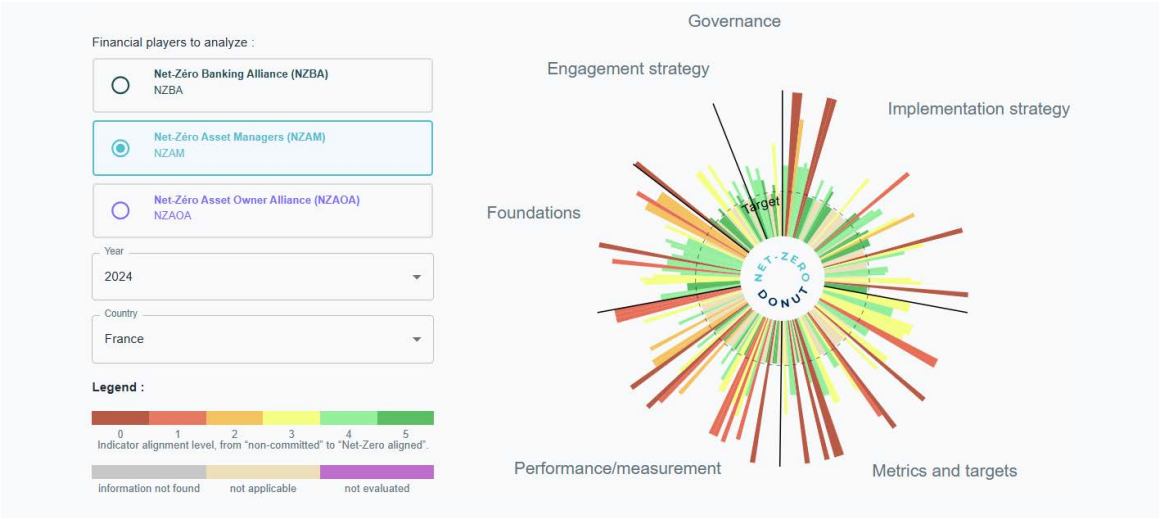
NZ donut - SFO

The Sustainable Finance Observatory assesses the transparency of financial institutions on climate metrics and ESG engagements [SFO, 2023]. This analysis is based on the Net Zero Donut tool, which evaluates the transition plans of financial actors using indicators from net zero initiatives (NZAM, NZAOA, NZBA, GFANZ), as well as reference papers (ACT, GHG Protocol, CA100+, etc.), and reporting frameworks (ISO, IFRS, ESRS).

This tool assesses institutions individually using more than 170 indicators that cover key areas such as governance, implementation strategies, engagement policies, and climate metrics, ensuring continuous improvement through annual review by an expert committee [SFO].

In 2023, the Net Zero Donut calculated average alignment scores per indicator for each group of institutions (banks, asset owners, asset managers), using equal weights between financial institutions.

Figure 7 - Net Zero Donut [SFO]



CPI - Net Zero Finance Tracker (NZFT)

More recently, CPI has launched the Net Zero Finance Tracker (NZFT) to complete its net zero financing view (see sub-section 4.3) with a comprehensive assessment of financial institutions (562 GFANZ members as of December 31, 2022) net-zero claims, looking at their commitments (Targets), and their action within the institution (Implementation), as well as their contribution to the real economy (Impact).

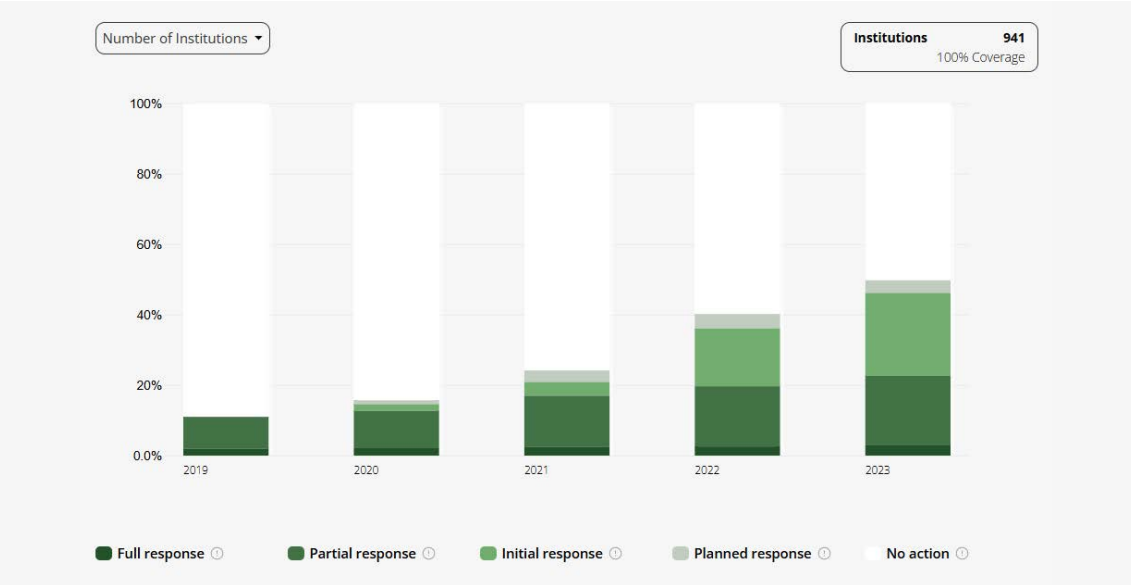
CPI's short conclusion so far is that financial institutions' commitments strive to drive net zero financing in the real economy, arguing that "it takes time to convert goals and action into results".

Within the three areas of Targets, Implementation and Impact, the NZFT:

- Evaluates specific elements such net-zero targets and fossil fuel exclusion policies, using different categories (from "no action" to "full response").
- Allows the user to see the results per country, sector, financial actor type and coalitions.
- Allows the user to consolidate the results by either counting the number of financial institutions meeting the alignment criteria (e.g., validated net-zero targets) or using value metrics including AuM, revenue or total assets).

Notably, the "impact" dimension looks at "quantitative changes in stocks and flows of relevant targets and investments" as well as financed emissions and relates more to Financing and FI Emissions alignment approaches (see sections 4 and 5).

Figure 8 - FIs' policies regarding fossil fuels, from CPI Net Zero Finance Tracker platform [CPI]



TPI - Net Zero Banking Assessment Framework (NZBAF)

In 2024, the Transition Pathway Initiative (TPI) published an assessment of 26 banks, evaluating their preparedness for the low-carbon transition using their framework, called Net Zero Banking Assessment Framework (NZBAF). This framework includes 72 sub-indicators across 10 distinct areas, enabling a comprehensive analysis. These areas range from climate target assessments and decarbonization strategies to climate policy engagement and annual reporting conformity. Each sub-indicator is evaluated individually for each bank, with a "Yes" or "No" output, simplifying consolidation at both the area level and overall framework level. Ultimately, each bank receives a consolidated score ranging from 0 to 100, reflecting its alignment with these indicators at the institutional level. The report also presents a consolidated result at the group level, revealing that, on average, the selected banks meet only 20% of the 72 sub-indicators [NZBAF, 2024].

ACT Finance

The ACT Finance methodology provides a comprehensive framework for assessing the transition alignment of financial institutions (FIs). It is structured around eight modules, each addressing a key dimension of an FI's transition strategy: Targets (Module 1), Intangible investment (Module 3), Portfolio Climate Performance (Module 4), Management (Module 5), Investors/Savers Engagement (Module 6), Investees/Clients Engagement (Module 7), Policy Engagement (Module 8), and Business Model (Module 9). This multi-faceted approach enables a detailed and structured assessment of an FI's transition progress, integrating both qualitative and quantitative indicators.

While the ACT Finance methodology was designed primarily for FI-level assessments, its weighting principles and assessment structure could be adapted for consolidated alignment evaluations of multiple institutions. The framework's modular design allows for scalability, ensuring that it can be leveraged for both individual FI assessments and group-level analyses. In particular, its categorization framework, which classifies institutions into different transition maturity levels, can be applied to consolidated assessments by aggregating individual FI scores [ACT, 2024].

3.4. Pros, cons and areas for further research

In theory, FI Transition alignment approaches are very simple to implement. A benefit of this type of approach is that they usually focus on a multidimensional assessment of "who" finances in relation to the transition.

Yet, in practice and as shown in this section, the quality of the output is highly dependent on the specific methodology used:

1. No consensus exists on how to define “climate-aligned” financial institutions; most available methodologies are based on qualitative indicators – needed but insufficient by themselves to evaluate whether the past, current, and projected financing and associated emissions are aligned with a specific decarbonization pathway.

2. Aggregating the results using count variables does not consider the relative size of financial institutions. Aggregating them using financial metrics makes the results sensitive to market fluctuations and still bears no direct link to real-world impact. Taking emissions into account adds a layer of data needs and complexity.

It is unclear whether any FI Transition alignment methodology ensures that at the macro-level, given the underlying FI-level alignment assessment methodology and aggregation variable chosen, the consolidated emissions of “aligned” financial institutions do not overshoot the remaining carbon budget and their collective financing actions are sufficient to finance the transition.

Therefore, an area for further research is how to design an approach that takes the above into account.

4.
DEVELOPING FINANCING ALIGNMENT APPROACHES TO ASSESS THE CONSOLIDATED ALIGNMENT OF A GROUP OF FINANCIAL INSTITUTIONS

4.1. What are Financing alignment approaches and why are they important?

Financing alignment approaches aim to measure past, current, and/or future alignment of financial flows and stocks, and compare them to the level, pace and rate of change expected in relation to the global financing and investment climate goals.

These approaches seek to answer the question: "are financial flows (and associated stocks) being re-directed adequately in terms of rate and pace towards relevant counterparties in relation to the global climate goals away from climate-incompatible counterparties"?

The monitoring of financial flows and stocks into "climate-aligned" investments, and more broadly alignment categories, is not a new topic.

Macro-level research in this area has notably been encouraged by Article 2.1.c of the Paris Agreement which calls for "making finance flows consistent with a pathway towards low greenhouse gas (GHG) emissions and climate-resilient development." While there is no clear definition of what exactly it entails, the idea has made its way into private financial institutions' alignment frameworks.

This is partly because 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.

Recommended by some frameworks (SBTi FINZ climate alignment targets [2024], IIGCC asset class targets [2024] and ACT Finance assessment of Financing and engagement targets, and financial flow trends [2024], UNEP "Developing Metrics for Transition Finance", [2023]), **financing metrics are increasingly seen as useful to pilot the transition, together with emissions' metrics. The latter are increasingly seen as an accountability, monitoring tool – ensuring that the reorientation of financial flows leads to the right level of decarbonization**.

4.2. How are Financing alignment approaches built?

In the authors' view, one can distinguish the following steps to implement Financing alignment approaches to assess the consolidated alignment of a group of financial institutions:

1. Define how to categorise financial flows and stocks into alignment categories, and in particular what climate-aligned financial flows and stocks, and counterparties means;
2. Quantify current (and potentially project) the alignment of financial flows and stocks;
3. Derive benchmark(s) for the alignment financial flows and stocks through time and assess alignment;
4. Aggregate the results at the desired level of consolidation (e.g. pre-defined group of financial institution).

Notably, this type of analysis involves looking a both sides of the equation: "aligned" flows and stocks on the one hand and "incompatible" flows and stocks on the other. Both are equally important. In this deep dive, the authors focus on the "aligned" part more specifically, as it has been less researched (and implemented in existing approaches).

Figure 9 - Summary of keys steps to implement Financing alignment approaches

FINANCING ALIGNMENT APPROACHES

STEP 1 DEFINE HOW TO CATEGORISE FINANCIAL FLOWS & STOCKS INTO ALIGNMENT CATEGORIES, INCLUDING "CLIMATE ALIGNED"

Identify alignment categories based on existing frameworks such as:

- **European Commission**: Sustainable, Green, Transition finance
- **SPF**: Uses European Commission's definition , emphasizing primary market activities and secondary market instruments
- **GFANZ**: Defines transition finance with four strategies (Climate solution, Aligned, Aligning, Managed phase-out)
- **SBTi Net Zero Standard**: Climate-aligned, transitioning, net-zero achieved

Consider both flows and stocks of capital

Distinguish between new, or additional money ("flow") and static or accumulated money ("stock")

- **Flows**: new financing activities within a defined period, reflecting how funds are being redirected towards climate-aligned projects (e.g., annual issuance of green bonds by financial institutions)
- **Stocks**: total amount of capital accumulated over time, showing long-term commitments (e.g., total volume of green loans held by a bank at a given point)

STEP 2 QUANTIFY CURRENT (AND POTENTIALLY PROJECT) THE ALIGNMENT OF FINANCIAL FLOWS AND STOCKS

Identify main existing approaches:

- **Use FI reporting**: e.g., Green Asset Ratio, Green/Brown ratios, share of AUM in climate-aligned financial assets
- **Map financing towards known climate-aligned instruments**: e.g., green bond, funds tracking EU climate benchmarks
- **Trace financing to counterparties and assess their climate alignment:**
  - Using databases: tools like Anacredit for commercial lending, green bond databases, Bloomberg, etc.
  - Classify each counterparty into an alignment category such as net-zero, transitioning, and enablers using a known or proprietary methodology

Investigate whether a mix of the main existing approaches should/could be used:

- **Often the most practical, depending on data availability**
- **Consider type of activity** (e.g., financing, lending)**, known vs. unknown use of proceeds** (e.g., green loans vs. general-purpose financing)**, market types** (primary market for new financing vs. secondary market for trading of existing financial assets)

STEP 3 ASSESS THE ALIGNMENT OF FINANCIAL FLOWS & STOCKS THROUGH TIME

Perform dynamic comparisons to alignment benchmarks:

- **Evaluate whether the current state of "climate-aligned" finance matches what is required under desirable, climate-compatible scenarios, using specific benchmarks** to assess whether these flows or stocks are being reallocated at the right pace and scale to meet net-zero transition needs.

Depending on the type of metric used to qualify financial flows and stocks as climate-aligned, choose an approach to derive alignment benchmarks:

- **Scenario-based**: for metrics relating to instruments with known use of proceeds (in monetary value or ratio, e.g., green/brown ratio)
- **Normative**: only approach possible for relative metrics, expressed in scores (e.g., portfolio ITR rating), alignment (e.g., taxonomy-alignment), categories (e.g., % flows to net-zero aligned, to transitioning financial assets, etc.)

STEP 4 AGGREGATE THE RESULTS

Where financing alignment was assessed at the financial flow or financial stock level, choose a weighting criteria for consolidation, such as:

- **Financing value**: Use the size of the financing (e.g., market cap, value of equity AuMs)
- **Emissions**: Consider emissions-based metrics (e.g., financed emissions, emission intensity, emissions of equity AuMs)
- **Exposure to climate-relevant sectors**: prioritize sectors with high GHG emissions or decarbonisation potential (SBTi FINZ, NZAOA, IIGCC)
- **Characteristics of the methodology**: adjust weights based on the reliability or maturity of the methodology used for specific asset classes
- **Type of asset class and its link to the real economy**

Where absolute metrics are used to map climate-aligned financing and financing alignment is to be assessed at the consolidated level:

- **Sum absolute values**: calculate the total value of climate-aligned financing across different asset classes
- **Assess net zero financing alignment with net-zero pathways**: sector-specific where possible
- **Segmented assessment**:
  - Primary new investments: focus on direct investments with known use of proceeds (e.g., project finance, infrastructure)
  - Investment in entities: include financing directed to entities (e.g., corporates, governments) that directly support the real economy

CONSOLIDATED FINANCING EMISSIONS ALIGNMENT

STEP 1

DEFINE HOW TO CATEGORISE FINANCIAL FLOWS AND STOCKS INTO ALIGNMENT CATEGORIES, AND IN PARTICULAR WHAT CLIMATE-ALIGNED FINANCIAL FLOWS AND COUNTERPARTIES MEANS

While there is a growing consensus on what climate-incompatible financing encompass – fossil fuel financing, there is no single definition of on "climate-aligned" financing, or what characteristics these flows and stocks of capital should exhibit. Its meaning is intertwined with "green", "sustainable" and "transition" finance.

No formal taxonomy of climate-aligned finance exists but all frameworks recognize it encompasses financing to 1. enablers, 2. net-zero achieved and 3. **Transitioning counterparties.** Existing definitions provide non-exhaustive examples of financial flows and stocks that could qualify as "climate-aligned".

Table 8 - Definitions of "climate-aligned" financial flows from four selected frameworks (non-exhaustive)

NAME	DEFINITION	EXAMPLES OF FINANCIAL FLOWS AND STOCKS QUALIFYING AS "CLIMATE-ALIGNED"
European Commission [2023]	Key concepts: "Sustainable", "green" and "transition finance". • "Sustainable finance is about financing both what is already environment-friendly [green finance] and what is transitioning to such performance levels over time [transition finance]". • "Although the Union's legal framework does not define the concept of transition finance, transition finance should be understood as the financing of climate- and environmental performance improvements to transition towards a sustainable economy, at a pace that is compatible with the climate and environmental objectives of the EU."	"Transition finance means financing of investments compatible with and contributing to the transition, that avoids lock-ins, including: (a) investments in portfolios tracking EU climate transition benchmarks and EU Paris-aligned benchmarks ('EU climate benchmarks'); (b) investments in Taxonomy-aligned economic activities, including: • Transitional economic activities as defined by Article 10(2) of Regulation (EU) 2020/852 for the climate mitigation objective, • Taxonomy-eligible economic activities becoming Taxonomy-aligned in accordance with Article 1(2) of Commission Delegated Regulation (EU) 2021/2178 over a period of maximum 5 (exceptionally 10) years (28); (c) investments in undertakings or economic activities with a credible transition plan at the level of the undertaking or at activity level; (d) investments in undertakings or economic activities with credible science-based targets, where proportionate, that are supported by information ensuring integrity, transparency and accountability. Undertakings are encouraged to use one, or a combination of several, transition-related financing instruments to raise transition finance, such as specific loan types or capital market issuances with specific features [green or other sustainability loans, bonds, equity financing and specialised lending]."

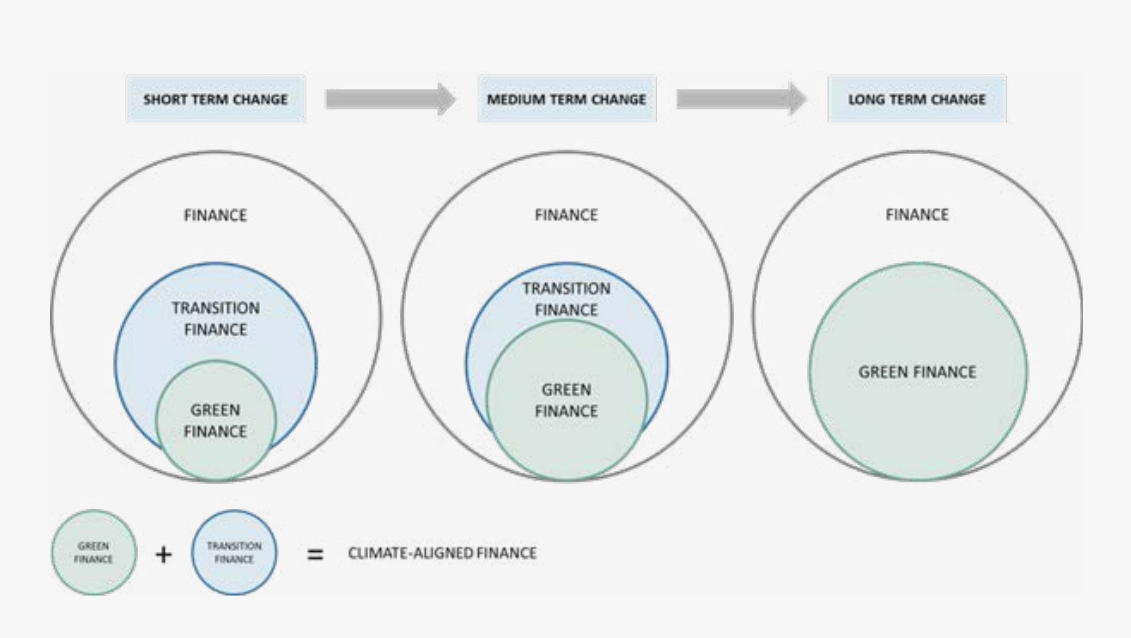
PSF [2024]	Leverage the definition of the European Commission and seeks to build a robust monitoring framework and set of indicators that will allow an assessment of the alignment of capital flows in the EU's financial sector with the Union's net zero targets.	Financial sector entities and instruments are analysed through the following lens:
		• Primary market
		  - General purpose financing (bonds and equity) will be characterised based on green CAPEX of the real economy entity.
		  - Use of proceeds financing (bonds) will be measured based on the labelling of the financing.
		  - Loans will be measured based on banks' own green criteria as well as the Green Asset Ratio.
		• Secondary market: Secondary market instrument analysis will rely on disclosures and labels to assess market appetite for financial assets (funds) with sustainability features.
		• Transition: Financing instruments of corporates in transition; Transition of financial institutions

GFANZ Final Report on Financial Institutions Transition plans [GFANZ, 2022]	Key concepts: "*transition finance*" (linked to net zero finance). • "**Transition finance** [regroup] investment, financing, insurance, and related products and services that are necessary to support an orderly, real economy transition to net zero as described by the four key financing strategies [listed]."	GFANZ has identified four key financing strategies that define transition finance. These strategies (shown on the next page) are inclusive of financing, investment, insurance, and related products and services that are critical to delivering real-economy emissions reduction in support of an orderly, net- zero transition of the global economy. • **Climate solutions**: Financing or enabling entities and activities that develop and scale climate solutions. • **Aligned**: Financing or enabling entities that are already aligned to a 1.5°C pathway [e.g. company with a validated 1.5°C SBTi target and/or credible transition plan and shows adequate progress through time]. • **Aligning**: Financing or enabling entities committed to transitioning in line with 1.5°C-aligned pathways. • **Managed phase-out**: Financing or enabling the accelerated managed phaseout (e.g., via early retirement) of high-emitting physical assets
SBTi Financial Institutions Net Zero Standard Consultation Draft V0.1 [SBTi, 2024]	Key concepts: "climate-aligned", "transitioning", "net-zero achieved". • "**Climate-aligned** entities and activities [...] include those already achieving emissions progress compatible with limiting warming to 1.5°C (**net-zero achieved activities**) and those actively working towards this goal (**transitioning activities**)." • "**Transitioning** represents the counterparties transitioning in a manner consistent with achieving global climate goals. It comprises both ambition (measure of transition in the short-term and based on public targets and plans); and progress (the delivery of emission reductions and the transformation of assets that is consistent with achieving 1.5°C aligned ambition)." • "**Net-zero achieved** represents the state of an activity or entity that does not result in the accumulation of greenhouse gases in the atmosphere, achieving a level of emissions progress consistent with a net-zero economy."	Table 15 lists the characteristics financial intermediaries, entities, SMEs, and activities could be required to exhibit to be characterised as "net zero" or "transitioning". These characteristics encompass target-setting, transition planning, ex-post achievement monitoring and taxonomy-alignment. No specific method is mentioned in the document (at the time of writing). These characteristics change through time to highlight that what can be considered as "transitioning" today may not be sufficient in the future to ensure that the remaining global carbon budget is respected.

The definition of "climate-aligned" financial flows and stocks should change over time. While the focus may be on transitioning and enabling counterparties on the short to medium-term, it should shift to counterparties that have achieved net zero over the long run. If not, it is unlikely that it adequately supports emissions reduction in line with the remaining carbon budget (see figure 10 below).

In addition, the alignment category in which falls the counterparties of older vs new investments may need to be assessed using different methodologies – for example, as discussed by SBTi, the financing of new financial assets should not support new long-lived high emitting financial assets, while the financing of existing financial assets should be link to its improvement [SBTi, 2024].

Figure 10 - Relationship between green and transition finance today and over time – modified from European Commission, 2023



Finally, and perhaps more importantly, the focus of the above definitions is on the final counterparty's alignment status rather than on the potential of the financing to catalyse and accompany the transition of a financial asset. While the former can be an acceptable proxy for the latter for known use of proceeds investments, it may not be the case for general use of proceeds investments (see below).

For example, the IIGCC calls for a clear definition of the concept of transition finance [IIGCC, 2024], "to enable the distinction of:

- Transition finance, where the investment is catalysing the transition of the financial asset, for example through provision of ring-fenced finance for a transition activity or engagement on a specific transition outcome, underpinned by a robust stewardship model.
- Broader sustainable finance provided to financial assets that are transitioning or already aligned with net zero, but where this is not catalysed or directly supported by the investment.

- Investments that are neither of the above – where the investment is not made with the aim of supporting the financial asset to transition, and neither does the financial asset itself intend to transition."

A zoom on using counterparty alignment metric as a proxy for unknown use of proceeds instruments alignment

It is very difficult to establish a direct connection with a general use of proceeds instrument and a given investment in the real economy, or the alignment maturity of a specific counterparty.

According to the EU Platform on Sustainable Finance [PSF, 2024]:

- "The volume of financing directed towards the transition process depends greatly on which stage an entity is at in its transition. If all financing directed towards an entity in transition contributes to the transition would thus be too strong an assumption. For instance, in the case of a high-emitting company in the early stages of its transition, most of the financing received may serve to prolong its polluting activities.

- Another challenge arises concerning the certainty that the entity will effectively transition to net zero by 2050, and consequently, whether the financial flows will genuinely contribute to this transition. Following the coming Platform's proposal to address transition finance, one can analyse the specific financing channels of entities in transition that support their investments."

With greater focus being made on corporate "transition plans", it is important to highlight that best-in-class plans are not only the ones disclosing detailed and credible technological roadmap but also the ones that have credible financing plan. Ambitious transition plans should be assessed upon specific disclosure on how and when it will be financed, i.e. through project finance and other instruments such as green bonds. Transition plans financing data disclosure would also be beneficial to make the link between financing and investments. Yet, few transition plan assessment frameworks integrate this criterion in their guidance and/or evaluation methodology.

Research to link financing and investments in the real economy include Jachnik et al. [2019], Dobrinevski and Jachnik [2020; 2020; 2021], as part of the OECD country-sector pilot studies conducted between 2019 and 2021 under the Research Collaborative on Tracking Finance for Climate Action. Other studies include Hainaut and Cochran [2018] and Micale et al. [2020].

If no methodology is built to take this link into account, financial flows and stocks in general purpose instruments characterized using the alignment maturity of the underlying counterparty capture only exposure, rather than contribution.

A zoom on stocks and flows

To properly monitor and evaluate the evolution of financing, it is necessary to distinguish between new, or additional money ("flow") and the static or accumulated money ("stock"). Going further, a distinction can be made between net and gross capital flows.

Both metrics serve different purposes and should be disclosed separately for clarity purposes, as well as avoiding double-counting issues. As put by the PSF [PSF, 2024]:

- "Stock [metrics are] useful to understand the point in time progress of the accumulated financial assets in the economy towards, for instance, an environmental investment gap."
- "Capital flows describe the capital flowing to an entity or to an investment during a defined period. Flows provide a better picture of new investments and consequently the sense of direction for the capital stock as a whole."
    - "Gross capital flows refer to total in- or outflows for a certain indicator, while net flows are the residual when both in- and outflows are netted. Examples of gross and net capital flows are respectively the amount of green bonds issued for one year and the net in/outflows to/from an investment fund for one year."
    - "For primary market instruments, a gross flow perspective is preferred as it provides the best indication of new capital to the real economy (with the caveat that refinancing complicates this analysis). For the secondary market, the framework mainly relies on net flows and stock indicators to avoid double-counting."
    - Notably, most metrics reported by FIs are stock metrics, such as the Green Asset Ratio (GAR) and Green Investment Ratios (GIR). Using external datasets to map financial flows (bottom-up approach), it is sometimes possible to segment the analysis between stocks and flows. When doing so, it is essential to make sure that the alignment benchmark used (cf Step 3) is expressed in the same way.

STEP 2

QUANTIFY CURRENT (AND POTENTIALLY PROJECT) THE ALIGNMENT OF FINANCIAL FLOWS AND STOCKS

A review of table 9 / figure 11 and additional literature [Platform on Sustainable Finance, 2023] show that there are three broad ways to identify current climate-aligned financial flows and stocks:

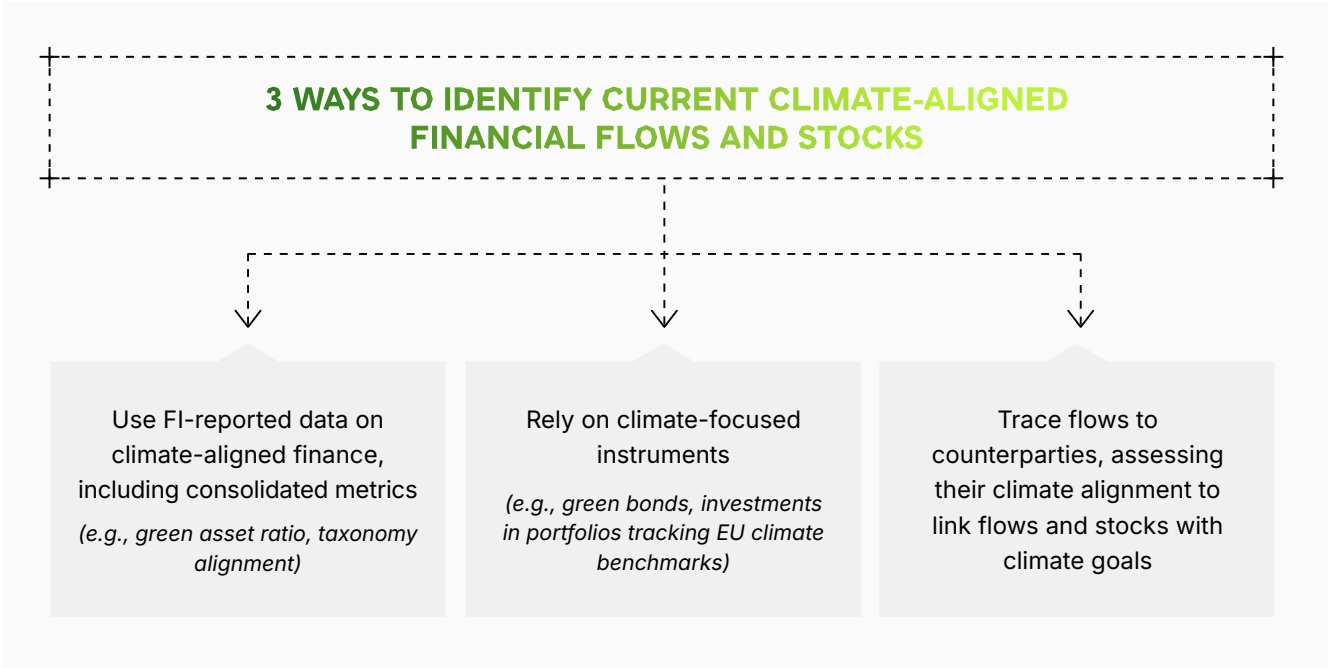
1. **Rely on the mandatory and voluntary reporting of financial institutions on specific indicators**, generally already consolidated at the portfolio, fund, or asset-class levels (green asset ratio and taxonomy alignment, alignment indicators...). This landscape evolves rapidly – for example, bank-specific ESRS are expected in 2026/2027 under the CSRD or CRD6 requirements.

2. **Map financial flows and stocks towards pre-determined financial instruments with climate-alignment objectives** (e.g. green bonds, investments in portfolios tracking EU Climate benchmarks...) as a proxy when no data is reported (see point 1) and bottom-up approaches (see point 3) are not possible/too complicated to implement.

3. **Trace back all financial flows to the final counterparty (activity or entity), assess whether the counterparty qualifies as "climate-aligned" using a chosen methodology** and use the alignment status of the final counterparty to characterise the link of the financial flow/stock to the global climate goals.

These approaches can also be applied to quantify financing towards climate- incompatible counterparties – notably stocks and flows towards counterparties exposed to fossil fuels.

Figure 11 - Approaches to classify financial flows and stocks into alignment categories



Notably, several external providers' methodologies build on option 3 to produce their own indicators. This is the case for Reclaim Finance [2024], WRI [2024] and BNEF [2024]'s work on green brown ratios, as well as Influence Map methodology [2023]. No other methodologies are based on a detailed look-through composition of FIs portfolios. ACT Finance includes a maturity scale matrix to help assess whether indicators produced by FIs using their own internal approach can be considered mature/strong-enough within the current state of research.

In practice, it is likely that a mix of the above approaches is the most practical way going forward, depending on the availability and comparability of data. The choice of approach may differ across:

- The type of financial service (financing, lending, insuring, capital markets);
- Known and unknown use of proceeds instruments;
- Primary and secondary market transactions;
- Direct and indirect (in funds).

All of these should be done considering the difference between stocks (cumulated flows) and annual flows of financing.

Table 9 highlights examples of data sources as well as pros and cons for each of the options described.

Table 9 - Pros and cons for each option to identify climate-aligned financing

OPTIONS	EXAMPLES	PROS AND CONS
1. Rely on the mandatory and voluntary reporting of financial institutions on climate-aligned finance, generally already consolidated at the portfolio, fund, or asset-class levels	• Green asset ratio • Banking Book Taxonomy Alignment Ratio • Gross carrying amount (MEUR) of credit exposure per sector, of which taxonomy aligned (environmentally sustainable CCM) • Total gross carrying amount of loans collateralized by immovable property, split by commercial/residential, EU/non-EU, energy efficiency (Kwh per m2) and EPC label • Green investment ratio • Other green loans and financial asset data • Green brown ratio reporting • Alignment reporting (EBA) • Portfolio share towards financial assets with validated SBTi targets • Portfolio temperature (as per SBTi) • Portfolio share towards climate-aligned counterparties • Other portfolio alignment reporting data	• Relies on reported data; • Depending on the indicator reported and whether specific guidelines are given for its calculation in regulatory texts or market standards the data may not be comparable; • Partial coverage in terms of asset classes and financial services; • Few normalized indicators focus on transitioning financial assets.

2. Map financial flows and stocks towards pre-determined financial instruments with climate-alignment objectives	• Green bonds & loans dataset (Climate Bonds Initiative) • Flows to other unlabelled green bonds • Flows to SLBs • Flows to transition funds (self-labelled) • SFDR article 8 & 9 • PAB CTB tracking	• Relatively easy to implement; • Depending on the instrument, its link to the transition may be tenuous (e.g. labelled green bonds vs SFDR art 8…). • Depending on the instrument, the embedded definition of what is a climate-aligned investment shows some weaknesses – for example, Art 9 relates to "sustainable investment at large" rather than climate specifically, and Art 8 is even broad. Climate indices (PAB/ CTB) rely heavily on the emissions' metric.
3. Trace back all financial flows and stocks to the final counterparty (activity or entity), assess whether the counterparty qualifies as "climate-aligned" using a chosen methodology and use the alignment status of the final counterparty to characterise the link of the financial flows and stocks to the global climate goals.	• Multiple datasets to map financial flows (Ana Credit, BNEF, Green bonds datasets…) • Multiple methodologies to assess the alignment maturity of a financial asset (cf Alignment Cookbook 2)	• If well implemented, approach that yields the most comparable and strong results; • Time-intensive and uncertain that the data is available publicly.

A zoom on bottom-up approaches

Bottom-up approaches involve tracing back all financial flows and stocks to the final counterparty (activity or entity), assessing alignment status of the counterparty and using the results to characterise the link of the financial flows and stocks to the global climate goals.

It requires 1. Mapping financial flows and stocks and 2. Deciding on a methodology to assess whether the counterparty qualifies as "climate-aligned".

Databases available to map financial flows and stocks include but are not limited to Anacredit for commercial Lending, green bond databases, the World Bank Private Participation in Infrastructure database, Bloomberg, Thomson Reuteurs and other financial services provider's datasets on portfolio composition, BNEF datasets on renewable energy investments etc. These datasets have different access conditions as well as coverage – and it is likely to be time-intensive to use and combine them.

Once financial flows and stocks have been traced back to the final counterparty, the second step is to classify each counterparty into an alignment category and see whether it falls within the scope of "climate-aligned" (net-zero, transitioning and enablers).

Options include:

- **Know use of proceeds instruments (project finance, mortgage loans, auto loans, green bonds with known use of proceeds):**

  - Use of proceeds can be mapped to specific activities and assessed using sustainable finance taxonomies, such as the EU Taxonomy on Sustainable Activities. A difference can be made between low-carbon (i.e. that already achieved net zero), transition enablers and transitioning financial assets.

  - Further research is needed to determine whether, and to which extent, the databases listed above contain all the necessary information to 1. Attribute the financing to specific financial actors and 2. Classify the activity within a taxonomical category.

- **Unknown use of proceeds (all other):**

  - There is an increasing number of frameworks that seek to classify entities into different alignment categories, using different classification criteria and methodologies to assess these criteria [ILB, 2024].

  - Financial institutions have been using proprietary climate scores based on the above frameworks or their own view of what alignment means, as well as alignment scores derived by third parties (e.g. ACT, ITR methodologies etc.)

  - An additional layer of analysis could consist in deriving the taxonomy-aligned OPEX and CAPEX reported by the final counterparty and assessing whether its evolution is aligned with net zero investment roadmaps. The Platform on Sustainable Finance proposes to monitor the taxonomy-aligned CAPEX of entities (all entities and entities classified as transitioning) financed through listed instruments [PSF, 2024].

  - The above can be mixed – i.e. taxonomy-aligned investments of financial assets evaluated as "in transition" can be carved out, as suggested by PSF, 2024, to emphasise that finance is needed to support transitioning financial assets.

Remarks on using the EU Taxonomy to assess whether a counterparty is transitioning

The EU Taxonomy differentiates between low-carbon (= net-zero achieved), enabling and transitioning activities. Notably, enabling and transitioning activities can be, and have been, seen as "in transition".

While this is a potential way to classify activities, and entities deriving revenues from these activities, it can be seen as one criteria of a wider assessment methodology, rather than an end, especially when assessing entities (e.g. corporations). This is because OPEX/revenue-based

taxonomic share is a static indicator. It does not give any indication of the trajectory on which the counterparty is, and whether the trend is adequate in relation to the transition[7].

While CAPEX taxonomic share can be seen as a better indicator, because of its intrinsic forward-looking nature, it also suffers from limitations in the context of a wider "transition" assessment. Beyond data availability and quality:

1. Revenue-based metrics may be better suited in sectors where the transition is likely to be demand-led (e.g. transport sector & consumer investments) vs capital intensive sectors (electricity generation) [IIGCC & Vivid Economics, 2022].

2. While CAPEX is a forward-looking indicator, CAPEX plans and trajectories may be better suited as a dynamic metric to indicate whether the counterparty is transitioning or not.

3. Focussing on the "green" side of the story says nothing about the "brown" side of the story. For example, as put by ACT Finance [2024a, 2024b], "should an Electric Utilities company has a 60% solar/40% coal energy mix it might be up to 60% taxonomically aligned, which is relatively high, but remain not transitioning should there be no phase out on the coal activity".

4. There is a consensus that a robust transition plan should integrate additional elements, such as targets, governance, internal processes and means put in place, financial planning etc.

Consequently, most transition alignment assessment methodologies include taxonomy-aligned as one indicator, and complement it with others (e.g. CA100+, IIGCC maturity scale, ACT).

Remarks on projecting future climate-aligned financing in bottom-up approaches.

It is not possible to project the extent to which financing is expected to shift in the future towards all types of climate-aligned counterparties.

An increasing number of mandatory and voluntary frameworks recommend/require that FIs set "alignment", "financing the transition" and/or other "financing" targets. Contrarily to exclusion targets on fossil fuels, these cannot be used to project financial flows and apply the type of bottom-up analysis described in this section as unsurprisingly the detail of what counterparty will be financed is not available (and will never be). **No methodology exist to project in which alignment categories specific counterparties are likely to be in the short, medium and long run, given the efforts taken today**. One option would be to use disclosures on CAPEX plans and targets, when data becomes more available thanks to regulatory frameworks.

[7] 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].

In a nutshell, redoing the work bottom-up is desirable for comparability and quality purposes (vs the other approaches). Yet, it involves a huge amount of work and data which may not be readily available, and assumptions. In addition, it is necessarily limited to analysing current financing alignment rather than projecting how this will evolve in the future.

A zoom on relative vs absolute metrics

The metrics used to classify financial flows and stocks as "climate-aligned" described in table 9 can be classified into absolute and relative metrics.

- Relative **metrics** refer to metrics that capture the way a given financed amount is allocated to different counterparties and instruments. Examples include green financial asset and green brown ratios, as well as % of investments allocated to climate-aligned counterparties.
- Absolute **metrics** refer to metrics that capture the absolute financial amount invested. These include all the metrics expressed in financed amounts, such has gross carrying amounts lended to sustainable financial assets.

Notably, a given metric can be expressed in both ways. This is the case of the green financial asset ratio for example – Pillar 3 Banks are expected to report both the ratio as well as the detailed calculations, including gross carrying amounts, within the disclosure template.

Both types of metrics are needed to assess financial flows and stocks alignment. Indeed, using relative metrics towards climate-aligned counterparties through time (e.g. %) is not sufficient to ensure financial institutions adequately support and contribute to the investments needs required for the transition. Even if a financial institution allocates 100% of its financing amount to climate-aligned counterparties, there is no guarantee that this would be sufficient in absolute monetary value. There is a need to consider whether investors contribute to filling the financing gap.

For example, in 2023, NZBA members collectively committed to provide over US$16TN of sustainable and transition finance, with target years ranging from 2024 to 2030 [NZBA, 2024]. This aggregated amount represents less than a quarter of the private green financing budget needs estimated by the NGFS [McKinsey & Co, 2022], the question is whether it can be qualified as net-zero aligned? A simple educated answer would argue that despite underlying invested financial assets are net-zero aligned, it is uncertain that the committed amounts are sufficient in scale.

This is particularly true in markets where a higher share of activity and investment is outside of public corporates. As put by the IIGCC & Vivid Economics [2022], "over 70% of investment needs are expected in non-OECD regions over the next three decades, with over 40% required in Asia Pacific. In many of these regions, a large share of corporate activity is in private companies and state-owned enterprises [...]. For some sectors such as building retrofits, most of the market is captured by small companies that are not listed on public equity markets and access funds through other channels. [Capital allocation metrics] fails to capture the large extent to which investors must support investment in climate solutions outside of traditional asset classes."

STEP 3

DERIVING BENCHMARKS AND ASSESSING FINANCING ALIGNMENT THROUGH TIME

Alignment assessments imply a dynamic comparison between the current state of "climate-aligned" finance and what it is expected to be/how it is expected to evolve in a desirable scenario compatible with the global climate goals. Therefore, it is necessary to:

1. Identify current (and potentially projected) the alignment status of financial flows and stocks, as described in step 2;

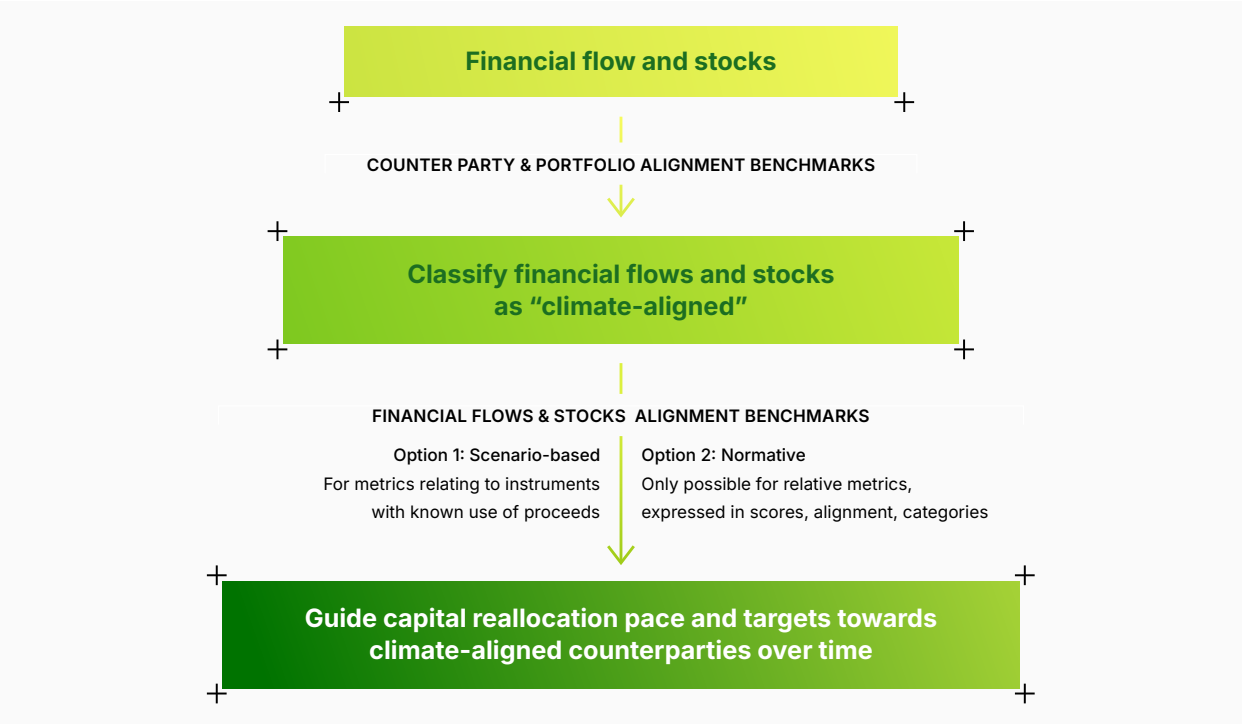
2. Compare these with (a) selected alignment benchmark(s) to assess whether capital is being re-allocated and deployed at the right pace and scale vs net zero transition needs.

Alignment benchmarks are used in two ways in financing alignment approaches.

1. Counterparty and portfolio alignment benchmarks are used to categorise counterparties as "climate-aligned", especially for financial flows considered "net zero achieved" or "transitioning". For example, in most approaches, to be classified as "net zero achieved", counterparties need to exhibit emissions (or activity-level) near their net zero level under (a) chosen transition pathway(s). Most research focuses on this type of benchmark and their construction [PAT, 2021; ILB, 2020].

2. Financial flows and stocks alignment benchmarks are used to set the desirable pace and rate of capital reallocation and deployment towards climate-aligned financial flows and stocks through time. For example, these benchmarks are used to set climate-alignment targets in SBTi FINZ – requiring that, depending on the type of financial asset, 100% of financial flows should be allocated to climate-aligned counterparties by a given year (2030, 2040...).

Figure 12 - Process for steering financial flows and stocks toward climate-aligned targets



The latter type of benchmark is of interest in this report.

Research shows that there are two broad ways to derive financial flows and stocks alignment benchmarks: scenario-based or normative. It will depend on the metric chosen to assess the alignment status of financial flows and stocks and whether the financing could be mapped to the final use of proceeds.

- For metrics relating to instruments with known use of proceeds (in monetary value or ratio, such as the green brown ratio), scenario-based investment and financing pathways can be used.
    - For example, desirable green-brown ratio at time horizon T can be derived from investment roadmaps based on widely recognized scenarios. For instance, the IEA NZE 2023 suggests a ratio of 10:1 by 2030, accounting for both energy supply and demand [2023]. When considering only the supply side, this ratio could be projected to rise to an average of 6:1 in the 2030s and 10:1 in the 2040s, according to BNEF, based on a set of seven scenarios (from IEA, IPCC and NGFS) [2024].
    - Similarly, primary financing amounts to climate-aligned activities and its evolution through time (through loans, project finance, infrastructure…) can be compared to net zero investment pathways.
    - It is more difficult and tenuous to do so for primary financing through general use of proceeds instruments, such as corporate loans, as well as secondary financing. It is theoretically possible to compare the final counterparties' CAPEX to investment pathways – but it is impossible to attribute these CAPEX levels, and their evolution, to the financiers [PSF, 2024].
    - See below for a zoom on investment and financing pathways.

Table 10 - Summary of metrics relating to instruments with known use of proceeds and examples of scenario-based investment and financing pathways

METRIC	TYPE OF ALIGNMENT METRIC	ALIGNMENT ASSESSMENT
Green financial asset/ investment ratio (covering only known use of proceeds instruments and/or estimated for unknown use of proceeds instruments)	Relative, known use of proceeds (real or estimated)	Scenario-based, recalculating green CAPEX/OPEX revenue intensity using scenario data. • Examples include IIGCC & Vivid Economics [2022] for the electricity generation, fuel and road mobility sectors in the NZE2050 scenario. • According to IIGCC & Vivid Economics, deriving alignment benchmarks from existing investment trajectories for economy-wide green ratios is not possible given the focus of these trajectories on energy-intensive sectors. • An alternative consists in using milestone-based benchmarks. See below.
Green brown ratio	Relative, known use of proceeds (real or estimated)	Scenario-based, recalculating the ratio using scenario data. • Example considering both energy supply and demand: the ratio is projected to reach 10:1 by 2030, as indicated in the IEA NZE scenario [2023]; • Example when focusing solely on energy supply: the ratio is expected to increase to an average of 6:1 in the 2030s and 10:1 in the 2040s, according to BNEF, based on an analysis of seven scenarios (from IEA, IPCC and NGFS) [2024].
Amount of primary financing to sustainable counterparties with known use of proceeds or counterparties with unknown use of proceeds, using counterparty-level green CAPEX/OPEX data.	Absolute	Scenario-based, using investment and financing pathways. In theory, the % change in financing amount can be compared to those embedded within investment and financing roadmaps.

- For relative metrics, expressed in scores (e.g. portfolio Implied Temperature Rise rating), % alignment (e.g. taxonomy-alignment) as well as categories (% flows to net-zero-aligned, % flows to transitioning financial assets...), it is currently only possible to use a normative approach [also called milestone-based approach in SBTi, 2024].

    - **Normative benchmarks are "based on the adoption curves expected to drive change in the real economy"**. These are not "inherently science-based, given the benchmarks cannot be directly derived from climate science. These future performance levels should instead reflect the major milestones required in the economy for the largest source of global emissions to transition as soon as possible". Still, some scenarios, such as IEA NZE contain milestones for technology adoption (e.g., net zero electricity by 2040) from which milestones for financing benchmarks may be derived, making them, to some extent, science-based.

- **These normative benchmarks take the form of "reaching X% of financing allocated to climate-aligned counterparties and/or instruments by year Y"**. They have been declined at sector-; asset-class; financial service level. A yearly percentage change in financing can then be derived – assuming a linear or other type of pathways (e.g. S-shaped, stairways, or logarithmic).

No research exists to the authors' knowledge on best practices de design normative benchmarks. For example, what should be the shape of the curve? Linear curves are easier to comprehend, yet a large part of net zero investments need to occur within the next decade, according to net zero investment and financing roadmaps (see below). Similarly, should different curves be built depending on whether the financial flow relates to net-zero, enabling or transitioning financial assets? On the near-term, financial flows should increase rapidly towards transitioning and enabling financial assets. On the long-term (2040, 2050), the focus should be on net-zero achieved financial assets.

Table 11 - Summary of relative metrics and examples of normative benchmarks

EXISTING METHODOLOGY/ GUIDELINES	NORMATIVE BENCHMARKS
EU PSF report on EU-Taxonomy alignment Benchmark [EU, 2023]	At least 5% point increase per annum in Taxonomy-aligned CAPEX, starting from 5% points above the weighted average of the investable universe, to reach 100% prior to 2045, starting from currently low levels globally (c. 5%).
ACT Finance [ACT Finance, 2024 & 2024]	• One of the components of the financial flow trend indicator (INV/BAN4.1) is the distance and historical trends of financial flows to climate-aligned counterparties vs an ideal share. The Ideal Share is 100% by 2030 for all sectors, except O&G (2025). • It is based on the idea that "there is a commonly and widely accepted milestone of 2030 with a target of reducing at least 50% (55% in Europe) of its fair share of emissions (comparing to 1990), the ideal year to reach the ideal aligned share is set as 2030. Indeed, as first key results shall materialise by 2030 it is assumed that all sectors should already be at least on a transition phase."
SBTi FINZ July 2024 consultation draft [SBTi, 2024]	• Climate-alignment targets: >95% of climate-aligned financial flows by year T • The target-setting timeline and target year requirements vary depending on the asset class (limited vs reasonable influence) and sector (high-climate impact). • T = 2030 for Reasonable influence/higher climate impact; 2040 for others. • A difference can be made between OECD and non-OECD. • How climate-aligned financial flows are defined varies through time, with an increasing focus on net-zero achieved financial assets towards 2050.

It is important to note the exploratory nature of this work. Little research has been done on financial flows alignment benchmarks up to now. Further research is needed on the topic to develop sound pathways and guidance that can serve as a robust compass for capital deployment and allocation.

A zoom on scenario-based benchmarks

To assess whether financial institutions provide, or are projected to provide, the right level of capital to support the transition, capital deployed metrics can be compared to scenario-based investment and financing roadmaps. In addition, the measure of an absolute amount of green financing and the gap to what it would need to be under a net zero pathway is also a crucial indicator for policy makers to fine-tune regulation and ensure more support is given to meet the global net-zero financing budget. Further granularity on what makes the magnitude of green financing, e.g. at sector, country, actor or financing instrument levels, clearly enhance the policy makers' ability to efficiently adjust their support.

Notably, it is important to distinguish between investment roadmaps and financing roadmaps. Investment roadmaps define the level of CAPEX needed for the transition to happen. Financing roadmaps further allocate investment needs across different actors, such as corporates, financial institutions, households and governments.

1. **Several investment roadmaps, for example based on the NGFS or the IEA NZE scenarios, are readily available to define the level of CAPEX needed to follow the selected transition path.**

The investment needs estimates to meet a successful transition to net-zero global GHG emissions by 2050 have tripled over the last ten years, rising from $3.5 trillions annually in the IEA 2016 WEO (World Energy Outlook) report McKinsey ($275 trillion in total between 2021 and 2050) [2023]. These estimates vary according to the source. For example, based on Vivid Economic analysis, GFANZ mention 125 trillion in total based on the IEA 'Net Zero by 2050' and the Food and Land Use Coalition (FOLU) "Growing Better" report, 32 trillion over the next decade, of which over 70% could be provided by the private sector [IIGCC & Vivid, 2022].

At a European level, the EU estimates a total investment need of around EUR 1.6 trillion per annum until 2030 to meet the Green Deal environmental objectives, would represent almost 40% of total growth investments in the EU [PSF, 2024]. The EU further estimates the investment gap at EUR 620 billion, a 65% increase from current investment levels EUR 940 billion according to the European Commission figures [PSF, 2024].

Roadmaps give different investment needs, due to differing modelling choices, perimeter and assumptions (e.g. relating to technology maturity). In addition, as put by the PSF, "bottom-up approaches [to financing roadmap construction', based on country-level needs (incl. from national plans) are hard to reconcile with more top-down approaches [...]." [PSF, 2024].

2. **A number of these investment roadmaps include an additional layer of analysis, allocating investment needs across actors** (government, corporations, households, commercial FIs, institutional FIs...). The pocket allocated to FIs only relate to investments into the real economy, through project/infrastructure finance. This is a first step towards estimating the type of financing capital needed for the transition.

For example, within a supportive political and economic environment, the McKinsey estimates that private financial institutions could facilitate as much as 50% of net-zero investment need (about $3.5 trillion of annual financing until 2050), two third of such scenario financing being provided by commercial banks and a third by asset managers, private equity, and venture capital funds.

3. **Turning investment roadmaps into *full* financing needs roadmaps (including investments into corporations, governments, loans to households that themselves invest into the net zero economy) would require two further steps: 1. Breaking down CAPEX volumes by type of capital based on the technology development stage; 2. Connecting capital needs to an ownership and financing structure [2° Investing Initiative, 2017]**. This would help have a rounded view of whether financial institutions provide the necessary capital to 1. Real economy assets and 2. Other actors that themselves finance real-economy assets (governments, households, corporations etc). The Climate Policy Initiative published a framework to do so in 2024 and is planning to test it on select geographies and sectors [CPI, 2024].

Tracking capital deployment towards net-zero contributing investments (both directly and indirectly) requires a complex assessment that should include portfolio analytics, investment horizon and risk-return considerations, impact measurement, incentives mechanisms such as tax credits, subsidies and blended finance engineering.

STEP 4

AGGREGATING THE RESULTS

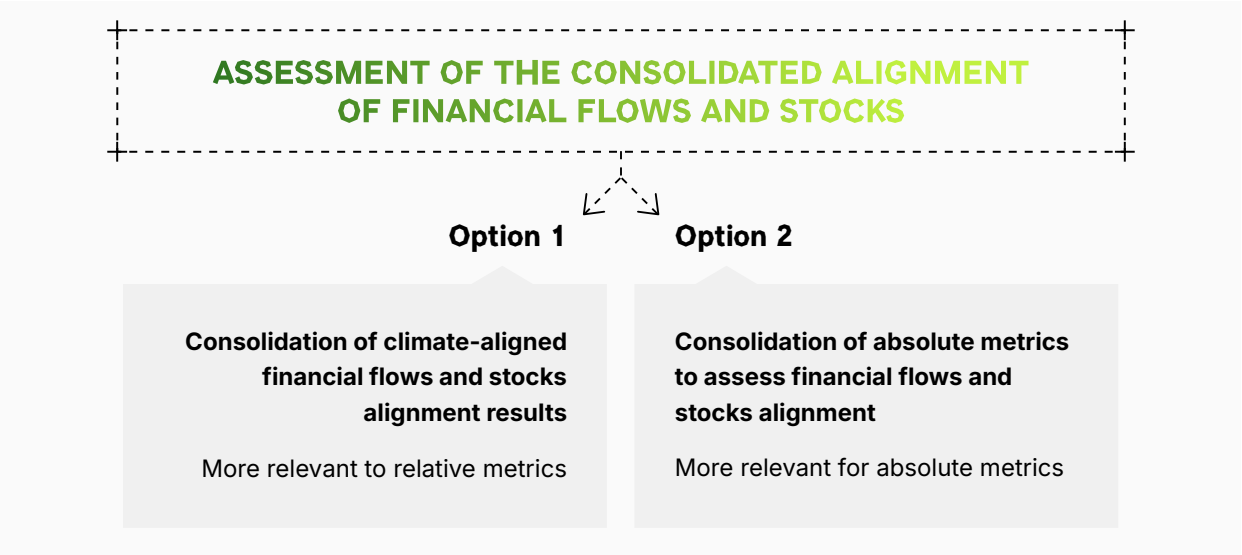
Unlocking climate-aligned financing requires different types of capital since different asset classes and financial instruments are better suited to different types of financing applications, considering financial asset sizes, technology maturity, project-level characteristics and time horizons.

At the same time, there is no single alignment assessment approach that exist across asset classes, let alone climate-aligned financial flow pathways.

All asset classes and financial instruments should be on the right path to net zero in an aligned economy – the "over" alignment of one asset class cannot compensate for the "under" alignment of another.

Taking the above into account, depending on the approach taken to map climate-aligned financial flows and stocks, the assessment of their alignment can either be done at 1. the financial flow/ stock level or at 2. the consolidated level directly.

Figure 13 - Assessment of the consolidated alignment of financial flows and stocks



Consolidation of alignment results at the financial flows and stocks level

Alignment can be assessed at the financial flows and stocks level first, (e.g. counterparty, sector, asset class, and instrument) and the results consolidated at a higher level (e.g. asset class, global portfolio, group of financial institutions…).

For example, the Alignment score of financing activities could be equal to the (weighted) average of the listed equity, green bonds, corporate bonds, private equity investments alignment scores.

Whether specific financial flows and stocks are considered as aligned can be assessed using capital deployment or allocation metrics, normative or scenario-based benchmarks as described in previous sections.

Financial flows and stocks alignment metrics could be weighted to derive the consolidated alignment score at the chosen level of aggregation based on:

- Financing value (e.g. value of equity AUMs). Here a choice would need to be made between market cap...
- Emissions (e.g. emissions of equity AUMs). Here, one could use financed emissions, total emissions, emission intensity, etc.
- Exposure to climate relevant sectors (climate-relevance could be based on both magnitude of GHG emissions and decarbonization/carbon abatement potential). Several frameworks list climate-relevant sectors (SBTI FINZ high-impact sectors, NZAOA, IIGCC...).
- Characteristics of the methodology used to assess financial flow alignment for this specific asset-class. For example, more weight could be given to asset classes whose methodology to assess alignment is the least uncertain/most consensual/with more real data available. This is the approach of ACT Finance [2024a, 2024b]. that use methodology maturity matrices in certain of its indicators' computation.
- Type of asset class and its link to the real economy. One could be tempted to attribute less weight to alignment of secondary market instruments, for example leveraging research on investor impact mechanism and evidence level [I4CE-ILB, 2021, based on Kölbel et al., 2020]. Yet, both are interconnected. As put by the PSF, "Analysis of the secondary markets remains of interest, however, to indicate appetite for investing in various activities and the resulting impact on cost of capital. In addition, secondary markets are important to free up capital for new investments in primary markets." [PSF, 2024].
- Type of financial service. For example, PCAF [2023] recommends a 33% attribution factors for facilitated emissions – meaning in practice that facilitated emissions would be cut 66% vs financed emissions on the same counterparty. Similarly, SBTi FINZ [2024] suggests classifying financial service into influence bands – FIs are given more time to set targets to limited influence activities.

Further research is needed to investigate whether a specific weighting should be applied and if so which approach would be more satisfactory. For example, there has been some critics around the PCAF 33% attribution factor for facilitated emissions.

Consolidation of absolute metrics to assess financial flows and stocks alignment directly at the consolidated level

Another option for absolute metrics consists in summing the value of climate-aligned financial flows and stocks across asset-classes, then assessing their alignment with net-zero investment and financing pathways – where possible sector-specific.

In the authors' view, it may be necessary to segment the assessment into two buckets, one regrouping primary new investment with known use of proceeds – generally captured in net zero investment and financing pathways (e.g. project finance, infrastructure), and the other regrouping investments in entities (such as corporates & governments) that themselves invest in the real economy.

The comparison between climate-aligned financing amounts and the net zero investment and financing needs to derive an alignment metric is likely to be very tenuous. To the authors' knowledge, this does not exist for "pockets" of financial institutions – only at the global economy level. It may pose complicated questions in terms of budget allocation for example.

Another option consists in comparing the trend in climate-aligned financing to ensure it is adequate. This is paramount to the contraction approach in emissions'-based methodologies with all the known caveats – except that here it relates to capital deployment. Research on deriving a "fair" contraction/expansion methodology may be useful in this context.

The derived sector-specific alignment scores could then be weighted – using some of the approaches discussed.

4.3. Examples of existing methods that follow the Financing alignment philosophy to assess the consolidated alignment of a group of financial institutions

Few examples exist of this type of approach. Most focus on climate solutions or incompatible assets – few on transition assets. This section highlights two, focusing on the output of the consolidated Financing alignment assessment and the approach to perform alignment.

Table 12 summarises the key findings.

Table 12 - Summary of key publications for Financing alignment assessments

PUBLICATION	CONSOLIDATED METRIC	CONSOLIDATED METRIC
Macro estimates – CPI [2023]	Maps direct financial flows to climate solutions at macro-level without attributing to individual FIs	No alignment assessments (no attempt to assess whether financial flows to climate solutions grow at the right pace and scale vs investment/ financing scenarios)

CPI – Net Zero Finance Tracker (NZFT): Impact dimension on financial flows [2024]	Maps direct and indirect financial flows to climate solutions, incompatible assets and transitional assets across groups of FIs (type of FIs, by country and coalitions)	No alignment assessments (no attempt to assess whether financial flows to climate solutions grow at the right pace and scale vs investment/ financing scenarios)
PACTA COP	Maps current portfolios (lending and investing – corporate bonds and loans) towards assets transitioning at the right pace and scale across the selected jurisdiction.	Alignment assessment embedded within the mapping (at asset, sector and portfolio-level).

The ACT Finance approach [2024a, 2024b] is also described as part of this section – although it focusses on a single institution rather than the consolidated level, it suggests an interesting and innovative approach to assess whether the participating financial institution is redirecting its financial flows and stocks to climate-aligned assets.

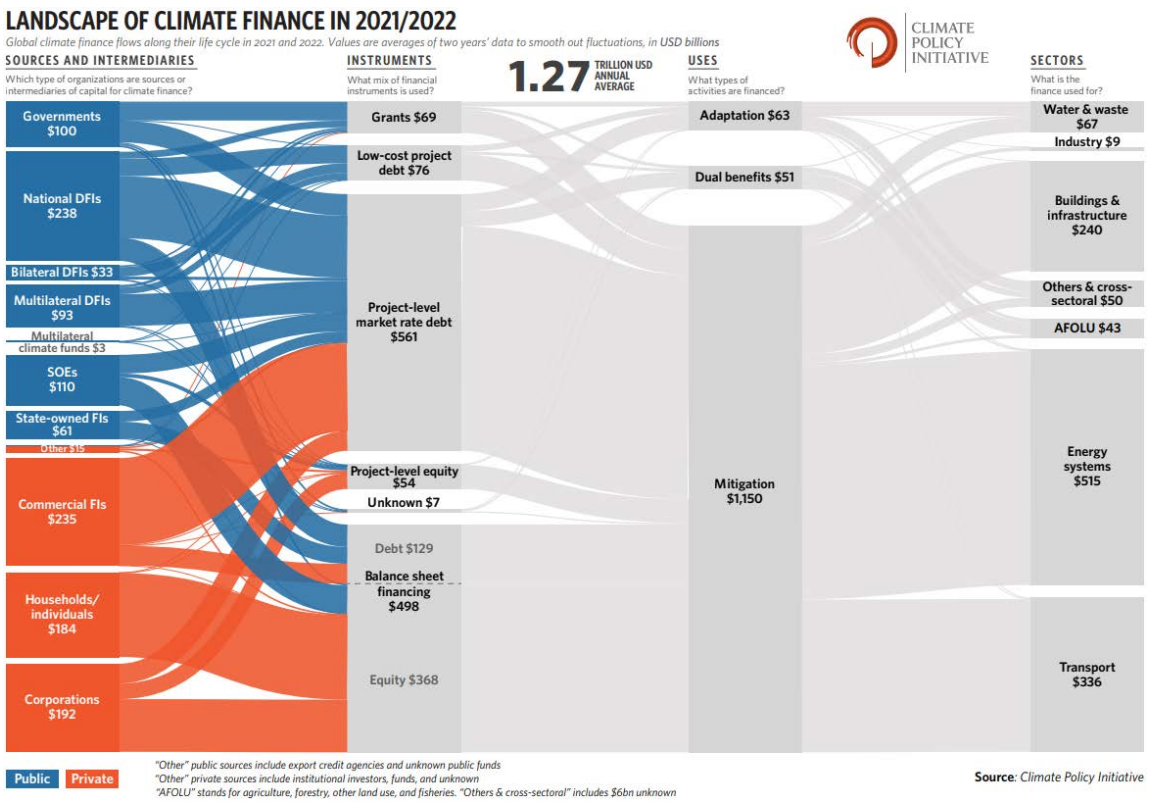
In addition, the Sustainable Platform draft "monitoring framework and a set of indicators that will allow an assessment of the alignment of capital flows in the EU's financial sector with the Union's net zero targets" [PSF, 2024] is described. While it is still a draft, it suggests interesting indicators to monitor the reallocation of capital across a wide range of actors and instruments.

CPI

For almost a decade now, Climate Policy Initiative (CPI) is one of the multiple actors that has been compiling a wide variety of sources to track the magnitude of climate finance. CPI [2023] estimates that green financing flows at USD 1.27 trillion per year on average in 2021 and 2022.

- Notably, these estimates differ from those of other actors (e.g. Eurostat Green Deal Financing) because of diverging scope and assumptions.
- CPI tracks primary investments. Secondary market transactions are not included because they do not represent new investments but rather "money being exchanged for existing financial assets".
- It compiles multiple datasets such as BNEF on project-level renewable energy finance, CBI data on green bonds or the IEA review of world energy investment amongst others.

Figure 14 - CPI green finance landscape and financing channels as of 2022 [CPI, 2023]



To be noted:

- Relates to mapping investment flows;
- Consolidated at the: global, source of capital (type of actors), type of instrument, mitigation/ adaptation, sector-levels;
- Include only primary flows;
- No alignment/gap analysis, in other words whether climate finance grows at the desired rate and scale through time.

In parallel, the dimension of impact alignment is one of the themes addressed by the CPI NZFT [2024]. Given that the financial industry directly affects the real economy through its investments in climate solutions and carbon-intensive financial assets, CPI has chosen to consider not only direct investments but also their indirect influence on the real economy through these metrics. Impact is evaluated using quantitative indicators to measure changes in financial stocks or flows related to activities that either promote a net zero transition (e.g. clean energy project-level financing or corporate-level green lending) or hinder it (fossil fuel project-level financing, exposure to misaligned financial assets (%) or exposure to fossil fuels (%) and beta portfolio emissions) [NZFT, 2024].

Sustainable platform

Building from the landmark work of Climate Policy Initiative and other regional organisation such as I4CE, the EU has launched an initiative to design “a robust monitoring framework and a set of indicators that will allow an assessment of the alignment of capital flows in the EU’s financial sector with the Union’s net zero targets” [PSF, 2024].

The EU Platform proposes a methodology that focuses on private capital expenditures (seen as an advanced indicator to assess the distance to filling the investment gap) in real economy entities (32 million companies in the EU generating a net turnover of EUR 38 trillion in 2023) but also on the capital markets financial flows using for example Green Asset Ratio and ESG Pillar 3 data for loans, instruments claiming certain sustainable features (green bonds, SFDR funds), and activity data of the underlying entity for general-purpose financing instruments (bonds and equity).

Figure 15 - The EU PSF conceptual framework for assessing green financial flows [PSF, 2024]

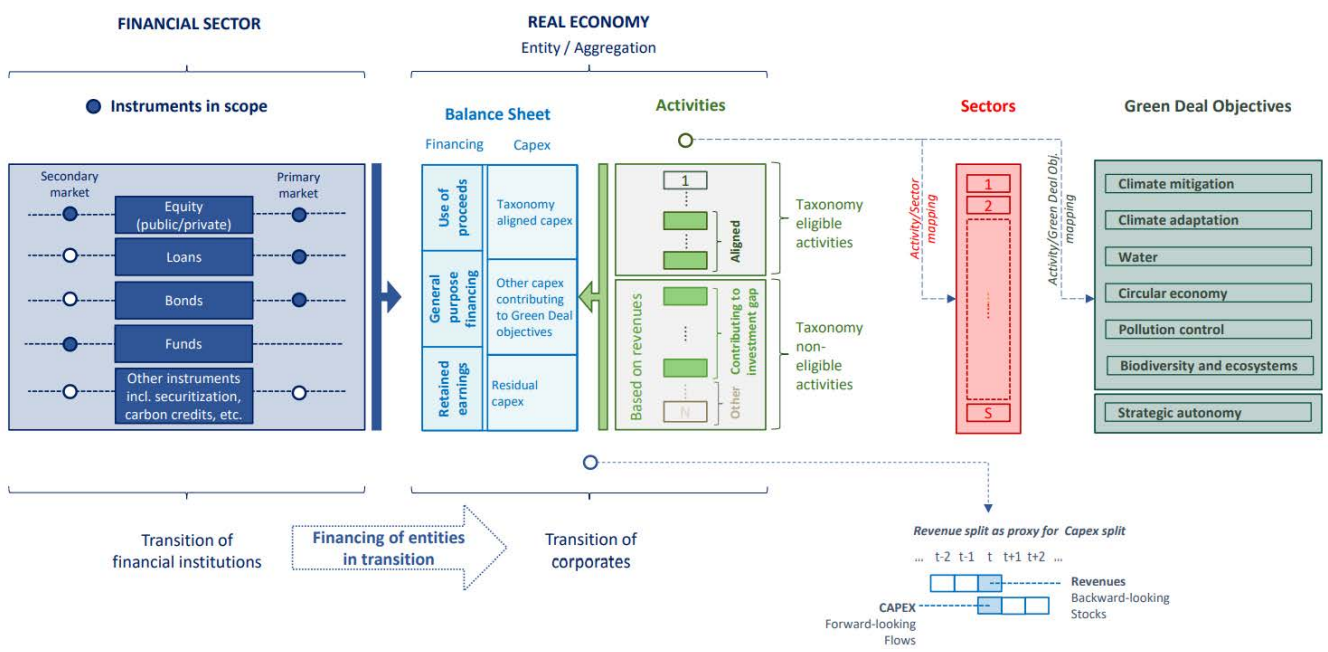


Table 13 - Monitoring metrics suggested by PSF based on capital flow typology

TYPE OF CAPITAL FLOW	SUGGESTED MONITORING METRIC [PSF, 2024]
Real economy	• Taxonomy aligned capital expenditures (CAPEX). • CAPEX contributing to environmental objectives, not examined or included in the Taxonomy. • An assessment of entities in transition. • CAPEX by entities in transition.
Financial sector primary market	• General purpose financing (bonds and equity) will be characterised based on green CAPEX of the real economy entity. • Use of proceeds financing (bonds) will be measured based on the labelling of the financing. • Loans will be measured based on banks' own green criteria as well as the Green Asset Ratio.
Financial sector – secondary market	Secondary market instrument analysis will rely on disclosures and labels to assess market appetite for financial assets (funds) with sustainability features
Extra layer: transition	Financing instruments of corporates in transition. Transition of financial institutions

To be noted:

- Relates to mapping financial and investment flows;
- EU perimeter;
- Unclear how the data will be consolidated (exploratory framework for now);
- Include both primary and secondary financial flows;
- No alignment/gap analysis (for now?).

PACTA COP

The objective of the PACTA COP program is "to measure the alignment of the entire financial sector as well as individual participating institutions".

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 [2° Investing Initiative, 2021].

Figure 16 - Range of consolidated assessments conducted [2° Investing Initiative, 2021]

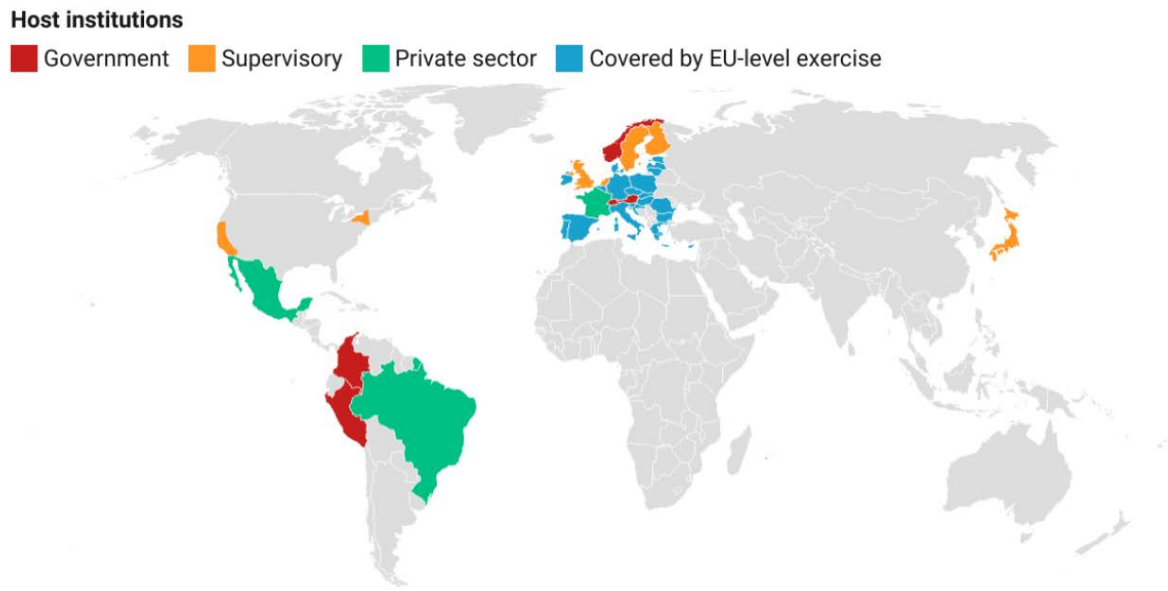
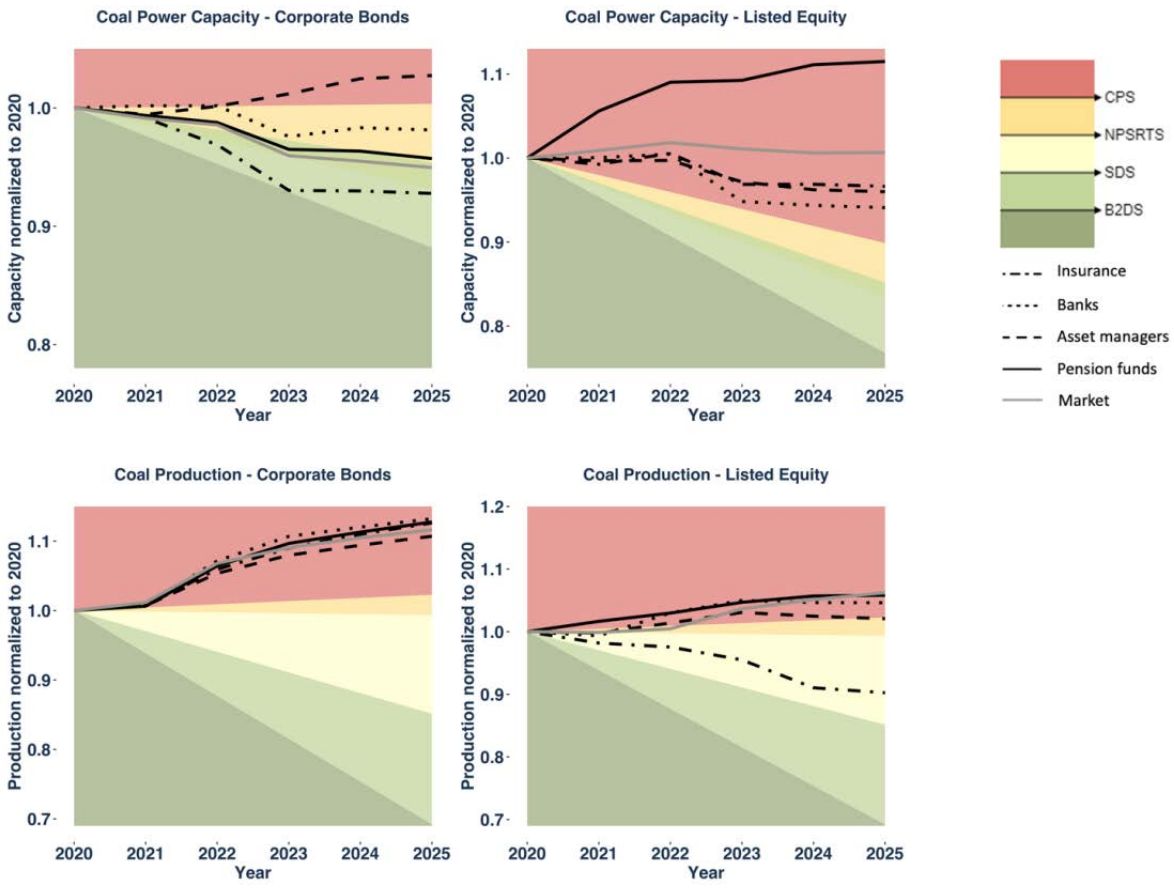


Figure 17 - Example outputs of PACTA COP [2° Investing Initiative, [2020]



ACT Finance specific criteria related to financing

- The ACT Finance methodology includes three criteria relative to net zero financing alignment, in both its investment and banking methodology: Engagement targets (1.4), Financing targets (1.5), and Financial Flow Trend (4.1) [ACT Finance, 2024a & 2024b].

- The Engagement Targets criteria relates to the strength of the fossil fuel and deforestation policies, as well as the engagement activities towards counterparties in "transition". FIs are assessed based on the quality of their approach towards these counterparties (perimeter, timeline, coverage, quality of the transition definition used by the FI, monitoring...).

- The Financing Targets criteria assesses the robustness of the FI roadmap on climate solution financing, to avoid blurry targets such as "increase by X% investments towards sustainable solutions". Criteria include the metric used, timeline, scope, monitoring...

- The Financial Flow Trend criteria is one of the most technical criteria of the methodology. It covers both the financing of fossil fuels and counterparties in transition. The trajectory of an FI's financial flow towards counterparties in transition is assessed through both its current share distance to 100% and the trend over the past three years compared to the expected trend to reach 100% by 2030 (2050 for oil and gas). Notably, this can be calculated at either the sector, asset-class or global level, weighted to derive the FI-level score. The methodology acknowledges that the definition of what is a low-carbon/transitioning asset/company remains an open question and treat it through a preliminary assessment of the quality of the definition /standard used by the Financial Institution itself, the result influencing the final scoring (with schematically the idea that 20% of transitioning share with a 75%-quality definition "worth" 20%*75%=15% of scoring)

While ACT Finance methodologies apply at the FI-level only, some of the methodological principles, e.g. in weighting, could be used to assess the consolidated alignment of a group of financial institutions.

Reclaim Finance fossil fuel financing methodologies

Reclaim Finance has developed several methodologies to assess financial institutions' fossil fuel financing, focusing on both financial flows and policy commitments. Originally designed for FI-level assessments, these methodologies' weighting principles could be adapted for consolidated alignment evaluations across multiple institutions.

The Banking on Climate Chaos (BOCC) Report [2024] tracks fossil fuel financing by major banks since the Paris Agreement, analysing lending and underwriting activities across sectors, regions, and institutions. This dataset can inform consolidated assessments, measuring the share of fossil fuel financing within a financial group.

The Coal Policy Tracker [2024] and Oil and Gas Policy Tracker [2024] evaluate financial institutions' policy stringency on fossil fuel financing, assessing exclusions, transition conditions, and phase-out commitments. Their scoring frameworks could be leveraged to compare policy ambition across multiple FIs, ensuring alignment consistency.

The Sustainable Power Policy Tracker [2024] extends this approach to the power sector, assessing whether banks are redirecting financing from fossil-based to clean energy generation.

By integrating financial flow tracking and policy analysis, these tools provide a dual approach to assessing fossil fuel financing. Applied at a consolidated level, they help quantify collective alignment with global climate targets, particularly in evaluating whether financing restrictions lead to real-world fossil fuel phase-out.

4.4. Pros, cons and areas for further research

In theory, *Financing alignment approaches* appear straightforward and better suited as a "leading" alignment indicator [SBTi, 2024]. A benefit of this work on climate-aligned metrics is it can help bankers and investors to consider optimal options in the engineering of financing structures and attract new funding for these green investments such as use-of-proceeds constraints, binding decarbonisation covenants or creating specific investment vehicles for financial asset-based vs operational as seen in various project and infrastructure finance.

Yet, in practice and as shown in this section, there are several knowledge gaps that remain to implement robustly this type of approach:

1. No consensus exists on how to define "climate-aligned" financing and the best approach to take depending on the asset class or type of investment (primary/secondary, direct/indirect).

2. Most metrics rely on monetary data (either in its construction or final form) – which is sensitive to market fluctuations and whose change may not adequately reflect the change in climate-aligned financing.

3. There are few tools available yet to define and characterise capital allocation distance to any financing target, whether at a sector or country level. Green financing guidance remains rare within financial institutions net zero communication package.

4. The approach necessitates making a range of assumptions to fine-tune the different level of influence that any dollar can have through various contexts, such as the nature of financial instruments and the type of financial asset financed.

Ideally, any investment should be assessed not only on what it costs, but also what it brings to the net-zero journey. Yet, isolating the effect of a financing decision is however challenging. How does green financing translate into production? How fast, how well, how much any dollar invested produces decarbonisation outputs is a necessary parameter to assess the impact and effectiveness of net-zero financing. Further statistics built on the EU Taxonomy corporate disclosure should demonstrate that every dollar invested in green aligned capex can produce very different green revenues outputs.

Finally, there is no equivalency methodology (to the authors' knowledge) to translate financial flows and stocks alignment metrics into emissions trajectory data. This means that financial flows and stocks alignment assessments should be completed by an emissions-based alignment assessment to form a rounded view of whether a financial institution or consolidated group of financial institutions, is on a good track to achieve net zero.

In addition, advancing Financing alignment approaches to assess the consolidated alignment of a group of financial institutions would benefit from:

1. Developing consistent conversion metrics to link financial flows and stocks to emissions outcomes, which would allow better integration of financing and alignment targets. A starting point could be isolating emissions data from targeted flows/stocks where available.

2. Estimating how financial institution targets are likely to lead to real-world decarbonization rather than "virtual" reductions, which would entail analysing transition plans and considering the influence of "critical mass" effects on financial flows away from carbon-intensive financial assets.

3. Creating detailed real-world change assessment tools to enhance ex-ante and ex-post tracking, helping to clarify the impact of financial flows on decarbonization versus simple financial asset reallocation.

4. Investigating how normative benchmarks can best be built.

5. DEVELOPING FI EMISSIONS ALIGNMENT APPROACHES TO ASSESS THE CONSOLIDATED ALIGNMENT OF A GROUP OF FINANCIAL INSTITUTIONS

5.1. What are FI Emissions alignment approaches and why are they important?

FI Emissions alignment approaches have historically focussed on quantifying the past, current, and/or projected emissions associated with financial institutions' activities ("financed emissions" / "facilitated emissions") and whether these follow the expected decarbonization trend/respect the limited remaining carbon budget.

This family of approaches focus on the final objective of all climate-related financial efforts: reducing greenhouse gas emissions..

***FI Emissions alignment approaches* seek to answer the question: "are the emissions associated with financial flows evolving adequately in terms of rate and pace in relation to the global climate goals"?**

While *FI Transition alignment approaches* assess the transition-readiness of financial institutions, and *Financing alignment approaches* measure how financial flows are being redirected toward climate-aligned investments, *FI Emissions alignment approaches* seek to capture how the emissions linked to these financial flows and stocks evolve through time and compare to a given budget.

Historically, these approaches have been applied to assess the alignment of projected emissions at individual portfolio-level. In the authors' view, it is best to use them to assess ex-post emissions trends, as an accountability tool, when considered within a consolidated assessment approach.

Real economy, measurable reductions in emissions is fundamental to ensuring that transition efforts contribute to global climate targets. This family of approaches complements *FI Transition alignment* and *Financing alignment approaches* by focusing on their expected outcome.

Notably, emissions are consolidated at a higher level (e.g. asset class, portfolio, financial activity within or across multiple FIs) before assessing alignment. This differs from *Financing alignment approaches* where alignment is assessed at the lower level (e.g. asset class within an individual FI),

then the alignment outcome metric (such as an Implied Temperature Rating or a score) is aggregated. It also differs from *FI Transition alignment approaches* where emissions' alignment can be assessed as one of the multiple criteria of the assessment framework used to rate the transition maturity of an FI.

Aggregating emissions to the highest consolidated level possible before assessing alignment is better to maintain the link with the physical reality of the carbon budget. The issue is that depending on the emissions metric used, multiple counting may arise. In addition, the results may be harder to interpret and not as useful to drive action. For this reason, *FI Emissions alignment approaches* are better suited to monitor the outcome of F*I Transition and Financing alignment approaches*.

5.2. How are FI Emissions alignment approaches built?

In the authors' view, one can distinguish the following steps to implement *FI Emissions alignment approaches to assess the consolidated alignment of a group of financial institutions*:

1. Quantify (past and/or current) emissions related to financial institutions' services;
2. Emissions data can be projected but this should not be the primary focus of the assessment given the challenges that arise in doing so.
3. Consolidate emissions data at the desired level and assess alignment with decarbonization pathways.

It is important to note that in this report, when describing how Steps 1 & 2 can be performed, all the methodological options are primarily described considering their usability for Step 3.

Figure 18 - Summary of keys steps to implement FI Emissions Alignment approaches

FI EMISSIONS ALIGNMENT APPROACHES

STEP 1 QUANTIFY EMISSIONS RELATED TO FI'S FINANCIAL SERVICES

1. Choose an approach to quantify emissions

Use emissions data reported by FIs:

- *Example: Using emissions data reported for specific asset classes or sectors (e.g., corporate lending, equity investments)*

Recalculate emissions at FI-level using financial asset-level data:

- *Example: Recalculate the portfolio's emissions using portfolio composition and financial asset specific emissions data*

Estimate emissions using asset-class/sectoral data:

- *Example: estimating emissions for a bank's corporate lending by using sectoral averages*

STEP 2 PROJECT EMISSIONS (OPTIONAL AND SHOULD NOT BE THE PRIMARY FOCUS ON THE ANALYSIS)

1. Choose how to project emissions

Project emissions at financial asset-level:

- **Historical extrapolation, target-based methods, physical asset projections**

  Example: Using historical data to project emissions for an industrial facility over the next decade

Use portfolio emissions' targets of FIs:

- **Use decarbonization targets set by FIs to project portfolio emissions**

  Example: Projecting emissions reduction in a portfolio based on a bank's goal to reduce carbon intensity by 30% by 2030

Use portfolio-level projections (other than FIs targets):

- **Use alternative data sources or models, combining historical trends and macroeconomic scenarios**

  Example: Using regional and/or sectoral emissions scenarios to estimate future emissions for a diverse portfolio

STEP 3 CONSOLIDATE EMISSIONS AT THE DESIRED LEVEL & ASSESS ALIGNMENT

1. Decide whether to attribute emissions and attempt to eliminate multiple-counting

Across scopes:

- **Address overlaps between Scope 1, 2, and 3 emissions by using techniques like EEIO analysis or simplified methods** (e.g., dividing by three)

Across asset classes and financial services:

- **Differentiate metrics for listed equities, corporate bonds, and sovereign bonds; use allocation factors to prevent overestimation.**

Across financial institutions:

- **Manage overlaps when both Asset Owners and Asset Managers report emissions for the same financial assets.**

Do not attribute emissions and attempt to eliminate multiple-counting at any level:

- **Using financial metrics as attribution factors introduces volatility into the results:**

  Financial-based attribution can distort reported emissions due to market fluctuations, as increased financial values may misleadingly decrease attributed emissions, creating a false impression of real-world decarbonization.

2. Consolidate emissions and assess alignment

Choose an approach to build an alignment benchmark:

- **Convergence approach**: Emissions intensity of entities should converge to sector-specific levels (e.g., SBTi's SDA approach).
- **Contraction approach**: Apply consistent decarbonization rates across all entities, regardless of initial emissions levels (e.g., ACA approach).
- **Fair Share approach**: Allocate carbon budgets based on current and projected economic or physical output.

  Example: Using a 1.5°C pathway scenario to set target decarbonization rates for a bank's aggregated portfolio emissions.

Use year-on-year trend analysis to assess alignment:

Compare past and projected emissions trends against transition scenarios.

- Reflects real-world emissions changes; useful for tracking year-over-year decarbonization. But requires careful consideration of intensity vs. absolute emissions trends.

  Example: Monitoring annual emissions reductions across a portfolio to ensure alignment with a set pathway.

CONSOLIDATED FI EMISSIONS ALIGNMENT

STEP 1

QUANTIFY EMISSIONS RELATED TO FI'S FINANCIAL SERVICES

The first step is to retrieve, or estimate, the GHG emissions linked to FI's financial services within the assessment perimeter. There are several options to do this that in practice can be combined.

1. Use the emissions data reported by financial institutions themselves; and/or
2. Recalculate the emissions associated with an FI, or group of FI's, financial services;
   - **a.** Gather reported data, or estimate data, at financial asset level; and/or
   - **b.** Estimate the emissions at asset-class/financial service level.

Table 14 - Pros and cons of the different options to quantify the GHG emissions related to FI financial services

	PROS	CONS
Use emissions data reported by FIs	Saves time and resources. Leverage data that FIs are already required to report through various regulatory or voluntary frameworks.	Different FIs may use different hypothesis, e.g. aggregation methods, leading to inconsistent data that is difficult to compare or aggregate without recalculation. Some FIs may only report emissions for certain asset classes or sectors, leading to incomplete coverage of their overall portfolio.
Recalculate FI-level (or consolidated level) emissions data using financial asset-level emissions data (reported and/or estimated)	Provides a more granular view of emissions, allowing for greater precision and consistency when aggregating across institutions. Ensures that the same methodology is applied consistently across all financial assets, making the resulting data comparable across institutions and asset classes. When properly executed, this approach can cover all asset classes, sectors, and scopes (1, 2, and 3), providing a more complete picture of the FI's overall emissions. The bottom-up approach, using financial asset-level data, can reveal sectoral and regional differences in emissions, offering insights into specific areas where the institution may need to focus on emissions reduction.	Collecting and recalculating emissions data for each financial asset is resource-intensive and requires detailed financial flows data to the final counterparties, which can be difficult to obtain, especially for large or complex portfolios. The availability of reliable financial asset-level emissions data is often limited, especially for certain sectors or regions. This can lead to reliance on estimated data, which introduces uncertainty. Even when data is available, methods for estimating financial asset-level emissions may vary in accuracy. Scaling this method across multiple institutions can become challenging due to the complexity of gathering consistent financial asset-level data and ensuring methodological consistency across large datasets.

Recalculate FI-level (or consolidated level) emissions using asset-class and/or sectoral estimates	Using sectoral or asset-class averages makes this method easier and faster to implement, especially when direct financial asset-level data is unavailable. This approach can be applied at scale, making it useful for assessments involving many FIs or when working with large portfolios. Sectoral or asset-class estimates can provide useful insights into the emissions intensity of entire asset classes or sectors, offering a broad understanding of where climate risks may be concentrated. Sectoral and asset-class emissions data are often more readily available through databases or statistical sources (e.g., Eurostat), making this approach feasible even in the absence of detailed financial asset-level data.	Aggregating emissions at the asset-class or sectoral level sacrifices granularity, making it difficult to capture the specific emissions performance of individual financial assets or FIs. Relying on sectoral averages may overlook variations in emissions intensity within a sector or asset class, leading to inaccurate estimates, especially for portfolios with diverse holdings. As financial flows and market prices fluctuate, sectoral estimates may not fully capture the emissions reality of a FI's portfolio. This can lead to a mismatch between the estimated emissions and actual emissions outcomes. By not linking emissions to specific financial assets, this method may oversimplify complex portfolios and fail to capture the full scope of a FI's climate impact.

A zoom on using the emissions data reported by financial institutions themselves

This option consists in directly using the emissions data reported by the financial institutions themselves, as required in multiple voluntary and regulatory reporting frameworks.

While this appears to be the simplest, and least time-intensive approach, it is also unclear whether emissions data reported by FIs can be directly compared, let alone consolidated across financial institutions (see step 3).

Financial institutions generally report data at the asset-class level (e.g. emissions related to listed equity investments, emissions related to the lending portfolio etc) and at the sector level (generally for specific asset classes, but potentially across a range of asset classes). This consolidated data cover different perimeters, may have been calculated using different methodologies and give rise to different metrics.

A key challenge arises in ensuring that the reported data by different financial institutions is sufficiently consistent to be aggregated.

Several obvious checks can be done when gathering emission data reported by a financial institution: does the financial institution report carbon or GHG emissions data? Over which perimeter of its financial services? Over which scope of its counterparties (Scope 1, 2 and/or 3)? Using what metric? Where the data covers different perimeters, the analyst gathering the data can either restrict the perimeter of the analysis to the areas where financial institutions' reporting overlap or attempt to estimate the missing parts to extend the perimeter.

In addition, there are several more subtle differences that may arise within reported data. For example, reported emissions data may have been aggregated at asset-class and/or sector-level using different aggregation and attribution methodologies – meaning that even if the scope and metric is similar, the results cannot be compared, let alone consolidated.

Indeed, a range of aggregation methodologies exist to quantify emissions at portfolio (asset class and/or sector) level. The Partnership for Carbon Accounting Financials (PCAF) recommends the use of a standardised approach, known as the financed emissions view, which attributes emissions based on a financial institution's share of total debt and equity in the borrower or investor. However, financial institutions may also use other attribution factors or even aggregation formulas, such as Weighted Average Carbon Intensity (WACI).

A zoom on recalculating the emissions associated with a financial institution services

This option involves two types of data: 1. Reported and/or estimated emissions data at the level of the financial asset and 2. Financial flows and stocks data to understand the composition of financial institutions' portfolios. Since financial institutions often hold diverse financial assets across multiple sectors, the emissions data at the financial asset level needs to be linked to the financial flows and stocks associated with each financial asset.

This option yields comparable data, built on actual financial flows and stocks data, but is very time-intensive and difficult to implement, given financial flows data availability (see sub-section 4.4). In addition, reporting levels and quality varies across regions, sectors, types of financial assets etc, and relying on estimation methods may increase effort and uncertainty levels.

An alternative consists in estimating emissions directly at asset-class level, without going down to the individual counterparty level.

This method can, and has been, applied at the level of a single financial institution, and, in theory, at the macro level. It consists in mapping a financial institution financial flows and stocks towards asset classes, regions and/or sectors, then estimating what the emissions of these asset classes, regions and/or sectors might be. It differs from the above method in that it does not require mapping financial flows and stocks to the final specific financial asset (e.g. a specific company), but rather to asset classes, regions and/or sectors.

Certain data providers use this method to estimate the Scope 3, Financed emissions of specific financial institutions.

It remains to be tested whether this approach is feasible at the consolidated level directly. Macro economy statistical datasets provide information on the financial flows and stocks each year to different asset classes. This could be used to derive an estimate of the emissions linked with consolidated financial flows and stocks to specific asset classes, such as listed equity or corporate lending.

The potential issues with such a method are that is relies on an economic metric that may vary as financing structures and market prices fluctuates. In addition, when using sector or geographical emissions intensities' averages, the use of average emissions coefficients may not consider that some pockets (such as listed equity) may be less emissions intensive than their private counterparties. It depends on how the average emissions coefficients was derived.

STEP 2

PROJECT EMISSIONS DATA (OPTIONAL)

As explained in this report, the authors believe that emissions' alignment is best applied to ex-post emissions. In the context of consolidated assessments of a group of FIs, this type of analysis can be seen as an accountability mechanism, to ensure that the actions taken by FIs and the reorientation of financial flows and stocks lead to the right level, in pace and scale, of decarbonization.

Should one still wish to integrate projected emissions alignment, there are three options to project emissions data:

1. Project emissions at financial asset-level;
2. Use portfolio emissions' targets of financial institutions;
3. Use portfolio-level projections (other than financial institutions' emissions targets).

Table 15 - Pros and cons of financial asset-level emission projections and portfolio emission targets for FIs

	PROS	CONS
Project emissions at financial asset-level	Emissions projections at the financial asset level provide detailed insights into how specific financial assets or portfolios might evolve over time, allowing for tailored assessments and more precise alignment with climate goals. This approach can incorporate specific characteristics of individual financial assets, such as the emissions intensity of physical assets, or historical trends in emissions, offering a realistic snapshot of future emissions trajectories. Multiple methodologies can be used—targets, historical extrapolation, or physical asset-based projections—allowing for flexibility based on the data available for the financial asset in question. Target-based methods provide a forward-looking approach, allowing FIs to align with targets such as Science-Based Targets (SBTs), ensuring that future decarbonization plans are incorporated into the projections.	Projecting emissions, particularly for Scope 3 emissions, often faces data gaps, as financial asset-level emissions data might not be available or consistently reported. Projecting emissions far into the future is inherently uncertain, as it depends on assumptions about future regulations, technological advancements, and market conditions. When consolidating emissions data across multiple financial services (e.g., lending, equity investment), the risk of double counting becomes significant. When relying on emissions reduction targets to project future emissions, the credibility of these targets must be carefully assessed. Projecting based on overly optimistic targets could lead to inaccurate assessments. Collecting and managing financial asset-level data for emissions projections requires significant effort, particularly when historical data or detailed physical asset information is scarce.

Use portfolio emissions' targets of FIs	Using portfolio emissions targets directly reflects the decarbonization commitments made by financial institutions. Allows for forward-looking projections based on the specific emissions targets set by financial institutions, providing insights into how portfolios are expected to evolve in the future. Using targets set by FIs reduces the need to collect detailed financial asset-level data and project emissions for each individual financial service. This approach does not assume a fixed portfolio composition—FIs can meet their targets by adjusting their portfolio.	FIs may have varied target structures (e.g., absolute emissions reductions vs. intensity-based targets), making it difficult to compare targets across institutions or aggregate them into a consistent projection. Not all FI targets are equally credible or ambitious. Some targets may be set based on optimistic assumptions, making them difficult to achieve in practice. Many FI targets focus on specific asset classes or regions, potentially leaving significant portions of their portfolio unaddressed. FIs often disclose multiple emissions targets across different timeframes and scopes. There is a risk of overlapping or inconsistent coverage across asset classes or activities. Relies on the quality and transparency of FI reporting (if targets are not update regularly or lack robustness).

A zoom on projecting emissions at financial asset-level

Using this method assumes that portfolio composition is fixed. This method projects a portfolio's emissions using projections on how the underlying financial assets' emissions may evolve in the future.

Projecting emissions at the financial asset-level involves several methodologies, each offering distinct advantages and challenges, depending on data availability and the context of the financial institution's portfolio. GFANZ [2022] and the Alignment Cookbook 1 [ILB, 2020] deep dive into these.

- The historical extrapolation method uses past emissions trends to forecast future emissions. This approach is straightforward and relatively easy to implement. A key limitation is its backward-looking nature: it does not account for the needed paradigm, future changes in regulations, technological advancements, market shifts or efficiency gains that could significantly alter emissions.

- The target-based method uses the emissions reduction targets set by financial assets. This forward-looking method aligns directly with climate commitments, such as science-based targets. While it reflects the companies' intentions, the challenge lies in assessing the credibility of these targets.

- Capex and physical asset projections methods focus on the capital expenditures and infrastructure investments of companies. This method is useful for projecting emissions based on tangible assets, such as power plants or manufacturing facilities, providing a direct

link between emissions and operational plans. However, the long timelines associated with large infrastructure projects can delay the impact on emissions, and gaps in data coverage can reduce the accuracy of projections in certain sectors.

- The neutral emissions intensity approach assumes that the financial asset will maintain its current emissions per unit of output (e.g. revenue) over time. While simple, this method can be inaccurate, as it does not account for efforts to reduce emissions or changes in business models.

Lastly, combination approaches integrate multiple data points—historical trends, targets, CAPEX, and production forecasts—offering a more comprehensive emissions projection. While these methods can provide a holistic view of future emissions, they are also resource-intensive and require careful integration of diverse data sources to ensure consistency and accuracy.

For example, GFANZ recommends considering both backward- and forward-looking data when projecting emissions. A combination of historical emissions performance and forward-looking targets allows for a credibility-weighted approach to emissions forecasting. In this way, the emissions reduction target is assessed for both its ambition and likelihood of being achieved [GFANZ, 2022].

A zoom on projecting emissions at portfolio level

Another option is to directly use the financial institutions' targeted emissions. This method does not assume portfolio composition is fixed – financial institutions may meet their targets by either changing their portfolio composition or having the underlying financial assets decarbonize.

Using financial institutions' targeted emissions is fraught to the same comparability and harmonisation challenges.

This is due to the of standardised target structures, making comparisons between targets difficult. For example, a financial institution might set a target based on absolute emissions reduction or on intensity. The methodology for aggregating these targets into a consistent score or emissions projection can vary. In some cases, normalisation of targets can be applied, but due to the diversity in target formulations (scope, sector coverage, units, base years, etc.), the use of financial institutions' targets to project emissions must be approached cautiously to ensure comparability and transparency.

An additional challenge arises when financial institutions disclose multiple emissions targets, often across various timeframes, scopes, and asset classes.

- The CDP & WWF Temperature Rating Methodology provides a useful approach for dealing with this complexity. First, all disclosed targets are classified by scope (e.g., Scope 1+2, Scope 3) and timeframe (short-, mid-, and long-term). Then, a series of filtering steps is applied to select the most relevant target for each category. This includes prioritising targets with greater boundary coverage, selecting the latest available target years, and giving preference

to absolute emissions targets over intensity-based targets. When targets are aggregated, it is crucial to ensure that overlapping targets do not skew the overall emissions projection [CDP-WWF, 2020].

- The ACT Finance methodologies, both Banking and Investing, offer another solution to handle multiple targets. If a financial institution has targets across various geographies or asset classes, these are scored independently, and a weighted aggregation is performed to produce a final score that reflects the institution's overall alignment. ACT proposes to overweight sectoral targets, meaning that financial institutions with asset-class and/or portfolio-level targets cannot achieve the highest score on this criterion [ACT, 2024 & 2024].

Finally, one can attempt to project portfolio emissions using other approaches, in order not to rely too heavily on financial institutions' targets, which may, or may not be met. These include the approaches described to project emissions at the financial asset-level, except that these are applied at the portfolio-level. For example, macroeconomic scenarios can be used to project portfolio's emissions using a range of hypotheses.

For example, when considering a portfolio within the same asset class composed of indexes or funds with no transparency on the final counterparty, it is possible to project emissions by making certain assumptions and gathering relevant information, such as each index/fund's overall market value (or EVIC, if available) in dollars, along with its geographical and sectoral breakdown. Then, using this information:

- **Alternative 1**: Determine the geographical distribution of each index/fund. For example, if one index has 10% exposure to France, assume that 10% of the index's total value is related to France's emissions. Based on this assumption, and with a significant methodological consideration, follow the emissions' trends indicated by a multi-sector scenario covering France.

- **Alternative 2**: Determine the sectoral distribution of each index/fund. For instance, if one index has 15% exposure to the energy sector, assume that 15% of the index's total value is related to the energy sector's emissions. Based on this assumption, and with a significant methodological consideration, follow the emissions trends indicated by a global multi-sector or sector-specific scenario covering the energy sector.

- **Alternative 3**: Combine both geographical and sectoral distribution. For example, if one index has 10% exposure to France and 15% to the energy sector (assuming uniform sector representation across countries in the index), then 10% × 15% of the index's total value would follow the scenario's emissions trend for the energy sector in France, and so on.

The scenarios used for projecting trends can be one of the following: NDCs or Current Policies (the latter being more conservative and less volatile).

STEP 3

CONSOLIDATE EMISSIONS AT THE DESIRED LEVEL AND ASSESS ALIGNMENT

Various approaches can be used for consolidating emissions, depending on the underlying objectives of the alignment assessment. In the context of the CAPA project, the ultimate objective is to assess alignment with a transition pathway, in other words compare the past, current and/or projected emissions metrics with what it is expected to be under a 1.5°C scenario.

When consolidating emissions from counterparty to higher levels, multiple counting may arise, between scope 1, 2 and 3 emissions at the counterparty level, asset classes, financial services and even financial institutions. **Few satisfactory methods exist to eliminate multiple counting**.

1. **Across all scopes (Scope 1, 2, and 3)**: a company's Scope 3 emissions may overlap with another company's Scope 1 and 2 emissions, and vice versa. To mitigate this issue, various approaches can be utilized, ranging from simpler methods like dividing total emissions by three - to reflect one specific stage of the value chain - or using only Scope 1 and 2 when disaggregated data is available, to more complex techniques such as environmentally extended input-output analysis (EEIO), which aligns economic and production data with emissions, or advanced methodologies developed by certain providers as Iceberg Datalab.

2. **Across asset classes**: Several studies suggest that it is possible to aggregate climate metrics for listed equities with corporate bonds, but not with sovereign bonds. This distinction arises because the emissions of a country encompass the emissions of the economic actors operating in this country. A simplified solution proposed by the CIA methodology from Carbone 4 Finance involves using a factor derived from public revenue relative to GDP.

3. **Across financial services**: For example, there is a potential risk of double counting when assessing lending and financing products provided to the same company due to associated allocation factors. This means that if the same company receives both loans and investments from the same financial institution through different departments, it could lead to an overestimation of total emissions, as the lending department would account for emissions based on the loan amount, while the financing department would do so based on the investment value.

4. **Across different types of financial institutions**: For example, when both Asset Owners (AOs) and Asset Managers (AMs) invest in the same underlying financial assets, it can lead to emissions being reported by both entities.

As highlighted above, several vendors' have suggested approaches to get rid of double counting between scope 1, 2 and 3 emissions. Attribution factors promoted by PCAF to calculate portfolio-level financed or facilitated emissions also play this role, to eliminate double-counting between financial institutions' financing the same counterparty and between some asset classes, in particular corporate bonds and listed equity.

Yet, these approaches are incomplete – and do not allow to get rid of all the different types of multiple counting that may arise. In addition, using financial metrics as attribution factors has been criticized for the volatility in the results it induces: indeed, the use of financial attribution factors can consistently result in financial distortions and biased outcomes, with calculated emissions decreasing on paper due to the increase in financial value, rather than real-world decarbonization.

New indicators are being suggested that do not follow the attribution logic, thereby reducing the bias and noise introduced using financial metrics. The Indicators for Portfolio-Weighted Emissions Performances (I-PEPs) proposed by the Austrian Green Finance Alliance (GFA) is based on the total actual emissions (100%) of the associated holdings, reflecting real changes rather than distortions caused by financial factors. Think tanks such as Theia Finance Labs and Reclaim Finance are promoting this type of approach to avoid the bias caused by attribution [Theia Finance Labs, 2024; Reclaim Finance, 2024].

As put by Reclaim Finance in the context of a detailed analysis of banks target setting practices, at the financial institution level, such unattributed emissions metric "*may be unpopular as their baseline emission quantities would be many times higher than "financed" and "facilitated" emissions (and the same emissions would be counted by each of a company's bankers). But the point of carbon accounting and target setting for banks is not to ascertain an exact value for each banks' climate impact, but to develop standardized methodologies that first create incentives for banks to pressure their borrowers and clients to reduce real-world emissions, and second enable bank staff and other stakeholders to evaluate if their engagement efforts are causing emissions to fall.*"

In the authors' view, it may be better to use this type of indicator where the objective is to evaluate consolidated emissions alignment for monitoring purposes. Allowing for multiple counting is not an issue if care is taken in building the decarbonization benchmark against which consolidated emissions are compared to derive an alignment metric.

This means that only specific alignment assessment approaches can be used amongst the range of methodological options available at counterparty- and portfolio-level.

As discussed in multiple previous research, four approaches can be adopted at financial asset- and/or portfolio level to derive the decarbonization benchmarks against which to compare past, current and/or projected emissions levels to derive an alignment metric.

Table 16 - Four approaches for deriving decarbonization benchmarks at financial asset and portfolio levels

APPROACH	DESCRIPTION
Single scenario benchmark: **Convergence**	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 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.
Single scenario benchmark: **Contraction** (=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.
Single scenario benchmark: **Fair share**	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 is equal to the entity budget over a specific period. 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 considers 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
Warming function	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. In its use, it is akin to the contraction logic.

As highlighted by the GFANZ, the fair share approach effectively addresses a broad spectrum of the challenges arising from the other approaches, and allows for the best, direct link with the remaining carbon budget [GFANZ, 2022].

Yet, to apply a fair share logic at the consolidated level, it would either necessitate 1. Eliminating double-counting, including by using an attribution factor on the one hand, and using a financial metric to derive the budget from the global remaining carbon budget from the other, or 2. Recalculating from the bottom-up a consolidated budget against which to compare the consolidated, unattributed, emissions. In both cases, the calculation would be very time-intensive and prone to multiple uncertainties[8] .

Consequently, it is necessary to revert to a contraction and/or convergence logic, comparing past and/or projected emissions trend at the consolidated level with the expected trend as per the chosen transition scenario(s) and pathway(s).

An alternative for conducting an alignment assessment at the consolidated level is trend analysis.

A zoom on implementing an alignment assessment at the consolidated level using trend analysis

This involves several steps:

1. Choosing the emissions metric to weight;

When it comes to intensity metrics, a key concern is that the denominator can be artificially inflated, reducing the intensity without altering the numerator.

Economic intensity can be aggregated across sectors but is prone to biases due to fluctuations in the underlying economic variables, which can be distorted by factors like price volatility or currency exchange effects.

In contrast, physical intensity cannot be aggregated across sectors but more accurately reflects actual emissions trends. Nevertheless, it remains a normalized metric that must be interpreted cautiously in light of remaining absolute carbon budgets.

Absolute emissions metrics, on the other hand, may be more appropriate for aggregation as they are directly tied to the physical reality of the remaining carbon budget and are not subject to the biases introduced by normalization, whether economic or physical.

2. Weighting the chosen emissions metric by financial flows and stocks metrics to derive the consolidated, unattributed metric;

[8] At the portfolio-level, it is feasible (and considered best practice by GFANZ) to recalculate the portfolio-level budget based on the counterparty budgets.

3. Compare its past trend with the expected trend as per the chosen transition scenario(s) and pathway(s).

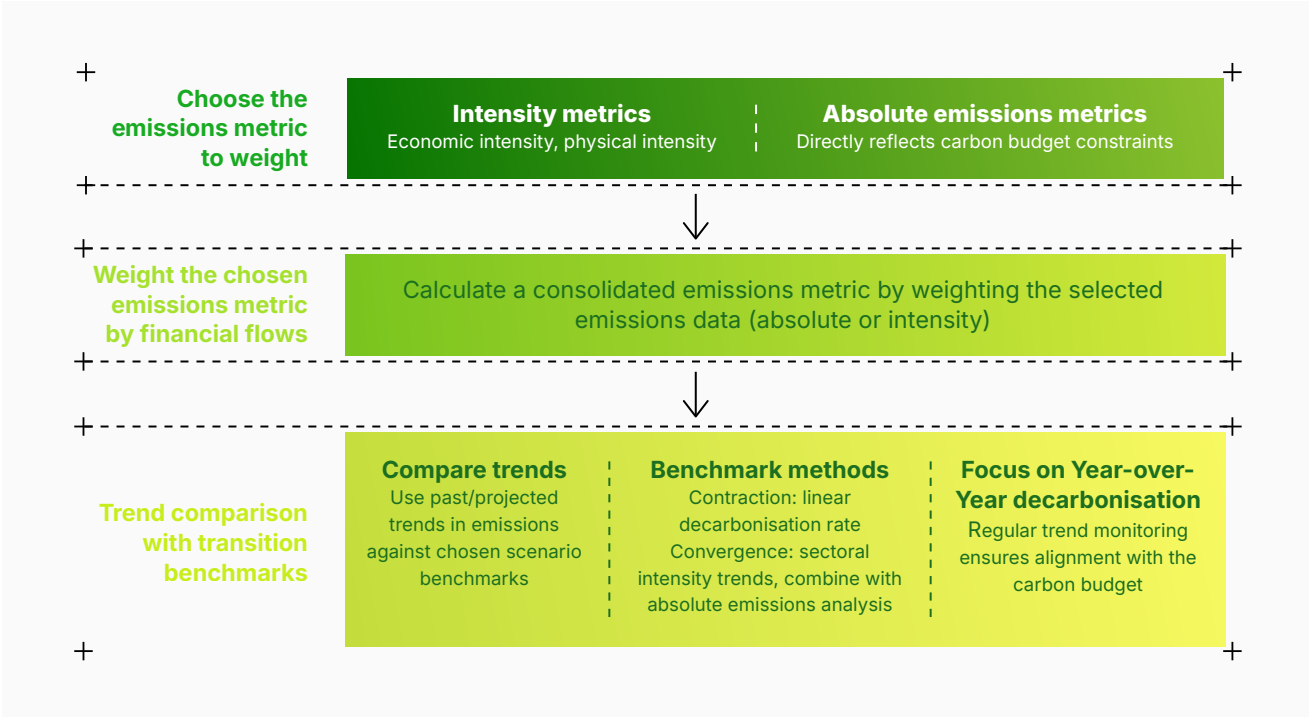
This can involve monitoring the decarbonization trend of a group of financial institution's absolute emissions, comparing it to a sector-agnostic benchmark based on scenario data and a contraction logic, where a linear decarbonization rate is assumed.

Alternatively, the trend comparison can be made using a benchmark based on scenario specific to sectors or geographic coverage, or a combination of both, also employing a contraction logic with a linear decarbonization rate tailored to those parameters.

The trend in weighted sectoral emissions intensity can also be assessed following the convergence principle – yet it should be completed with an absolute emissions trend analysis to check that the results are not artificially influenced by variations in the denominator beyond what is expected.

Finally, the focus should be on assessing **year-over-year decarbonization trends**, helping to ensure alignment with the carbon budget.

Figure 19 - Consolidated alignment assessment: emissions trend analysis and decarbonization benchmarking



5.3. Examples of existing methods that follow the FI emissions' alignment philosophy to assess the consolidated alignment of a group of financial institutions

Few examples exist of this type of approach. This section highlights two, focusing on the output of the consolidated FI Emissions alignment assessment and the approach to perform alignment.

Table 17 summarises the key findings.

Table 17 - Summary of key publications for FI Emissions alignment assessments

PUBLICATION	CONSOLIDATED METRIC	ALIGNMENT ASSESSMENT
NZAOA – The fourth progress report [2024]	Aggregation of the absolute financed emissions of members, by cohorts	Ex-post year-on-year trend analysis compared to a global decarbonization scenario (IPCC SR 1.5)
CPI – Net Zero Finance Tracker (NZFT): Impact dimension on emissions [2024]	Aggregation of the absolute financed emissions (reported, interpolated, and/or estimated) across groups of FIs (type of FIs, by country and coalitions)	No alignment assessments

The I-PEPs (Indicators for Portfolio-weighted Emission Performances) approach – developed by the Green Finance Alliance [GFA, 2024] - is also described in this section. It is a methodological document designed to guide financial institutions in aligning their portfolios with long-term climate goals. While it does not focus on the aggregation of emissions for a group of financial institutions, its insights can be useful in devising a consolidated alignment assessment methodology.

NZAOA Progress reports

The NZAOA's fourth progress report highlights the Alliance's requirement for members to disclose and report their absolute financed GHG emissions, with a focus on transparency and accountability. The report emphasises tracking absolute emissions reduction over time as a key metric of alignment with net-zero goals. In 2023, the total aggregated financed GHG emissions of members with set targets and reported data decreased to 254 million tCO2e from 278 million tCO2e in 2021, despite the growth in membership [NZAOA, 2024].

The report aggregates financed emissions data into "cohorts" based on the year members began reporting, allowing for a detailed analysis of emissions reduction trends within each cohort. However, the report does not provide detailed information on the methodology used for aggregating emissions data across members.

The report notes that "all cohorts recorded reductions of at least six per cent annually. This rate of reduction is in line with the 1.5°C-aligned pathway requirements. In other words, the Alliance's 81 members that have already set their intermediate climate targets have on average achieved incremental portfolio decarbonisation that, if replicated in the real economy, would likely lead to limiting global warming to 1.5°C. [...] The Alliance's work in attributing emissions has shown that these reductions are often largely a result of portfolio reallocations, shifting capital to more sustainable investments."

Yet, it notes that other factors beyond membership size and portfolio decarbonization may influence variation from one year to another.

Figure 20 - Absolute financed GHG emissions (excluding sovereign debt) of the Alliance members with intermediate targets for the December 2018-2023 period – from NZAOA, 2024.

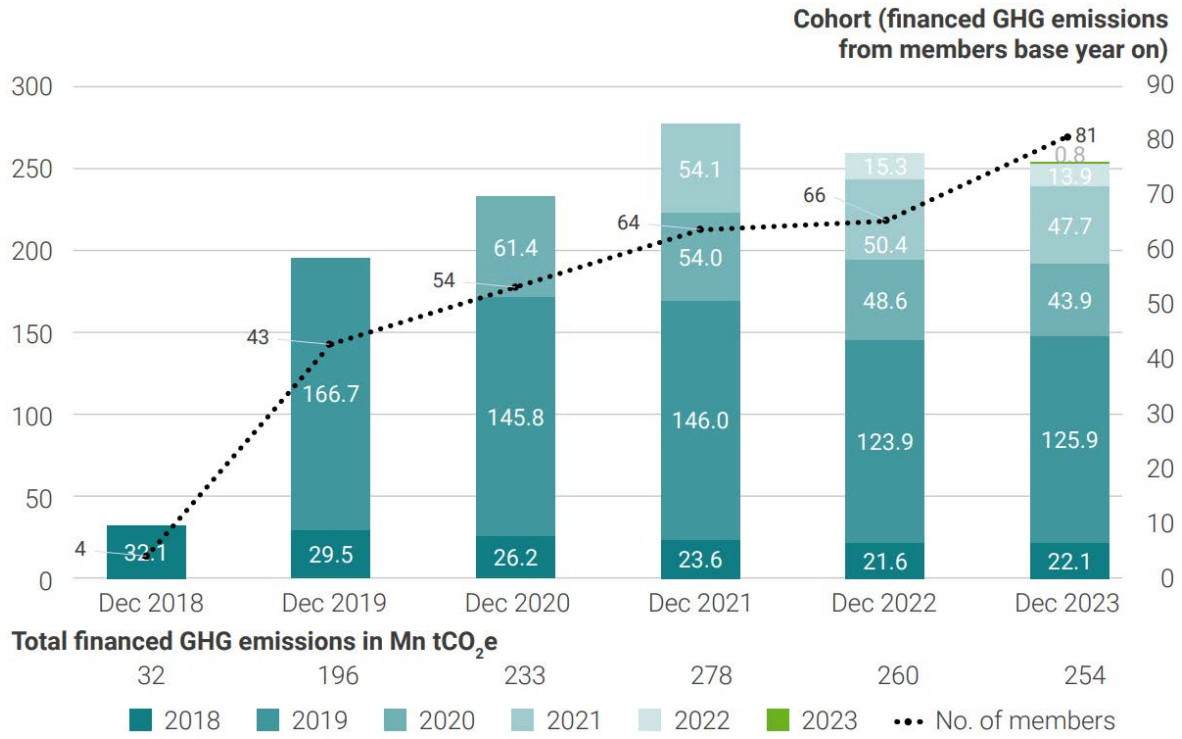
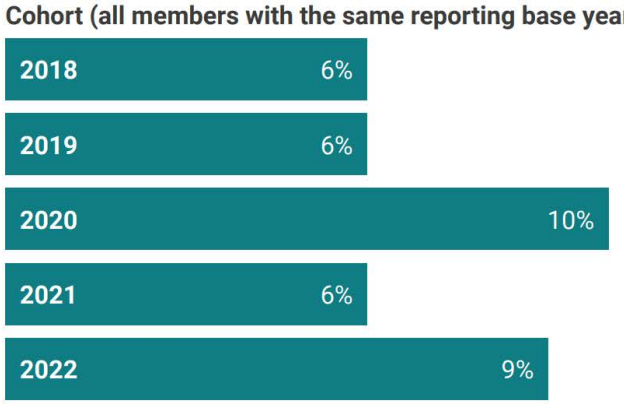


Figure 21 - Members' annual reduction of financed GHG emissions as of 12/2023, normalized by each cohort – from NZAOA, 2024.



Normalised annual reduction of financed GHG emissions by 2023			Total reduction
Cohort, members with base year:	2018	6%	31%
	2019	6%	24%
	2020	10%	29%
	2021	6%	12%
	2022	9%	9%

IPEPS Approach

The I-PEPs (Indicators for Portfolio-weighted Emission Performances) approach was developed by the Green Finance Alliance [GFA, 2024] as part of its "Climate Navigation Cockpit" framework, which is designed to guide financial institutions in aligning their portfolios with long-term climate goals. This methodology enables financial institutions to track the decarbonization of their portfolios using a portfolio-weighted approach. By focusing on absolute GHG emissions for corporate lending and investments, and physical emission intensities for project finance, I-PEPs provides a comprehensive way to measure progress toward reducing financed emissions over time.

The core feature of the I-PEPs methodology is its use of absolute emissions data for corporate assets (companies and countries) and physical emission intensity for projects. These emissions metrics are then weighted based on the proportion each financial asset or project represents within the financial institution's overall portfolio. This allows for a granular view at the sub-asset class level (e.g., equities, real estate, sovereign bonds), while also enabling aggregation at higher levels to track portfolio-wide emissions performance.

For each activity, such as investments or project finance, emissions performances of asset classes (e.g., real estate, sovereign bonds) are aggregated based on their proportion within the total volume of that activity. This ensures that the final emissions metric accurately reflects the relative size of each asset class in the overall portfolio.

At the total portfolio level, the same bottom-up approach is used, with each asset class weighted according to its share in the total portfolio. The aggregated portfolio-weighted emission performance (APEP) provides a comprehensive view of the institution's decarbonization progress, simplifying performance communication and helping institutions align their actions with climate goals.

CPI NZTF – impact dimension - emissions

The Net Zero Finance Tracker (NZFT) constructed by the Climate Policy Initiative (CPI), utilizes quantitative metrics to evaluate the impact of financial institutions on the real economy. Among them "portfolio emissions" that measures the financed emissions of financial institutions, representing emissions associated with their investment portfolios [CPI, 2024].

This indicator assesses financed emissions at both the individual financial institution level and at an aggregated level across a group of institutions within the study scope and with available financed emissions data. Currently, only 19% of institutions in the 2023 sample are covered by the NZFT's analyses [NZFT, 2024].

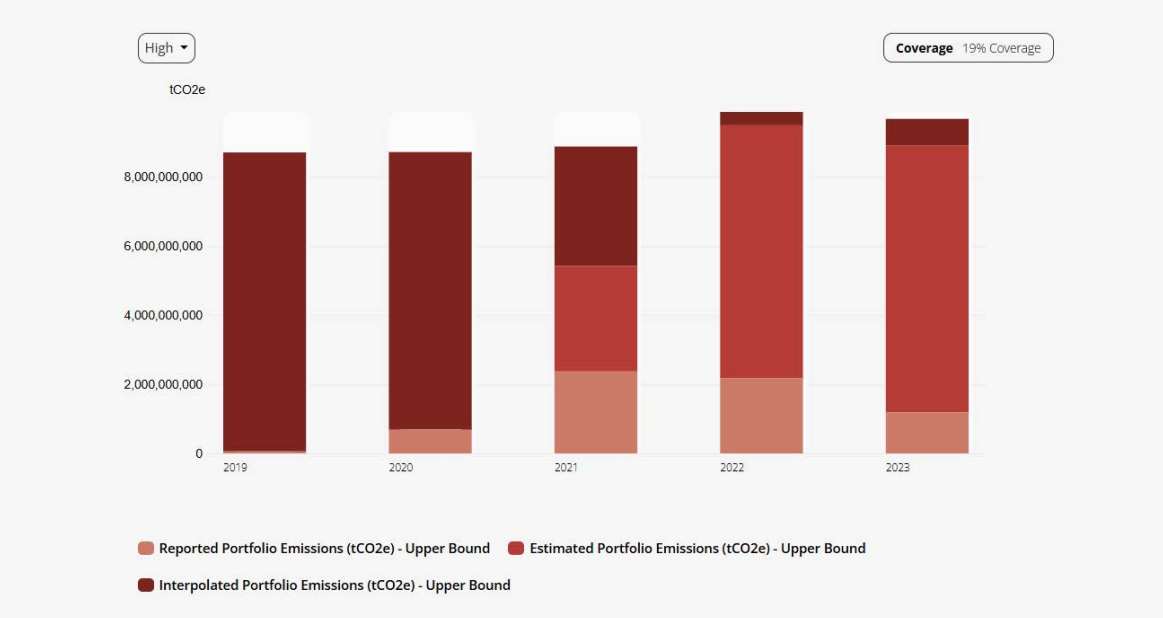
To acquire emissions data, the NZFT uses three main approaches:

- Reported emissions – emissions data provided directly by financial institutions.
- Interpolated emissions – recent emissions data used to fill in gaps for years with missing data.
- Estimated emissions – emissions calculated based on ownership stakes, utilizing either the equity ownership consolidation methodology or MSCI's methodology.

Using these three types of data sources, the NZFT consolidates emissions estimates while retaining the segmentation between reported, interpolated, and estimated data within the total emissions figure of the financial institutions' group. To account for data variability, the NZFT presents both lower and upper boundary values for aggregated emissions. These design choices aim to ensure robustness and transparency in the results.

However, as noted by CPI, the aggregation methodology is still under development. A key challenge that could be identified is that, while the equity ownership consolidation method helps reduce the risk of double counting within the estimated data, this risk persists when aggregating the three different types of emissions data.

Figure 22 - Aggregated portfolio emissions (maximum values), from NZFT [2024]



5.4. Pros, cons and areas for further research

In theory, *FI Emissions alignment approaches* are well-aligned with the core objective of climate-related financial efforts—reducing greenhouse gas emissions. A benefit of this type of approach is its direct focus on tracking the emissions linked to financial services, allowing for a comprehensive view of their decarbonization progress.

As mentioned, the authors believe this approach is best applied to ex-post emissions (rather than projected emissions), either to unattributed emissions' metrics or coupled with attribution analysis to determine whether proportion of emissions' change can effectively be linked to real-world decarbonization.

Yet, in practice and as discussed in this section, several challenges arise in implementing this approach robustly.

Data coverage issues persist, as many financial institutions lack comprehensive emissions data for their entire portfolio, especially for less-reported asset classes such as private equity or sovereign debt. This requires the use of proxies or estimations, which can introduce inaccuracies.

Emissions projections, while forward-looking, are inherently uncertain, particularly over long-time horizons. These projections depend heavily on the credibility of targets set by financial institutions and on data availability for Scope 3 and other hard-to-measure emissions categories.

There is no universal consensus on whether and how to aggregate emissions data across different asset classes, activities, or financial institutions, especially given the diversity in reporting methodologies (e.g., absolute vs. intensity metrics). This lack of harmonisation makes cross-institutional comparisons difficult and complicates the consolidation of data at the portfolio level and beyond

Double-counting of emissions across financial services (e.g., lending and investing in the same entity) and across institutions (e.g., Asset Owners and Asset Managers) remains a significant risk when consolidating emissions that can distort alignment assessments if not carefully addressed.

Therefore, an area for further research is how to develop standardised methodologies for the assessment of the alignment of the consolidated emissions across a group of financial institutions that address data gaps and double-counting. This report already suggests a way forward based using unattributed emissions and accepting double counting. Further exploration into harmonising methodologies, improving Scope 3 emissions reporting. Additionally, integrating emissions aggregation with other approaches, such as *FI Transition alignment* and *Financing Alignment approaches*, could provide a more holistic understanding of financial institutions' progress toward global climate goals.

Finally, there is a need to investigate whether a decrease in consolidated emissions (and potentially the resulting alignment) can be linked to financial institutions' actions – or whether it is just "paper 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].

Ex-post attribution analysis is key. 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 suggests 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 financial assets have decarbonized through real or virtual changes [2° Investing Initiative, 2022].

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".

Yet these approaches are only emerging at portfolio-level and are far from applicable to the macro-level at the current level of research.

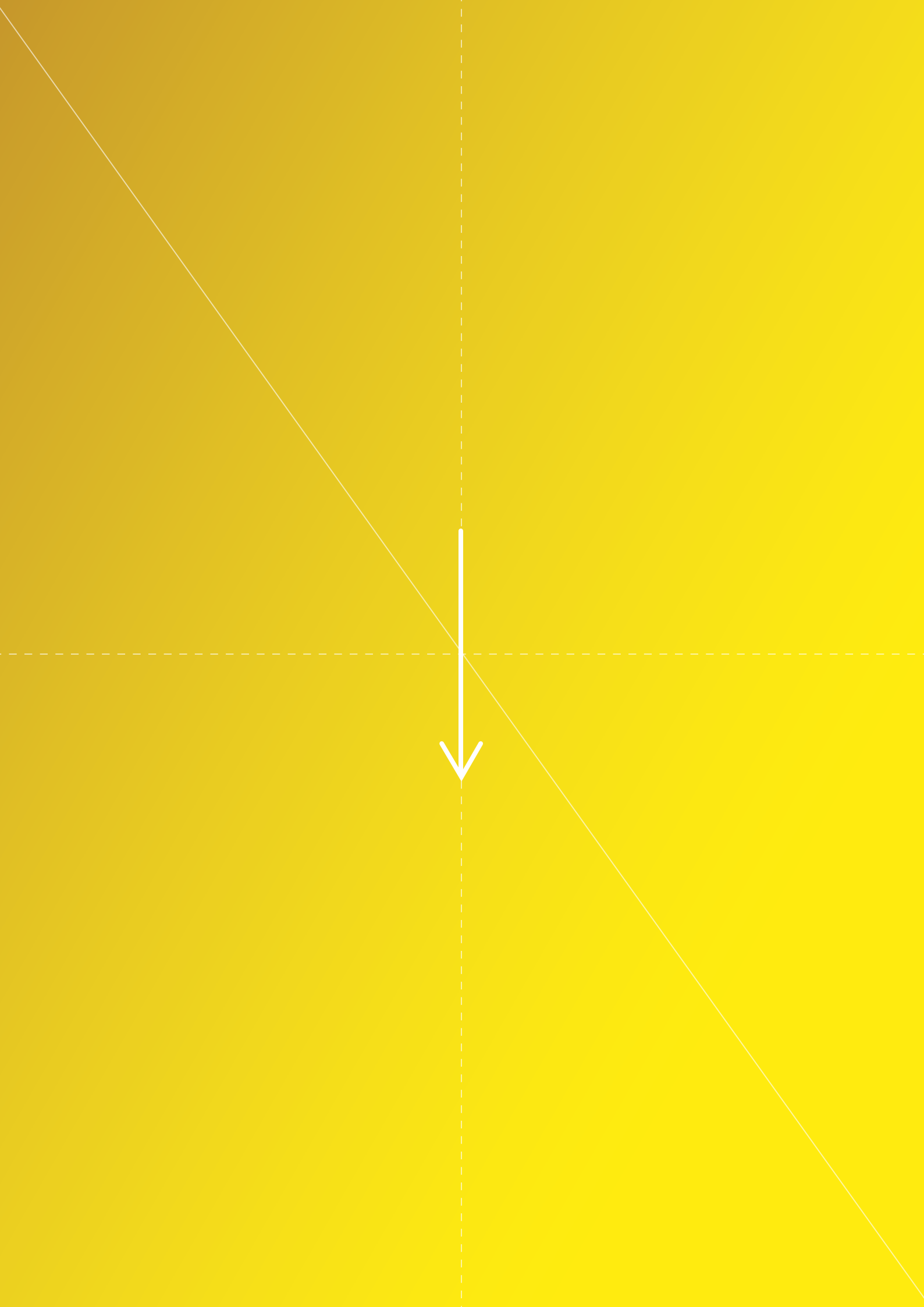
Therefore, there are several areas where further research is needed to strengthen *FI Emissions alignment approaches* to assess the consolidated alignment of a group of financial institutions:

1. Harmonizing emissions targets for better consolidation across multiple financial institution levels and timeframes. Consistent methodologies for different asset classes and timelines would improve alignment and comparability.

2. Developing approaches for projecting emissions in cases where data is lacking, especially for institutions without specific emissions targets, including proxies for filling data gaps.

3. Refining methods for aggregating projected emissions at consolidated levels, addressing both double-counting risks and the influence of varying levels of impact across asset classes and activities.

4. Developing ex-post attribution analysis to evaluate whether year-on-year changes can be attributed to real-world decarbonization.



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Acronyms

2DII	2° Investing Initiative
ACA	Absolute Contraction Approach
ACT	Accelerate Climate Transition
ACT Finance	Accelerate Climate Transition Finance
ADEME	Agence de l'Environnement et de la Maîtrise de l'Energie
AM	Asset Management
AO	Asset Owner
AuM	Assets under Management
BNEF	Bloomberg New Energy Finance
CAPA	Consolidated Alignment Performance Analytics
CAPEX	Capital Expenditure
CBI	Climate Bonds Initiative
CDP	Carbon Disclosure Project
CIA	Carbon Impact Analytics
CPI	Climate Policy Initiative
CSDDD	Corporate Sustainability Due Diligence Directive
CSRD	Corporate Sustainability Reporting Directive
EBA	European Banking Authority
EEIO	Environmentally Extended Input-Output
EPC Label	Energy Performance Certificate Label
EU	European Union
EUR	Euro
EVIC	Enterprise Value Including Cash
FI	Financial Institution
GDP	Gross Domestic Product
GFA	Green Finance Alliance
GFANZ	Glasgow Financial Alliance for Net Zero
GHG	Greenhouse Gas
GST	Global Stocktake
I4CE	Institute for Climate Economics
IEA	International Energy Agency
IIGCC	Institutional Investors Group on Climate Change
ILB	Institut Louis Bachelier
IM	Investment Manager
IPCC	Intergovernmental Panel on Climate Change
I-PEPS	Indicators for Portfolio-weighted Emissions Performances
KPI	Key Performance Indicator
MiFID II	Markets in Financial Instruments Directive II
NDC	Nationally Determined Contributions
NGFS	Network for Greening the Financial System
NZAD	Net Zero Alignment Dataset
NZAM	Net Zero Asset Managers
NZAOA	Net Zero Asset Owners Alliance
NZBA	Net Zero Banking Alliance
NZBAF	Net Zero Banking Assessment Framework
NZE	Net Zero Emissions
NZFT	Net Zero Finance Tracker
OECD	Organization for Economic Co-operation and Development
OPEX	Operational Expenditure
PAB	Paris-Aligned Benchmark
PACTA	Paris Agreement Capital Transition Assessment
PACTA COP	Paris Agreement Capital Transition Assessment COP
PAII	Paris Aligned Investment Initiative
PAT	Portfolio Alignment Team
PCAF	Partnership for Carbon Accounting Financials
PSF	EU Platform on Sustainable Finance
SBT	Science-Based Target
SBTi	Science-Based Targets initiative
SBTi FINZ	SBTi Financial Institutions Net Zero
SCF	Standing Committee on Finance
SDA	Sectoral Decarbonization Approach
SFDR	Sustainable Finance Disclosure Regulation
SFO	Sustainable Finance Observatory
SLB	Sustainability-Linked Bond
SME	Small and Medium-sized Enterprises
TCFD	Task Force on Climate-related Financial Disclosures
tCO2e	Tonnes of Carbon Dioxide Equivalent
TPI	Transition Pathway Initiative
TSP	Target Setting Protocol
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
US$	United States Dollar
WACI	Weighted Average Carbon Intensity
WEO	World Energy Outlook
WWF	World Wide Fund for Nature

Glossary

Activity

Specific financial asset or economic activity with a clear use of proceeds linked to the financial instrument. An activity-level metric, meanwhile, captures primarily the (emissions) performance of an activity such as its physical intensity, and enables the comparison across other market actors; an example would be the Annual Efficiency Ratio (AER) of a ship within the shipping sector. [SBTi, 2024]

Asset class

An asset class is a grouping of financial instruments that have similar financial characteristics (e.g. listed equity, corporate loans). Metrics can be generated at the asset class level that measure attributes of all underlying entities/ activities within the asset class. [SBTi, 2024]

Counterparty

Parties that are a part of a financial transaction, e.g. clients of a bank or insurance company, or the portfolio companies of investors. Counterparties are further split at the entity and activity level: [SBTi, 2024]

Entity

A legal entity typically receiving financial services through a general use of proceeds financial instrument. An entity-level metric seeks to capture the performance of the entity, and therefore may be based on the historical GHG emissions, the forward-looking ambition, or the relative “greenness” of its activities. [SBTi, 2024]

Portfolio

A portfolio is a collection of financial investments like stocks, bonds, commodities, cash, and cash equivalents, as well as their fund counterparties (entities and activities). For the purposes of this paper, the portfolio can extend across multiple asset classes, including loans and investments. Metrics at the portfolio level measure the aggregate performance of all underlying entities/ activities across a range of financial asset classes and services. [SBTi, 2024]

Sector

Within an asset class, a sector is a grouping of entities or activities that exhibit similar characteristics such as the product or service they produce. Metrics can be generated at the sector level that measure attributes of all underlying entities within the sector based on common characteristics. [SBTi, 2024]

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].

Bibliography

- 2° Investing Initiative. (2017). Finance sector alignment with international climate goals: Reviewing options and obstacles | https://theiafinance.org/wp-content/uploads/2017/02/Finance-sector-alignment-with-international-climate-goals-GreenWin-2017.pdf
- 2° Investing Initiative. (2020). Bridging the gap: Measuring progress on the climate goal alignment and climate actions of swiss financial institutions | https://sustainablefinanceobservatory.org/wp-content/uploads/2020/11/Bridging-the-Gap.pdf
- 2° Investing Initiative. (2021a). PACTA Climate Alignment Assessment of the Austrian Financial Sector - 2DII. 2DII - Aligning Financial Markets With the Paris Agreement Goals | https://sustainablefinanceobservatory.org/resource/pacta-cop-austria/
- 2° Investing Initiative. (2021b). Taking the Plunge: A Stocktake of National Financial Sector Climate Alignment Assessments | https://sustainablefinanceobservatory.org/wp-content/uploads/2021/11/PACTA-COP-Stocktake.pdf
- 2° Investing Initiative. (2024, October). Collective investor impact in secondary markets - 2DII. 2DII - Aligning Financial Markets With the Paris Agreement Goals | https://sustainablefinanceobservatory.org/resource/collective-investor-impact-in-secondary-markets/
- 6:1, un ratio pour transformer notre système énergétique. (2024, February 6). Reclaim Finance | https://reclaimfinance.org/site/2024/02/06/61-un-ratio-pour-transformer-notre-systeme-energetique/
- Act. (2024, October 31). ACT Finance, la méthodologie pour le secteur financier. ACT Initiative | https://actinitiative.org/act-finance-la-methodologie-pour-le-secteur-financier/
- ACT Finance. (2024a). Banking Methodology: Version 2.2. | https://actinitiative.org/wp-content/uploads/pdf/act_finance_banking_methodology_20240222.pdf
- ACT Finance. (2024a). ACT Assessment Categorization: Version 0.1. | https://actinitiative.org/wp-content/uploads/documents/act_assessment_categorization_framework_paper_v0.1.pdf
- ACT Finance. (2024b). Investing Methodology: Version 2.2. | https://actinitiative.org/wp-content/uploads/pdf/act_finance_investing_methodology_20240222.pdf
- ACT Initiative. (2025, January 17). Accueil - ACT Initiative. | https://actinitiative.org/
- Ambitious corporate climate action. (n.d.). Science Based Targets Initiative | https://sciencebasedtargets.org/
- Banking Tool - Transition Pathway Initiative. (n.d.) | https://www.transitionpathwayinitiative.org/banks
- BloombergNEF. (2022). Investment Requirements of a Low-Carbon World: Energy Supply Investment Ratios | https://assets.bbhub.io/professional/sites/24/BNEF-EIRP-Climate-Scenarios-and-Energy-Investment-Ratios.pdf

- BloombergNEF. (2024). Energy Supply Banking Ratios: Implementation Guide | https://assets.bbhub.io/professional/sites/24/Energy-Supply-Banking-Ratios-Implementation-Guide.pdf
- Bouchet, V. & Institut Louis Bachelier. (2024). Implied temperature rise of Equity Portfolios: A sensitivity Analysis framework | https://www.institutlouisbachelier.org/wp-content/uploads/2024/05/implied-temperature-rise-of-equity-portfolios-0905.pdf
- Bouchet, V. & Scientific Portfolio an EDHEC Venture. (2024). Attribution analysis of greenhouse gas emissions associated with an equity portfolio: A comparison of existing frameworks | https://scientificportfolio.com/pdfs/2024-11-attribution-analysis-of-ghg-emissions-associated-with-an-equity-portfolio.pdf
- Caldecott, B., Thomae, J., Mitchell, J., & Scott, M. (2022) How can net zero finance best drive positive impact in the real economy. Discussion Paper. Finance Sector Expert Group for Race to Zero and Race to Resilience, UN High-Level Champions for Climate Action | https://climatechampions.unfccc.int/wp-content/uploads/2022/05/FSEG-report-2_v3.pdf
- CDP. (2023). Are companies developing credible climate Transition Plans?: Disclosure to key climate transition-focused indicators in CDP's 2022 Climate Change Questionnaire | https://cdn.cdp.net/cdp-production/cms/reports/documents/000/006/785/original/Climate_transition_plan_report_2022_%2810%29.pdf?1676456406
- CDP & WWF. (2020). Temperature Rating Methodology: A temperature rating method for targets, corporates, and portfolios | https://cdn.cdp.net/cdp-production/comfy/cms/files/files/000/003/741/original/Temperature_scoring_-_beta_methodology.pdf
- Climate Bonds Initiative. (2021). Financing credible transitions: How to ensure the transition label has impact | https://www.climatebonds.net/files/reports/cbi_fincredtransitions_final.pdf
- Climate Bonds Initiative. (2022). Transition finance for transforming companies: Tools to assess companies' transitions and their SLBs | https://www.climatebonds.net/files/files/Transition-Finance-for-Transforming-Companies-6092022%281%29.pdf
- Climate Policy Initiative. (n.d.). Climate Policy Initiative - expertise in climate finance and policy analysis. CPI | https://www.climatepolicyinitiative.org/
- Climate Policy Initiative. (2020). Paris misaligned? - CPI. In CPI | https://www.climatepolicyinitiative.org/publication/paris-misaligned/
- Climate Policy Initiative. (2023). Global Landscape of Climate Finance 2023 | https://www.climatepolicyinitiative.org/wp-content/uploads/2023/11/Global-Landscape-of-Climate-Finance-2023.pdf
- Climate Policy Initiative. (2024a). Net Zero Finance Tracker Methodology 3.0. | https://www.climatepolicyinitiative.org/wp-content/uploads/2024/10/NZFT-2024_Methodology.pdf
- Climate Policy Initiative. (2024b). Climate Finance Roadmaps | https://www.climatepolicyinitiative.org/publication/climate-finance-roadmaps/
- Corporate sustainability due diligence. (n.d.). European Commission | https://commission.europa.eu/business-economy-euro/doing-business-eu/sustainability-due-diligence-responsible-business/corporate-sustainability-due-diligence_en
- CPI Net Zero Finance Tracker - Takeaways. (n.d.) | https://netzerofinancetracker.climatepolicyinitiative.org/
- Directive - 2022/2464 - EN - CSRD Directive - EUR-LEX. (n.d.) | https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022L2464
- EUR-LEX - 32023H1425 - EN - EUR-LEX. (n.d.) | https://eur-lex.europa.eu/legal-content/FR/TXT/?uri=CELEX:32023H1425
- EUR-LEX - 52023PC0314 - EN - EUR-LEX. (n.d.) | https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023PC0314
- European Commission. (2023). Commission recommendation (EU) 2023/1425 of 27 June 2023 on facilitating finance for the transition to a sustainable economy | https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023H1425
- European Securities and Markets Authority (ESMA). (2022). Guidelines on certain aspects of the MiFID II suitability requirements | https://www.esma.europa.eu/sites/default/files/library/esma35-43-3172_final_report_on_mifid_ii_guidelines_on_suitability.pdf
- GFANZ. (2022a). Measuring Portfolio Alignment: Driving enhancement, convergence, and adoption. | https://assets.bbhub.io/company/sites/63/2022/09/Measuring-Portfolio-Alignment-Enhancement-Convergence-and-Adoption-November-2022.pdf
- GFANZ. (2022b). Financial Institution Net-Zero Transition Plans: Fundamentals, Recommandations, and Guidance | https://assets.bbhub.io/company/sites/63/2022/09/Recommendations-and-Guidance-on-Financial-Institution-Net-zero-Transition-Plans-November-2022.pdf
- GFANZ. (2023a). 2023 Progress Report | https://assets.bbhub.io/company/sites/63/2023/11/GFANZ-2023-Progress-Report.pdf
- GFANZ. (2023b). Scaling Transition Finance and Real-economy Decarbonisation | https://assets.bbhub.io/company/sites/63/2023/11/Transition-Finance-and-Real-Economy-Decarbonization-December-2023.pdf
- GFANZ. (2024). 2024 Progress Report | https://assets.bbhub.io/company/sites/63/2024/11/GFANZ-Progress-Report-2024.pdf
- Granoff, I., Lee, T., & Columbia Law School. (2024). Shocking financed emissions: the effect of economic volatility on the portfolio footprinting of financial institutions | https://scholarship.law.columbia.edu/cgi/viewcontent.cgi?article=1223&context=sabin_climate_change
- Green, Daniel and Vallee, Boris, Measurement and Effects of Bank Exit Policies (January 13, 2024). Available at SSRN: https://ssrn.com/abstract=4090974 or http://dx.doi.org/10.2139/ssrn.4090974
- Green Finance Alliance. (2024a). I-PEPs: Consultation | https://www.bmk.gv.at/en/green-finance/alliance/consultation.html

- Green Finance Alliance. (2024b). I-PEPs: Proposal for a new KPI set to steer the decarbonisation of financial companies: (Draft for public consultation). | https://www.bing.com/ck/a?!&&p=e9ca66c6af53eedf6f27beea32178a0419f47ed2704ac921c852af8c7b7274c3JmltdHM9MTczNjcyNjQwMA&ptn=3&ver=2&hsh=4&fclid=16864deb-d6cd-60f2-3048-58c6d73261f2&psq=ipeps+presentation+green+finance+alliance&u=a1aHR0cHM6Ly93d3cuYm1rLmd2LmF0L2RhbS9qY3I6Y2UwMTQ1OTktZTBiOS00OTFmLWJkYWMtOGYyOGZhYjc4MDg5L0ktUEVQc19wcmVzZW50YXRpb25fRU4ucGRm&ntb=1

- Hainaut, H., & Cochran, I. (2018). The Landscape of domestic climate investment and finance flows: Methodological lessons from five years of application in France. International Economics, 155, 69–83 | https://doi.org/10.1016/j.inteco.2018.06.002

- Hilke, A., Hubert, R., Pauthier, A., Raynaud, J. 2021. Taking climate-related disclosure to the next level – Minimum requirements for financial institutions. I4CE - Institute for Climate Economics and Institut Louis Bachelier | https://www.i4ce.org/wp-content/uploads/I4CE-ILB_2021_Taking-climate-related-disclosure-to-the-next-level.pdf

- Home - Transition Pathway initiative. (n.d.) | https://www.transitionpathwayinitiative.org/

- IIGCC. (2022). From concept to capital flows: The investor perspective on transition finance | https://www.iigcc.org/hubfs/2024%20resources%20uploads/IIGCC%20From%20concept%20to%20capital%20flows%20-%20the%20investor%20perspective%20on%20transition%20finance%202024.pdf

- IIGCC. (2024a). Improving net zero data provision: Six asks of data vendors. | https://139838633.fs1.hubspotusercontent-eu1.net/hubfs/139838633/Past%20resource%20uploads/IIGCC-Six-Asks-of-Data-Vendor-Final.pdf

- IIGCC. (2024b). Net Zero Investment Framework updated: NZIF 2.0. | https://www.iigcc.org/resources/updated-net-zero-investment-framework-nzif-2.0

- IIGCC & Vivid Economics. (2022). Climate Investment Roadmap | https://www.iigcc.org/resources/climate-investment-roadmap

- Impact - CPI Net Zero Finance Tracker. (n.d.) | https://netzerofinancetracker.climatepolicyinitiative.org/impact/?aggregator=Number%20of%20Institutions&coalition=All&country=All&countryList=All&search=&sector=All&subsector=All

- InfluenceMap. (n.d.). Methodology. (C) InfluenceMap 2021 | https://financemap.org/our-methodology

- InfluenceMap. (2025, January 1). Home. (C) InfluenceMap 2021 | https://influencemap.org/

- Initiative Climat International & Sustainable Markets Initiative Private Equity Task Force. (2023). Private Markets Decarbonisation Roadmap | https://www.bain.com/contentassets/6df8cbe0d2a34117bf9751b150a6372e/private-markets-decarbonisation-roadmap.pdf

- Institut Louis Bachelier et al. (2020). The Alignment Cookbook - A Technical Review of Methodologies Assessing a Portfolio's Alignment with Low-carbon Trajectories or Temperature Goal | https://www.institutlouisbachelier.org/wp-content/uploads/2021/03/the-alignment-cookbook-a-technical-review-of-methodologies-assessing-a-portfolios-alignment-with-low-carbon-trajectories-or-temperature-goal.pdf

- Institut Louis Bachelier et al. (2024). 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 | https://www.institutlouisbachelier.org/wp-content/uploads/2024/05/cookbook-0905.pdf

- International Energy Agency. (2023). The Oil and Gas Industry in Net Zero Transitions | https://iea.blob.core.windows.net/assets/f065ae5e-94ed-4fcb-8f17-8ceffde8bdd2/TheOilandGasIndustryinNetZeroTransitions.pdf

- Investor Action Plans (ICAPS). (2023). Expectations ladder | https://theinvestoragenda.org/wp-content/uploads/2021/05/expectations-ladder.pdf

- Jahn V, Brochard A, Diaz N, Hajagos-Tóth Á and Dietz S (2024) State of transition in the banking sector. London: Transition Pathway Initiative Centre, London School of Economics and Political Science | https://www.transitionpathwayinitiative.org/publications/uploads/2024-state-of-transition-in-the-banking-sector-report-2024.pdf

- Kania, J., & Kramer, M. (2011). Collective Impact. Stanford Social Innovation Review | https://ssir.org/images/articles/2011_WI_Feature_Kania.pdf

- Kölbel, J. F., Heeb, F., Paetzold, F., & Busch, T. (2020). Can sustainable investing save the world? Reviewing the mechanisms of investor impact. Organization & Environment, 33(4), 554–574 | https://doi.org/10.1177/1086026620919202

- McKinsey & Company. (2022). The net-zero transition: What it would cost, what it could bring | https://www.mckinsey.com/~/media/mckinsey/business%20functions/sustainability/our%20insights/the%20net%20zero%20transition%20what%20it%20would%20cost%20what%20it%20could%20bring/the-net-zero-transition-what-it-would-cost-and-what-it-could-bring-final.pdf

- McKinsey & Company. (2023). Financing the net-zero transition: From planning to practice. In McKinsey & Company | https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/financing-the-net-zero-transition-from-planning-to-practice

- Monetary Authority of Singapore. (2023). Taxonomy | https://www.mas.gov.sg/development/sustainable-finance/taxonomy

- MSCI. (2023). A Framework for Attributing Changes in Portfolio Carbon Footprint | https://www.msci.com/documents/10199/f918c071-1ae7-187d-40ae-a644f89e0027

- Net-Zero Alignment Dataset. (n.d.). CDP | https://www.cdp.net/en/data-licenses/net-zero-alignment-dataset

- Net-Zero Banking Alliance. (n.d.) | https://www.unepfi.org/net-zero-banking/
- NZAOA. (2023). Understanding the drivers of investment portfolio decarbonisation | https://www.unepfi.org/industries/understanding-the-drivers-of-investment-portfolio-decarbonisation/
- NZIF 2.0: Implementation Guidance for Objective and Targets: Section 5 - Asset level targets: Alignment and Engagement Across all asset classes. (2024) | https://www.iigcc.org/hubfs/TSG%20section%205%20A%26E%20Across%20all%20asset%20classes.pdf
- OECD. (2019). Tracking finance flows towards assessing their consistency with climate ojbectives | https://www.oecd.org/en/publications/tracking-finance-flows-towards-assessing-their-consistency-with-climate-objectives_82cc3a4c-en.html
- OECD. (2020a). Exploring options to measure the climate consistency of real economy investments: The manufacturing industries of Norway | https://www.oecd.org/en/publications/exploring-options-to-measure-the-climate-consistency-of-real-economy-investments_1012bd81-en.html
- OECD. (2020b). Exploring options to measure the climate consistency of real economy investments: The transport sector in Latvia | https://www.oecd.org/en/publications/exploring-options-to-measure-the-climate-consistency-of-real-economy-investments_48d53aac-en.html
- OECD. (2021). Measuring the alignment of real economy investments with climate mitigation objectives: The United Kingdom's buildings secto | https://www.oecd.org/en/publications/measuring-the-alignment-of-real-economy-investments-with-climate-mitigation-objectives_8eccb72a-en.html
- OECD (2024), OECD Review on Aligning Finance with Climate Goals: Assessing Progress to Net Zero and Preventing Greenwashing, Green Finance and Investment, OECD Publishing, Paris | https://doi.org/10.1787/b9b7ce49-en
- PACTA COP - PACTA. (n.d.). PACTA | https://pacta.rmi.org/pacta-cop/
- Paris Aligned Asset Owners – Investing for a net zero future. (n.d.) | https://www.parisalignedassetowners.org/
- Paris Aligned Investment Initiative (PAII). (2021). Implementation Guide: Version 1.0. | https://www.parisalignedassetowners.org/media/2021/03/PAII-Net-Zero-Investment-Framework_Implementation-Guide.pdf
- PCAF. (2023). Facilitated Emissions | https://carbonaccountingfinancials.com/files/PCAF-PartB-Facilitated-Emissions-Standard-Dec2023.pdf
- Platform on Sustainable Finance. (2023). Climate Change Taxonomy and the EU Regulatory Response: EU Taxonomy-Aligning Benchmarks (TABs) Report | https://finance.ec.europa.eu/system/files/2023-12/231213-sustainable-finance-platform-draft-report-eu-taxonomy-aligning-benchmarks_en.pdf
- Platform on Sustainable Finance. (2024). Monitoring Capital Flows to Sustainable Investments: Intermediate report | https://finance.ec.europa.eu/document/download/5dfafa22-ebdf-43d8-88bb-f48c44ecd28e_en?filename=240404-sf-platform-report-monitoring-capital-flows_en.pdf
- Platform on Sustainable Finance report on a compendium of market practices. (n.d.). Finance | http://finance.ec.europa.eu/publications/platform-sustainable-finance-report-compendium-market-practices_en
- Portfolio Alignment Team. (2020) | Measuring Portfolio Alignment: Technical Considerations | https://www.tcfdhub.org/wp-content/uploads/2021/10/PAT_Measuring_Portfolio_Alignment_Technical_Considerations.pdf
- Reclaim Finance. (n.d.-a). Coal Policy Tracker | https://coalpolicytool.org/
- Reclaim Finance. (n.d.-b). Oil Gas Policy Tracker | https://oilgaspolicytracker.org/
- Reclaim Finance. (n.d.-c). Sustainable Power Policy Tracker | https://sustainabilitypolicytracker.org/
- Reclaim Finance. (2024a). Banking on climate chaos report: Fossil fuel finance report 2024. In Reclaim Finance | https://reclaimfinance.org/site/en/2024/05/16/banking-on-climate-chaos-report-2024/
- Reclaim Finance. (2024). Targeting Net Zero: The need to redesign bank decarbonisation targets | https://reclaimfinance.org/site/wp-content/uploads/2024/09/Targeting-Net-Zero-Report.pdf
- Reclaim Finance. (2024c). Financial institutions' transition plans: How to drive real-economy decarbonization | https://reclaimfinance.org/site/wp-content/uploads/2024/12/Financial-institutions-transition-plans-how-to-drive-real-economy-decarbonization-report.pdf
- Regulation - 2019/2088 - EN - sfdr - EUR-Lex. (n.d.) | https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019R2088
- Regulation - EU - 2023/2631 - EN - EUR-LEX. (n.d.) | https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32023R2631
- Science Based Targets Initiative. (2024). Financial Institutions Net-Zero Standard: Consultation Draft V0.1. | https://sciencebasedtargets.org/resources/files/FINZ-Consultation-Draft.pdf
- ShareAction. (2023). Green Ambitions, Grey Realities: European Bank's journey from pledges to practice | https://cdn2.assets-servd.host/shareaction-api/production/resources/reports/Green-Ambitions-Grey-Realities.pdf
- Sustainable Finance Observatory. (n.d.) | https://observatoire-delafinancedurable.com/en/net-zero-donut

- Sustainable Markets Initiative Asset Manager and Asset Owner Task Force. (2023). Transition Categorisation Framework | https://a.storyblok.com/f/109506/x/6675975ef4/smi-transition-categorisation-framework.pdf
- Targets - CPI Net Zero Finance Tracker. (n.d.) | https://netzerofinancetracker.climatepolicyinitiative.org/targets/?aggregator=Number%20of%20Institutions&coalition=All&country=All&countryList=All&search=&sector=All&subsector=All
- The International Transition Plan Network. (2025, January 23). TPT legacy | International Transition Plan Network. ITPN | https://itpn.global/tpt-legacy/
- Theia Finance Labs. (2024). We were wrong: A reassessment of the viability of financed emissions accounting and target-setting | https://theiafinance.org/wp-content/uploads/2024/07/Theia_Wewerewrong_v0.pdf
- Transition Pathway Initiative. (2024). State of transition in the banking sector | https://www.transitionpathwayinitiative.org/publications/uploads/2024-state-of-transition-in-the-banking-sector-report-2024.pdf
- Transition Plan Taskforce. (2023). Disclosure Framework | https://www.ifrs.org/content/dam/ifrs/knowledge-hub/resources/tpt/disclosure-framework-oct-2023.pdf
- UN-convened Net-Zero Asset Owner Alliance. (n.d.) | https://www.unepfi.org/net-zero-alliance/
- UNEP. (2023). Developing Metrics for Transition Finance: Discussion Paper | https://www.unepfi.org/wordpress/wp-content/uploads/2023/12/Developing-Metrics-for-Transition-Finance.pdf
- UNFCCC. (2023). Views on the elements for the consideration of outputs component of the first global stocktake: 2023 Synthesis report on GST elements | https://unfccc.int/sites/default/files/resource/SYR_Views%20on%20%20Elements%20for%20CoO.pdf
- UNFCCC. Standing Committee on Finance (SCF). (2022a). Fifth Biennial Assessment and Overview of Climate Finance Flows Technical Report | https://unfccc.int/documents/619173
- UNFCCC. Standing Committee on Finance (SCF). (2022b). Report of the Standing Committee on Finance: Mapping of available information relevant to Article 2, paragraph 1(c), of the Paris Agreement, including its reference to Article 9 thereof | https://unfccc.int/documents?f%5B0%5D=symboldoc%3AFCCC/CP/2022/8/Add.4-FCCC/PA/CMA/2022/7/Add.4
- United Nations Environment Programme (2023). Net-Zero Asset Owner Alliance: Demonstrating 1.5°C-Aligned Decarbonisation. Geneva | https://www.unepfi.org/wordpress/wp-content/uploads/2024/10/NZAOA-Fourth-Progress-Report_FINAL.pdf
- United Nations Environment Programme (2023). Net-Zero Banking Alliance 2023 Progress Update. Geneva | https://www.unepfi.org/wordpress/wp-content/uploads/2023/11/NZBA-Progress-Update-2023.pdf
- United Nations Environment Programme (2023). The Third Progress Report of the Net-Zero Asset Owner Alliance: Increasing Climate Ambition, Decreasing Emissions. Geneva | https://www.unepfi.org/wordpress/wp-content/uploads/2023/10/NZAOA-Third-Progress-Report.pdf
- United Nations Environment Programme (2024). Net-Zero Banking Alliance 2024 Progress Report. Geneva | https://www.unepfi.org/wordpress/wp-content/uploads/2024/10/NZBA-2024-Progress-Report.pdf#:~:text=NZBA%20The%20Net-Zero%20Banking%20Alliance%20(NZBA)%20is%20a%20bank-led,%20UN-convened
- United Nations Environment Programme (2024). Net-Zero Asset Owner Alliance: Demonstrating 1.5°C-Aligned Decarbonisation. Geneva | https://www.unepfi.org/wordpress/wp-content/uploads/2024/10/NZAOA-Fourth-Progress-Report_FINAL.pdf
- U.S. Department of the Treasury. (2023). Principles for Net-Zero Financing & Investment | https://home.treasury.gov/system/files/136/NetZeroPrinciples.pdf
- World Benchmarking Alliance. (2024, November 14). Assessing Transition Plans Collective (ATP-COL) - World Benchmarking Alliance | https://www.worldbenchmarkingalliance.org/news/assessing-companies-transition-plans-collective-atp-col/
- World Resources Institute. (n.d.). Financial Institutions Net Zero Tracker: Implementation | https://www.wri.org/financial-institutions-net-zero-tracker/implementation