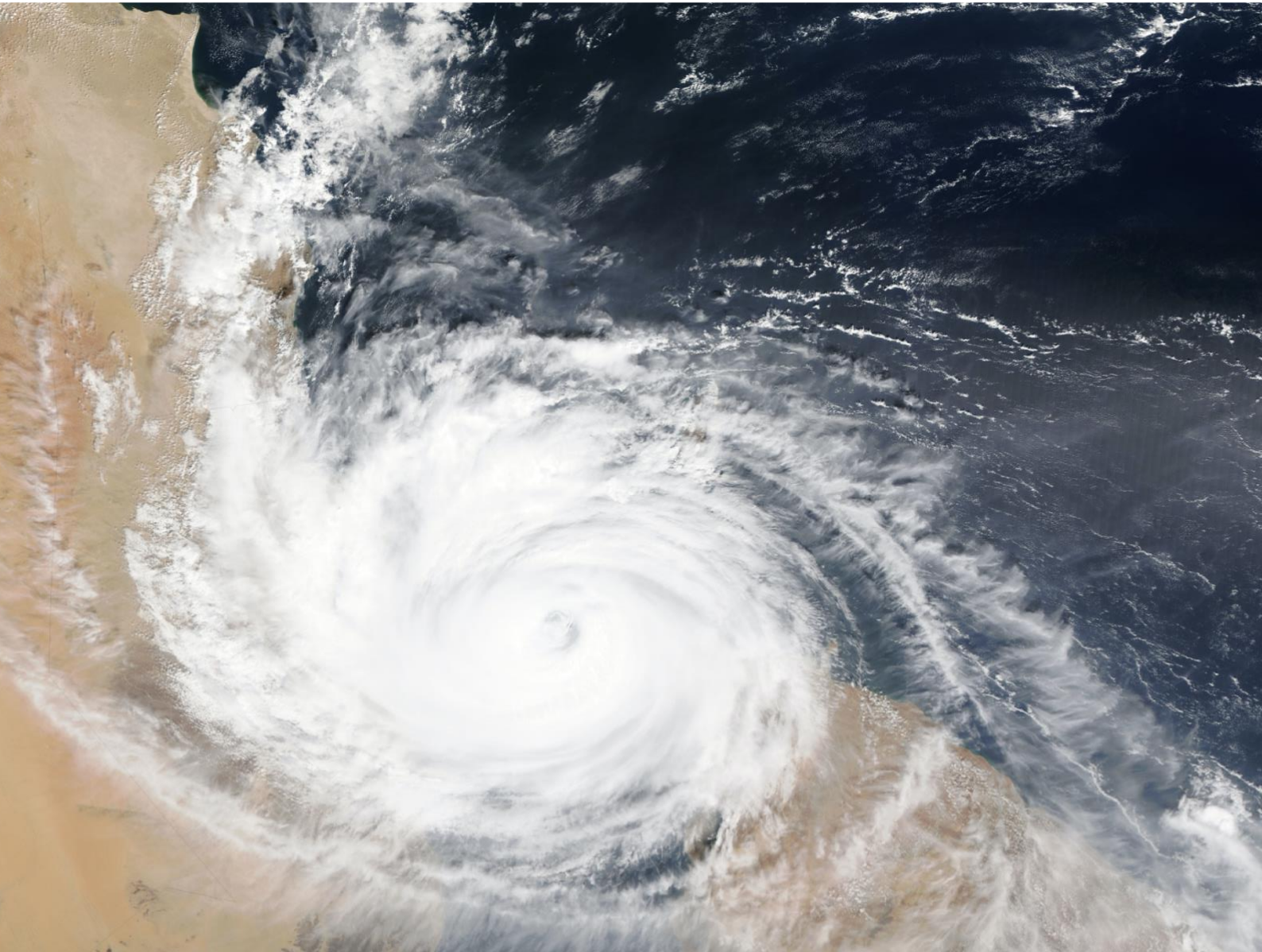


LSFI Climate Measurement and Reporting Working Group

Outcome Report

October 2023



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Introduction

This document provides an overview of the work conducted by the LSFI Working Group on Climate Measurement and Reporting in 2023, which aimed to identify climate-related tools that the Luxembourg financial sector could use to support its journey to net zero.

Through their work, the working group assessed key tools and methodologies to be used by financial institutions in their transition to net zero, examining their use, functionalities, and alignment with the current regulatory requirements.

The work conducted does not intend to serve as financial or strategic advice, nor it aims to be fully comprehensive. The overall goal is to bring clarity to the decarbonisation path financial institutions should follow. It is acknowledged that gaps or further dimensions might be analysed at another stage.

Likewise, the suggestions included in this document are generic and thus might not be equally applicable or relevant for all the financial institutions within the scope. Moreover, the analysis and the recommendations refer to the selected scope only as defined in the subsequent sections. Whether to follow or use any of the analysed methodologies or tools is up to the financial institutions, each of which might have different particularities and needs.

The Luxembourg Sustainable Finance Initiative (LSFI) sincerely thanks the working group members for their commitment, outstanding effort, and intensive work. Your experience and analysis have been extremely valuable and constitute a significant step to help the Luxembourg financial sector advance towards sustainable finance.

1. About the working group

1.1. Context

The transition towards sustainability is paramount for our society, economy, and planet. It's a broad journey where a key component is preventing, mitigating and adapting to climate change.

Over the last few years, climate change has been widespread and intensifying. In 2021, the Intergovernmental Panel on Climate Change (IPCC) stated in its 6th Assessment Report that this phenomenon is undoubtedly linked to human action. The IPCC 6th Synthesis Report 2023¹ clearly says that “Limiting human-caused global warming requires net-zero CO₂ emissions. Cumulative carbon emissions until the time of reaching net-zero CO₂ emissions and the level of **greenhouse gas emission reductions this decade largely determine whether warming can be limited to 1.5°C or 2°C**”. It further concludes that rapid, deep and in most cases, immediate greenhouse gas emission reductions in all sectors are needed this decade to reach the goals of the Paris Agreement. Amidst its **urgent call to act** on reducing GHG gases, the IPCC also offers **a range of feasible climate mitigation options² in the near term**. The financial sector plays a key role in meeting the global climate goals. In 2015, the Paris Agreement defined in article 2.c that financial flows have to be redirected in order to reach its objective of holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit it to 1.5°C.

For the transition of the financial sector towards sustainability and, in particular, for its decarbonisation, it is necessary to understand where it stands and where it needs to go by gathering data, measuring and reporting. A process where science-based targets along scientific transition pathways are key, especially regarding climate change mitigation.

As a first effort to support the Luxembourg financial system's transition towards sustainability and its decarbonisation journey, the LSFI launched and coordinated in **2021 a Climate Scenario Analysis with the Paris Agreement Capital Transition Assessment (PACTA)**³, an open-source forward-looking methodology. This voluntary and anonymous exercise enabled participating financial institutions to measure the alignment of their investment portfolios and loan books with climate scenarios across a set of climate-critical sectors and technologies. Performing this analysis was an opportunity to raise awareness and put the climate topic at the centre of the agenda of the Luxembourg financial sector's actors, support them in integrating climate-related considerations, upskill their staff on climate analysis methodologies, help them understand how to be more aligned with the Paris Agreement goals, and anticipate regulatory requirements.

To further work on this topic, in 2023, the LSFI - following the approval of its Board of Directors - launched a working group dedicated to **Climate Measurement and Reporting**.

Launching such a working group was considered necessary to develop follow-up actions building on the 2021 PACTA exercise. In particular to be able to **further analyse and suggest tools and methodologies** for Luxembourg financial players regarding climate measurement and reporting.

¹ <https://www.ipcc.ch/report/ar6/syr/resources/spm-headline-statements>

² https://www.ipcc.ch/report/ar6/syr/downloads/figures/IPCC_AR6_SYR_Figure_4_4.png

³ <https://pacta.rmi.org/>

1.2. Objectives

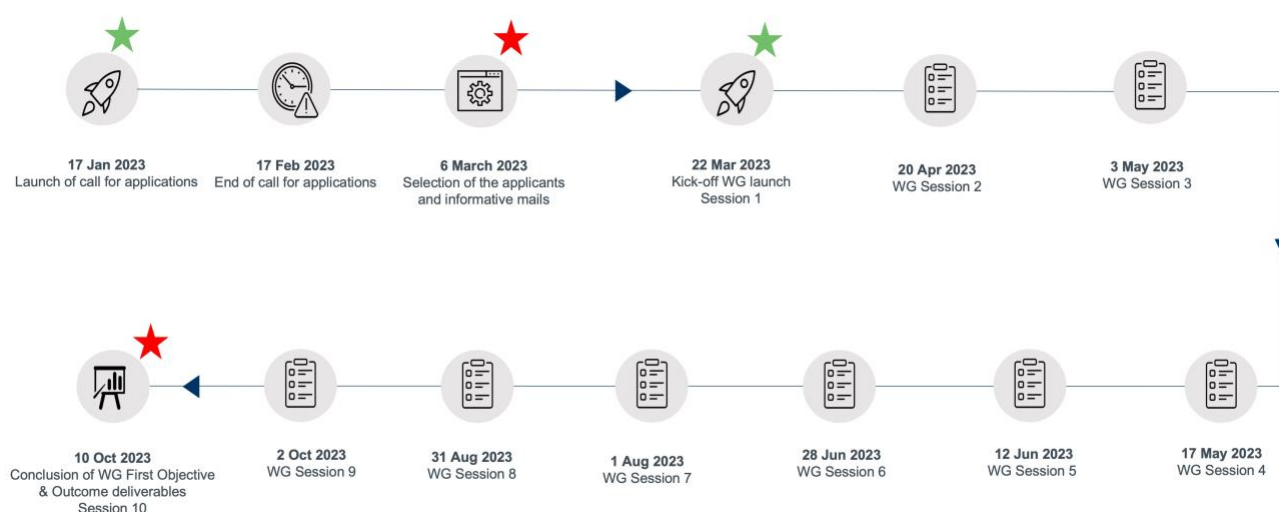
The LSFI Climate Measurement and Reporting working group focused on the following objectives:

- Propose practical tools and methodologies on climate measurements and reporting for Luxembourg financial institutions as a follow-up to the 2021 Climate Scenario Analysis. In particular,
 - Develop follow-up actions building on the 2021 PACTA exercise.
 - Suggest tools and methodologies for Luxembourg financial players and Luxembourg-wide studies on climate and/or climate-related measurement and reporting for 2023/2024.
 - Recommend climate measurement or reporting initiative(s) for the Luxembourg financial sector actors to join, if relevant.
- Exchange of information on climate measurement and reporting tools relevant to the financial industry and share key takeaways and best practices.

1.3. Timeline and Meetings

In January 2023, the LSFI launched the call for applications. The working group’s objectives, described above, were set out in its specific terms of reference. Following a selection process, the kick-off session was held in March. From that date until the publication of this analysis, **ten meetings were held** among the members, concluding with the working group’s results and suggestions that are outlined in this document.

The graph below provides an overview of the working group timeline.



1.4. Members

Following the call for applications and the selection criteria, the LSFI team and the LSFI Board of Directors selected the members. This working group has been composed of eleven professionals, including a chair and co-chair, with relevant experience and expertise in the field who contributed actively and regularly to the objectives of this working group. They represent financial industry institutions, research and education, board of directors and the consulting industry. To ensure the neutrality of the members and the quality of the work to be done, each member undersigned a Conflict-of-Interest Policy.

The working group was composed of the **following members**:

- Rudi BELLI, BCEE/Spuerkeess (Chair)
- Michael HALLING, University of Luxembourg (Co-chair)
- Mathilde BAUWIN, ADA
- Petra BESSON-FENCIKOVA, Société Générale
- Nathalie DOGNIEZ, Independent Director
- Anna ILLARIONOVA, EY
- Martin MAGER, Linklaters
- Dayo OJALEYE, INNFACT
- Ioana POPESCU, LIST
- Nathalie ROTH, 4CLIMATE
- Sarah TAGLIAROL, Edmond de Rothschild

2. Methodology

2.1. Scope

Considering that climate measurement and reporting is a broad topic, the working group established a scope, delimiting the particular aspect of climate change where to focus, the target institutions subject to the suggestions, the tools to be assessed and the characteristics to be covered by those.

Selected climate aspect

Within the overall climate spectrum, the working group decided to focus on **climate change mitigation via emissions reduction**, as well as GHG emission avoidance and emission removal to assess how to foster the financial institutions' transition and thus reach net zero.

While the role of climate change adaptation, as well as the evaluation of tools measuring financial institutions exposure to physical risks is also relevant, it was decided to leave these for a later stage. It was necessary to limit the scope to enable the group to work efficiently.

Targeted financial institutions

The working group also identified a broadly-defined target group within the financial sector.

The selected target group includes all financial institutions (credit institutions, insurance companies, asset managers, etc.) **supervised, established or registered in Luxembourg**.

This target group is the one to which the recommendations included in sections 3 and 4 are addressed to. The tools have been assessed taking the needs of those financial institutions into consideration.

Selected tools

Over the last few years, several initiatives, frameworks, standards, tools and methodologies have been developed to help financial institutions reach net zero emissions by 2050.

The working group members looked for tools and methodologies that help the targeted financial institutions on the climate dimension of their analysis. The objective was to understand **which ones these tools and methodologies are and clarify how they can**

support financial institutions' net zero journey. Following the research, several ones were selected taking multiple factors into account.

As a starting point to choose those tools and methodologies, the working group looked, for instance, at the Task Force on Climate-related Financial Disclosure (TCFD)⁴ - a universal framework widely used and recommended by regulations - and reviewed the Net Zero sector-specific initiatives part of the Glasgow Financial Alliance for Net Zero (GFANZ)⁵⁶. In addition,

the members of the working group decided to focus on those tools that are **open source, transparent and not-for-profit**. The focus was also put on methodologies/tools instead of individual data providers or data sources.

Taking these factors into account, the working group selected the following tools, which would then be analysed (in alphabetical order) (see section 3).

- Assessing Low Carbon Transition (**ACT**).
- Paris Agreement Capital Transition Assessment (**PACTA**).
- Partnership for Carbon Accounting Financials (**PCAF**)
- Science-Based Target Initiative (**SBTi**).
- Transition Pathway Initiative (**TPI**).

It is important to remark that given this space is developing rapidly, while the selected tools are representative and fulfil the working group's objectives as of the writing of this report, they might not be exhaustive.

Selected characteristics to be analysed

While the functionalities of the tools selected above are broad, the working group decided to focus on evaluating how far these can support financial institutions in Luxembourg to reach net zero emissions by 2050.

For that purpose, the tools were evaluated with respect to the **following dimensions**:

- Overall **tool information**: main purpose of the tool, and metrics produced.
- **Data**: quality/reliability of data sources used in the tool or methodology, data quality management process.
- **Data Coverage**: asset class, activity sectors, scope and number of companies covered.
- **Methodology**: transparency, applicability, financial institutions' fit, level of granularity and flexibility.
- **User-friendliness, costs of implementation**.
- **Additional features** such as report generation, user support, response / adherence to climate frameworks, etc.

Considering the current **regulatory requirements**, it was decided to also analyse to what extent those tools support financial institutions in fulfilling reporting and disclosure requirements to provide an additional layer to the analysis.

2.2. Process Followed

Definition of net zero

⁴ <https://www.fsb-tcdf.org/>

⁵ <https://www.gfanzero.com/membership/>

⁶ Other initiatives such as the Joint Impact Model (JIM)⁶ were not assessed as it is very specialised for financial institutions with operations in emerging markets.

Net zero carbon dioxide (CO₂) emissions are achieved when *anthropogenic* CO₂ emissions are balanced globally by anthropogenic CO₂ removals over a specified period. Anthropogenic emissions include emissions of *greenhouse gases (GHGs)*, *precursors* of GHGs and *aerosols* caused by human activities. These activities include the burning of *fossil fuels*, *deforestation*, *land use* and *land-use changes (LULUC)*, livestock production, fertilisation, waste management and industrial processes. Anthropogenic CO₂ removals include enhancing biological *sinks* of CO₂ and using chemical engineering to achieve long-term removal and storage.⁷

Currently, **the Earth is already about 1.1°C warmer than in pre-industrial times (1850-1900) and emissions continue to rise.** To keep global warming to no more than 1.5°C – as called for in the Paris Agreement – emissions need to be reduced by 45% in 2030 compared to 2010 levels and reach net zero by 2050⁸.

Definition of net zero steps

During the definition of the scope and the analysis of the selected tools, the working group members concluded that to reach net zero and better understand which tools to use, it was key **to define the different steps a financial institution needs to follow to reach net zero.** The infographic below outlines these steps.



The first step is to establish a reporting framework to measure emissions. In the case of financial institutions, this step is particularly challenging because scope 1 and 2 emissions of the financial institution are usually negligible. Instead, the institution needs to apply a coherent standard to measure the emissions it is financing through its business activities, commonly referred to as "financed emissions".

Next, financial institutions need to identify and select a benchmark for the transition pathway that a financial institution will be following (step 2). Such benchmarks are usually issued by global initiatives that outline how individual sectors have to decarbonise in order to reach the net-zero-by-2050 goal.

With this benchmark in place, financial institutions have to translate the selected transition pathway into specific targets set at the institution's level (step 3). Such targets could, for example, include thresholds for investment exposures to certain industries. To reinforce the target setting, financial institutions, might join one of the Net Zero Glasgow alliances (see annex IV).

⁷ <https://www.ipcc.ch/sr15/chapter/glossary/>

⁸ <https://www.un.org/en/climatechange/net-zero-coalition>

After these first three steps, the financial institutions are in a position to take action (step 4), meaning to change their business process and update their decision-making to reflect the emission targets. Main instruments of financial institutions include specific portfolio selection, as well as engagement and shareholder voting.

The second to last step then focuses on disclosing information related to the net-zero transition (step 5), either in response to mandatory regulation or in order to voluntarily inform investors and other stakeholders about the institution's transition.

Last but not least, progress in reaching the targets and in following the transition path must be monitored and evaluated (step 6). Ideally, this is done using externally validated and globally accepted principles or standards to ensure the objectivity of this assessment.

Presentations

To gain further insights into each of the selected tools, the working group asked each tool provider to give a **presentation to the working group about the tool**. These presentations followed a standardised format; all providers filled out a template in order to include information in line with the selected characteristics to be analysed, as described in the previous section.

Tools/Methodologies Analysis

Following the tool providers' presentations, the working group members performed a first evaluation of the tools. For that, each member **filled in a survey** assessing the following dimensions for each tool (survey with additional information can be found in annexe I):

- **Data quality:** data sources, data reliability, data validation and frequency.
- **Data coverage:** across time (historical data), across climate dimensions and across investment universes.
- **Tool usability and accessibility:** user-friendliness, support and implementation costs.
- **Outputs and reporting:** aggregation levels, granularity of output, peer comparisons, support for financial institutions in fulfilling reporting and disclosure requirements, consistency with climate frameworks, usefulness to help financial institutions adjust and improve their portfolios and investment decisions and partnerships with other tool providers.

In addition, working group members collected additional information, for example, to understand the **current use of these tools/methodologies** by banks, asset managers and insurance companies. As anticipated, they also examined **how these tools help respond to regulatory transparency requirements** (e.g., CSRD, SFDR, and EBA Pillar 3 on ESG). Lastly, they checked the required level of maturity of a financial institution to comply with a given methodology or to use a particular tool.

Further background analysis and discussion

To complement the analysis of individual tools and to provide additional input into the discussion within the working group, the working group members identified some **activities across the European Union that are aligned with the working group's objective**. It was decided to gain further insights into some of those by meeting the different representatives and thus trying to learn from their experience.

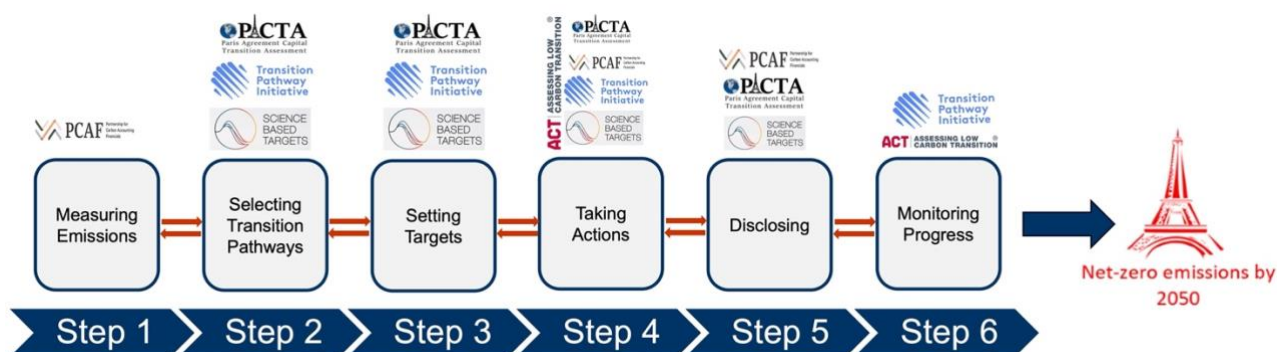
Similarly, it was decided to get an overview of major existing **initiatives, frameworks and standards** that, while not tools/methodologies per se, foster the transition towards net zero. In particular, the working group assessed the match between those broader initiatives and the tools/methodologies analysed.

3. Results of the Working Group

This section includes an overview of each tool/methodology analysed, the role they play in the decarbonisation journey, and how they respond to current regulatory requirements.

3.1. Alignment of the Tools with the Net-zero Steps

As a starting point, the working group mapped how the selected tools fit the overall decarbonisation journey taking into account the features and coverage of each of them. The infographic below shows a snapshot of this process and the tools to be used.



As anticipated in the methodology section, the first identified step is “financed GHG emissions measurement”. For this, the PCAF standard is highly recommended/to be used as it provides absolute GHG emission values considering scopes 1, 2 and 3 and it offers a harmonised approach on determining data quality and attribution of emissions.

The second step is “selecting transition pathways to net zero”, a process where tools providing scenarios such as PACTA (using Intergovernmental Panel on Climate Change – IPCC -, Network for Greening the Financial system – NGFS - and International Energy Agency – IEA - scenarios), SBTi (IEA and Integrated Assessment Modelling Consortium scenarios), and TPI (IEA 1.5, IEA 2.0, national pledges and IPCC scenarios) are key.

The third step is “setting targets”, with PACTA, SBTi and TPI being tools/methodologies that are able to support the financial institution in this effort. For instance, PACTA provides information concerning emissions intensities of high emitting sectors based on 5-year production plans, TPI offers a Sectoral Decarbonization Approach (SDA) based on emission intensities and SBTi combines a temperature rating approach with an SDA based on intensity and absolute emission information.

The fourth step consists of “taking action” where ACT, PACTA, PCAF, SBTi and TPI can be considered best choices as these can help organisations identify and prioritise actions by providing insights into the impact of various investments and projects on emissions reduction and sustainability.

The fifth step is “disclosing”, PACTA, PCAF and SBTi help in this regard as they can assist in preparing comprehensive and credible sustainability reports by providing data and insights needed for transparent disclosure.

Finally, as per the sixth step, it is key that institutions “monitor progress” over time, both TPI and ACT can support this activity. In particular, TPI offers a SDA to monitor the progress of companies within various sectors toward decarbonisation goals and ACT helps institutions

assess and monitor their progress in transitioning to a low-carbon economy, offering a holistic view of their journey over time.

Taking these steps into account, the working group does not consider that a unique tool can help the financial sector reach net zero considering the different tools/methodologies' specificities, but also the various actions that a financial institution needs to follow within the decarbonisation journey. All of them have valuable features and can play an essential role in the transition, covering different and sometimes complementing aspects of the net zero journey and, thus, not being directly comparable or overlapping in their functions.

The sections below deep dive into each tool/methodology, further explaining their function, coverage and how they fit the above-mentioned steps (additional information on each tool/methodology can also be found in annex II and III). For each of them, the working group provides a recommendation regarding its use.

3.2. Partnership for Carbon Accounting Financials (PCAF)⁹

About it

PCAF is an industry-led initiative developed in 2015 that acts as a **carbon emission measuring standard for absolute GHG emissions**. Its objective is to facilitate financial industry alignment with the Paris Climate Agreement by helping financial institutions to assess and disclose the GHG emissions associated with their financial activities (e.g., their loans and investments) through GHG accounting. The PCAF Standards are built upon the principles of the GHG Protocol (more information in annexe II and III).

What it delivers

PCAF provides a GHG emissions reporting standard for financial institutions and financial products. It introduces a harmonised approach regarding how to measure GHG emissions associated with financial activities by the use of different attribution factors and how to assess the data quality of the used emission factors. In this regard, it helps measure and disclose for financial institutions.

It also offers its signatories access to an open-source database with emission factors, based on sector averages. These emission factors will allow to start with GHG accounting at asset class level for individual lending and investing positions in financial institutions' portfolios. Next to this emission factor database, PCAF also offers a publicly available separate database with emission factors for European buildings.

Signatories also get access to the Technical Assistance Team which helps and supports the PCAF Signatories with all technical questions regarding implementing the PCAF methodologies and also receive access to the PCAF Academy which is a self-paced online learning program with individual modules for each asset class, as well as the PCAF database and GHG accounting in general. In the future additional modules will be added.

Coverage

Regarding the type of financial products covered by the standard, it is very extensive. It includes corporate bonds and listed equities, corporate loans and unlisted equity, residential mortgage loans, commercial mortgage loans, car loans, sovereign bonds, and project finance. In addition, green bonds are under development. Likewise, all sectors are eligible.

⁹ <https://carbonaccountingfinancials.com/en/>

Conclusion

PCAF is a widely accepted standard for financial institutions to measure their scope 3, category 15 emissions, which is a prerequisite for setting targets, taking action and disclosing¹⁰. It also offers a solution for financial institutions that don't have data available yet. Besides, it is a simple and flexible reporting system to measure emissions consistently across products and sectors, and it is aligned with reporting and disclosure requirements.

However, it is important to stress that it does not validate the information disclosed by the financial institutions. It also does not provide guidance on standardised emissions reports or outputs.

Considering the analysis, the working group concludes that PCAF is a very suitable and comprehensive tool to support financial institutions in their net zero transition and, thus, unambiguously recommends it to all financial institutions in the scope of the working group.

3.3. Science-based Targets Initiative (SBTi)¹¹

About it

SBTi is a **target-setting tool** for financial institutions. This initiative is a partnership between the Carbon Disclosure Project (CDP), the United Nations Global Compact (UNGC), the World Resources Institute (WRI) and the World Wide Fund for Nature (WWF). It aims to provide financial institutions with a clearly defined path to reduce emissions in line with the Paris Agreement goals. It can also be used by companies (more information in annex II and III).

What it provides

Using SBTi, its signatories can select a decarbonisation pathway and set science-based targets for emissions reduction. Following this, companies get their targets approved and validated by SBTi.

The initiative's methodology and guidance are open source. SBTi acts both as a data source of companies that set targets by providing data on those companies; as well as a target-setting tool for financial institutions.

Coverage

SBTi's coverage regarding the type of financial institutions is very extensive. It covers corporate loans, listed equity and bonds, loans (not for cars), real estate (commercial and residential), mortgages, and electricity generation project finance. Government loans and derivatives are excluded.

With regards to the sectors, all are eligible.

¹⁰ The PCAF Standard Part A: Financed Emissions is recommended by TCFD as the standard to use for measuring and disclosing of financed emissions for banks, asset owners and asset managers.

The final version of the European Sustainability Reporting Standards (ESRS) Annex I is also recommending to use the PCAF Standard Part A: Financed Emissions.

The International Financial Reporting Standards Foundation (IFRS) is referencing in their ISSB S2 Standard upon financed emissions. The U.S. Securities and Exchange Commission (SEC) is also referencing upon PCAF in their Proposed Rule on Climate-Related Financial Disclosures.

¹¹ <https://sciencebasedtargets.org/>

Conclusion

SBTi has become the industry reference for setting and validating targets of firms and financial institutions in the transition to net zero as it is the only dedicated and independent target-setting methodology.

However, it does not assess the financial institutions' progress in reaching these targets. Moreover, it does not cover activities such as insurance underwriting or capital markets underwriting and is challenging to use when integrating SMEs coverage on the lending side.

Considering the analysis, the working group concludes that SBTi is a very suitable and comprehensive tool to support financial institutions in their net zero transition and, thus, recommends it to all financial institutions in the scope of the working group.

3.4. PACTA for Investors¹²

About it

PACTA is a **climate scenario analysis tool** launched in 2018. The tool was developed by 2° Investing Initiative (2DII) a not-for-profit organization, in partnership from Principles for Responsible Investment (PRI), the University of Zurich, and the Frankfurt School of Finance¹³. Its objective is to facilitate the transparency and accountability of financial institutions with regard to their alignment with climate goals. In June 2022, 2DII transferred the stewardship of PACTA to RMI.

What it provides

PACTA assesses the 5 years forward-looking portfolio alignment with climate change scenarios based on companies' production volume and capex plans. It covers key high-emitting sectors (ca. 75% of global emissions), such as power, automotive, oil and gas, coal, steel, cement, and aviation. The analysis is based on companies' production plans at the technology level rather than emission reduction commitments.

PACTA analysis is free on the transition monitor platform and is an open-source tool. It supports the analysis of transition risks with its unique forward-looking approach and provides insightful inputs for developing climate strategies, such as engagement. It also gives insights on the portfolio's financed emissions per type of financial asset.

Coverage

In terms of financial products, PACTA covers listed equities, corporate bonds and funds. As per the sectors, as specified above, it covers key high-emitting sectors, such as oil and gas, power, automotive, aviation, cement, coal mining, and steel.

PACTA provides volume trajectory information for sectors with defined technological roadmaps, and physical emission intensities based on expected production for sectors where technological roadmaps have not been defined, such as aviation, cement and Steel.

¹² Pacta for Banks offers a climate scenario analysis for banks' loan books. Considering the limited coverage for Luxembourg SMEs, this tool version has not been considered in the tools' assessment.

¹³ Since 2022 it is operated by Rocky Mountain Institute (RMI).

Conclusion

PACTA for investors is a forward-looking tool. It creates distributions of technologies that are consistent with transition plans and compares those to actual ones and the ones predicted for the next 5 years. Thus, it offers a strategic approach for climate scenario portfolio alignment analysis, which can inform risk management. Besides, from a user-friendliness perspective, it has a good interface, the main asset classes are linked, and the system is easy to use. It is also recommended by major initiatives such as GFANZ and frameworks such as TCFD.

However, it has limited asset coverage, as it is set up to cover only most emitting sectors. Importantly, PACTA does not focus on offering explicit guidance to financial institutions on how to improve their portfolios with respect to the net zero transition.

Considering the analysis, the working group concludes that PACTA is a useful tool as it offers helpful information for individual, specific purposes and some financial institutions (e.g. portfolio analysis), but still lacks certain functionalities that are relevant considering the current needs of financial institutions.

3.5. Transition Pathway Initiative (TPI)

About it

TPI is a climate progress monitoring data tool. This global initiative led by asset owners and supported by investors globally was launched in 2015 by the Environment Agency Pension Fund and National Investing Bodies (NIBs) of the Church of England. The data partner is FTSE Russell, and The London School of Economics' (LSE) Grantham Institute is the TPI's academic partner. Its objective is to enable investors to assess, against internationally agreed benchmarks, a company's performance and its progress towards the low-carbon economy (more information in annex II and III).

What it delivers

It provides a free online database of data related to the Sectoral Decarbonisation Approach (SDA) based on benchmarks for high-emitting sectors and company emission trajectories (based on company targets) in these sectors. It indicates the alignment or non-alignment of companies' intensities with benchmark intensities, but not the degree of alignment. It also measures the performance of every company towards its individual reduction target.

In this respect, TPI provides data to allow financial institutions to align portfolios with net zero targets. It also supports financial institutions in engagement with investees and helps calculate financed emissions, which can be used for disclosure requirements.

Coverage

With regards to the type of financial products, TPI covers companies (publicly listed equities and corporate bonds issuers) from various sectors and their data can then be applied to loans and investments related to these companies. Currently, 600 companies are covered, but it is planned to expand the coverage reaching 10.000 by 2025.

The sectors covered are oil and gas, electricity utilities, automobiles, airline, shipping, cement, diversified mining, steel, aluminium and pulp and paper.

Conclusion

TPI is a data provider as well as an assessment framework. It evaluates how well firms and financial institutions match net zero targets, focusing on carbon emissions and management performance. Currently, TPI selects and evaluates firms in high-emitting sectors, as well as individual banks. Financial institutions can use TPI's data to assess companies they are investing in.

While it is a comprehensive assessment framework including physical intensities, at the moment, it only covers a limited universe of 600 firms from high-emitting sectors. In addition, there is not a fully developed methodology available for assessing financial institutions.

Considering the analysis, the working group concludes that TPI is a tool with significant potential, in particular as a data provider, but suffers from limited coverage at the moment.

3.6. Assessing Low Carbon Transition (ACT) – ACR Finance methodologies

About it

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

What ACT Finance delivers

It provides a score for the financial institution analysed, sub-divided in specific modules such as target setting, climate portfolio performance, business model or management, allowing to spot strengths and areas of improvements for a financial institution along its transition journey. The assessment is relevant only by those financial institutions which are already mature enough to have set targets and monitoring (methodology can apply to any FI, it's just that they will get a very low score and will have not so much relevant inputs).

Coverage

The ACT Finance methodology is divided in two sub-methodologies, one for investing activities and the other for banking activities. Within the investment products, it covers both equity and debt, real estate and projects, while it excludes government loans and derivatives. As per the banking ones, it includes corporate loans, real estate, auto loans, project financing, and services such as Debt & Equity underwriting.

Conclusion

ACT is a tool that offers a transition plan assessment framework, comparing what a firm says with what it does. This tool builds on SBTi for target settings matters and on PCAF for carbon accounting. It provides a very comprehensive assessment along quantitative and qualitative dimensions. In addition, it reports on physical intensities, comparable to TPI, and is TCFD aligned.

However, at the moment, **it is only available for companies in the real economy**, as the module for financial institutions is currently in a test phase. In addition, its methodology is hard

to assess because it is very complex and depends on a large number of weights and parameters.

Considering the analysis, the working group concludes that while the ACT methodology has a lot of potential, especially to track progress, it is at a stage that is too early to recommend it to financial institutions, which are the target of this working group.

3.7. Response to Regulation

The EU Sustainable Finance Action Plan adopted in 2018 set clear expectations for financial institutions to reorient capital flows towards a more sustainable economy and mainstream sustainability into risk management, fostering transparency and long-termism. Financial market participants should ensure access to reliable climate data and measurements to meet these objectives and the evolving regulatory requirements.

This chapter looks at regulations such as Sustainable Finance Disclosure Regulation (SFDR), EU Taxonomy and European Banking Authority Reporting Requirements (EBA), where we see the potential to apply the discussed above climate measurement tools to strengthen the sustainability disclosures and to provide the financial sector with the opportunity to assess the carbon footprint of their portfolios, products and operations, setting dedicated climate goals.

More detailed information regarding international and EU frameworks and standards, and the main regulatory requirements where these climate measurement tools can be used can be found in annexe V.1 and V.3.

Sustainable Finance Disclosure Regulation (SFDR)

Entity Level: Assessment and integration of sustainability risks (SFDR art.6)

As per SFDR¹⁴ article 6, the assessment and integration of sustainability risks at entity level applies to all the financial products under the SFDR scope. Among the analysed tools/methodologies, PCAF is the most adequate option to support as it is a methodology to measure emissions. Measuring emissions or carbon intensity are key input to risk assessment.

In addition, PACTA can help respond to those requirements, too. While it is not a risk assessment tool per se, PACTA alignment and stress-testing features can inform the description and design of risk management practices. It could be used as part of risk assessment and transition risk management to the extent scenarios deem relevant risks and investments are held in high-emitting sectors.

Finally, TPI can be a potential source of data on companies' carbon intensity, which can be used for risk assessment.

Product Level: How environmental characteristics/objectives are met (SFDR art.11)

As per SFDR article 11, the disclosure on how environmental characteristics/objectives are met at product level applies to products with environmental characteristics or objectives. In particular, the regulation requires to respond to the following: "To what extent was the sustainability investment objective met/were the environmental characteristics met?" and "How did the sustainability indicators perform?".

¹⁴ It is a regulation developed by the European Commission to improve transparency in the market for sustainable investment products, prevent greenwashing and increase transparency around sustainability claims made by financial market participants. It imposes comprehensive sustainability disclosure requirements covering a broad range of environmental, social & governance (ESG) metrics at both entity- and product-level.

PCAF can be helpful considering that carbon emission/intensity are relevant KPIs to assess if environmental objectives are met. In addition, a positive change in Principal Adverse Impacts (PAIs) over time can be used to describe an environmental goal.

In the case of PACTA, the portfolio exposure or future alignment this tool delivers could be considered a KPI if relevant to the product objective.

SBTi could also be used to respond to this requirement in those cases when decarbonisation is an objective. However, it should be noted that SBTi is designed for validating targets at the company or financial institution level, rather than at the portfolio level. It could also be used to set targets or as a data source of targets of underlying investment companies.

Likewise, TPI could serve as a potential source of data on companies' carbon intensity (current and forecast); however, it must be noted that companies' current scope is limited.

Product Level: Climate-related PAIs (Carbon emissions/intensity) (SFDR art. 7)

While reporting on Climate-related PAIs is optional as per SFDR and often depends on the fund's strategy, reporting on those is often required for aggregation at the manager level. In particular, which tools could help respond to "Does this financial product consider PAIs?" has been analysed.

In this case, only PCAF could be useful as it provides relevant guidance regarding calculating climate-related PAIs. However, it should be noted that managers shall ensure that the implementation of PCAF methodology is aligned with ESA's joint statement¹⁵.

EU Taxonomy Regulation

Product level: Taxonomy Alignment (SFDR art.11/ TR art. 5/6)

As per SFDR article 11, Taxonomy Alignment at product level applies to products with environmental characteristics/objectives. The assessment has checked whether any tool can help respond to "To what minimum extent are sustainability investment with environment objective aligned with the EU Taxonomy?". However, none of the tools analysed can support this as the criteria to determine whether an investment is taxonomy-aligned goes beyond climate considerations.

European Banking Authority Reporting Requirements (EBA)

The EBA "Pillar 3 ESG - template 1" on climate change transition risks breaks down exposures in climate-relevant sectors by credit quality, residual maturity and GHG. PCAF can help respond to this requirement as it provides information on GHG emissions using a five-step data quality scale and, thus, enabling firms to report a quality score from 1 to 5.

The EBA "Pillar 3 ESG - quantitative - template 2" on climate change transition risk includes information on the distribution of real estate loans and advances and of repossessed collateral by energy consumption and by EPC label of the collateral. PCAF, in this context, can be valuable by providing additional information specifically related to mortgage loan exposures, which contributes to a more comprehensive assessment of climate-related risks in the financial sector.

¹⁵ Managers must ensure that the implementation of the Partnership for Carbon Accounting Financials (PCAF) methodology aligns with the regulatory guidelines set by the [European Supervisory Authorities \(ESA\)](#) to promote consistency in carbon accounting and reporting practices.

The EBA “Pillar 3 ESG - quantitative - template 3” on indicators of potential climate change transition risk requires institutions to disclose information on their alignment efforts with the objectives of the Paris Agreement for a selected number of sectors. Tools providing scenarios, such as PACTA (average share of technology) and TPI (physical intensities), can help.

3.8. Context Highlights

As anticipated, during the selection of the scope and the tools assessment, the working group members also zoomed into other initiatives, frameworks and standards. While they are not necessarily methodologies or tools for the decarbonisation process per se, they can provide guidance and support for the assessment process performed by the working group.

This section defines some of those, additional ones and further details can be found in annex 1 and 2.

The **Austria Green Finance Alliance (GFA)**¹⁶ is an initiative of the Austrian Federal Ministry of Climate Action to develop a sustainable financial market culture in the country. The initiative gathers members who pledge to align their core business portfolios and operational ecology with defined climate targets. In particular, members of this initiative have to meet predefined criteria, and the GFA team accompanies them step-by-step on the path to setting and meeting their climate targets.

The **Glasgow Finance Alliance Net Zero (GFANZ)**¹⁷ is a network founded in 2021 to expand the number of net zero-committed financial institutions and to establish a forum for addressing sector-wide challenges associated with the net-zero transition, helping to ensure high levels of ambition are met with credible action.

The **Net Zero Commitment**¹⁸ is a Global Research Agency established in Switzerland. In general terms, their objective is to help corporations assess climate risk. It fosters relationships between members with goals, activities and services on Net Zero Commitment, ESG and Public Affairs.

The **Swiss Climate Score**¹⁹ is a voluntary instrument developed in close cooperation between the financial sector and NGOs in Switzerland. The Climate Score creates forward-looking transparency about the future achievement of climate goals by providing scores. These scores do not focus on distinguishing between “sustainable” and “non-sustainable”, but on capturing the extent to which companies are positioned for the necessary transition to net zero.

The **Financial Stability Board (FSB)** created the **Taskforce on Climate-related Financial Disclosures (TCFD)**²⁰ to develop recommendations on the types of information that companies should disclose to support investors, lenders, and insurance underwriters in appropriately assessing and pricing a specific set of risks related to climate change. In 2017, the TCFD released climate-related financial disclosure recommendations designed to help companies provide better information to support informed capital allocation. Those disclosure recommendations are structured around four thematic areas representing core elements of how companies operate: governance, strategy, risk management, and metrics and targets. The four recommendations are interrelated and supported by eleven recommended disclosures that build the framework with information that should help investors and others

¹⁶ <https://www.bmk.gv.at/en/green-finance/alliance/about-us.html>

¹⁷ <https://www.gfanzero.com/>

¹⁸ <https://www.netzero-commitment.org/>

¹⁹ <https://www.sif.admin.ch/sif/en/home/swiss-climate-scores/brief-summary.html>

²⁰ <https://www.fsb-tcfid.org/>

understand how reporting organisations think about and assess climate-related risks and opportunities.

4. Working Group Members Recommendations

Considering the analysis, the criteria that guided the tool/methodologies selection²¹ and the current needs and requirements of the financial sector, the LSFI Working Group on Climate Reporting and Measurement identified a set of actions to be conducted by the LSFI to support the financial sector in its decarbonisation journey.

In the short term, the LSFI, as a coordinating entity, is recommended to support the Luxembourg financial sector in using PCAF as a first priority, and SBTi as a second priority.

As previously explained, all the tools analysed are relevant and complementary. The recommendation of PCAF and SBTi as priorities is linked to the current needs of the sector, the sequence of different steps needed to reach net zero and the tools' maturity for application at financial institutions. In particular, PCAF is the only one that supports institutions on the first necessary step, measuring emissions, while it also helps to take actions and disclose. In the case of SBTi, it represents a comprehensive methodology to select transition pathways, set targets and become ready to take actions. In addition, both methodologies are highly recognised and widely used tools within the global financial sector.

In the medium term, the working group recommends closely monitoring the developments of the five tools analysed and the overall market for GHG-emission-based mitigation tools.

5. LSFI Next Steps

Going forward the LSFI will work on implementing the outcome and the suggestions of the Climate Reporting and Measurement working group members. As a first step, it will assess the best way forward to support the Luxembourg financial sector in using PCAF (first priority) and SBTi (second priority). For doing so, it will gather feedback from existing users, deep dive into the methodologies, continue the discussion with the tools' providers and establish a regular conversation with the financial industry. The LSFI will also host public sessions to first disseminate the analysis and the suggestions of the working group and, in a second stage, to deep dive into the tools/methodologies, further contributing to upskilling.

The LSFI also remains open to comments regarding the analysis conducted and welcomes feedback from current users regarding the tools assessed.

²¹ The working group focused on tools/methodologies that are **open source, transparent and not-for-profit**. The focus was also put on methodologies/tools instead of individual data providers or data sources.

6. Annexes

I. Survey to assess the different tools/methodologies presented during the WG's sessions

The WG members were required to compile one survey for each tool/methodology that had been presented to them before during the WG sessions. WG members were instructed to include an explaining comment to substantiate the answer whenever the answer was EXCELLING (i.e., the best one possible) or UNSATISFACTORY (the worst one possible).

Subtitle: DATA QUALITY

- In terms of **data source reliability / quality** (e.g., dependency on one data vendor, comparison of data amongst various sources, etc.), the tool/methodology is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

- In terms of **data source validation** (e.g., data validation process, third party verification, etc.), the tool/methodology is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

- In terms of **data source updates** (e.g., frequency, processes, etc.), the tool/methodology is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

Subtitle: DATA COVERAGE

- In terms of **data source coverage** (e.g., climate measures / metrics: absolute / relative emissions, carbon intensity, GHG scope 1, 2, 3, point in time / historical time series / forward-looking, emission factors, data availability: free data, paid data, methodology applied if no data is available, etc.), the tool/methodology is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

- In terms of **investment universe coverage** (e.g., sectors, activities, geographies, financial products: equity, bonds, mortgages, etc.), the tool/methodology is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

Subtitle: TOOL USABILITY AND ACCESSIBILITY

- In terms of tools **user-friendliness & additional support** (e.g., guidelines, webinar, ad hoc support, etc.), the tool/methodology is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

- In terms of tools **implementation cost** (e.g., license cost, materials, personnel, etc.), the tool/methodology is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

Subtitle: OUTPUTS/REPORTING

- In terms of **output** (e.g., results understanding / usability, granularity, aggregation to portfolio level, aggregated results, peer comparisons, etc.), the tool/methodology is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

- In terms of **provided output**, the tool/methodology's **ability** to support financial institutions to **fulfil their regulatory and reporting requirements** (e.g., SFDR, taxonomy, etc.), is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

- In terms of **response / adherence to climate frameworks** (e.g., TCFD, NGFS, etc.), the tool/methodology is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

- In terms of **provided output**, the tool/methodology's **support** for financial institutions to **adjust and improve their investment decisions** (e.g., financial products or portfolio composition, etc.), is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

- In terms of **partnerships** (e.g., joint projects / synergies with other tools / methodologies, future plans and tools developments, etc.), the tool/methodology is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

- In terms of **flexibility** for financial institutions to **tailor the outputs to their needs** (e.g., charts / results customisation, ad hoc report, etc.), the tool/methodology is:
(Excelling, Satisfactory, Unsatisfactory, N/A)

If Excelling or Unsatisfactory, please explain why in this box:

List any additional **benefits** of the tool that should be taken into consideration:

List any additional **disadvantages** of the tool that should be taken into consideration:

Subtitle: OVERALL ASSESSMENT

- In terms of **overall assessment**, how would you rate the tool/methodology:
(Excelling, Satisfactory, Unsatisfactory)

If Excelling or Unsatisfactory, please explain why in this box:

I. Overview of tools included key benefits and weaknesses

PACTA (for investors)	Key Benefits	Forward-looking & strategic approach based on 5-year production plans. Covers high emitting sectors (technology production pathways for power, oil & gas, coal mining and automotive; emission intensities also for cement, steel and aviation). Applies sectoral approach. Offers physical intensities (e.g., tons of CO2 per passenger km). Comes with a good interface. Main asset classes are linked. Is easy to use. TCFD and GFANZ recommend PACTA.
	Key Weaknesses	Has limited coverage. Little guidance to help financial institutions improve (the output is not at the right level of detail for this purpose). Some debatable methodological aspects (e.g., concept of ownership used, scale of green firms applied, no differentiation between products and firms – green bonds of brown firm). Only time horizon of 5 years.
	Asset Classes	Corporate bonds, listed equity, funds (matching based on ISINs).
	Scenarios	For emissions (beyond-2-degree-scenario from IEA and others). For production plans different scenarios from IEA, JRC, ISF and IPR.
	FI Maturity Req.	Beginner as only portfolio information/identifier has to be communicated to PACTA (PACTA then identifies the holdings and matches those from high-emitting sectors to the transition process assessment).
	Mapping to steps to reach net zero	Measuring Emissions; Taking Actions; Disclosing
PCAF	Key Benefits	Widely accepted (incl. the legal industry) as a framework for FIs to measure their scope 3, category 15 emissions according to the GHG Protocol. Presents data quality scores and attribution calculations. Offers solutions if a user does not have required data in place. Simple and flexible framework to measure emissions in a consistent way. Key building block for various mandatory and voluntary reporting initiatives.
	Key Weaknesses	No validation of the outcomes. No standardized reports or output. The use of the tool is limited to financial actors, advisors are excluded from free use.
	Asset Classes	Listed equity and corporate bonds, business loans and unlisted equity, project finance, commercial real estate, mortgages, motor vehicle loans, sovereign bonds.
	Scenarios	Not applicable.
	FI Maturity Req.	Beginner: the framework is simple; there is a phase-in for scope 3 emissions; varying quality levels of used/available data can easily be considered.
	Mapping to steps to reach net zero	Measuring Emissions; Taking Actions, Disclosing

ACT	Key Benefits	Forward-looking & strategic approach. Builds on SBTi (for target setting) and PCAF (for carbon accounting). Very comprehensive assessment along quantitative and qualitative dimensions. Comparable to TPI but more comprehensive. Reports include physical intensities. TCFD aligned.
	Key Weaknesses	Developed for firms in the real economy. Module for FIs is only in the road test phase. Difficult to assess robustness of results given the methodology's complexity and the large number of weights and parameters used in the calculations.
	Asset Classes	ACT banks (commercial lending, mortgages, auto loans); ACT investors (public listed and private equity, VC, corporate bonds, real estate and infrastructure).
	Scenarios	Among others IEA's Net Zero by 2050 (NZE2050), NGFS' Net Zero scenarios, University of Technology Sydney's One Earth Climate Model, PRI Inevitable Policy Response 1.5°C Required Policy Scenario.
	FI Maturity Req.	Intermediate/advanced: once a financial institution decides to use ACT, it has to hire a consultant who will then advise (but also supervise) it in following the ACT process. While this simplifies things, the institution still has to have PCAF and SBTi in place to start using ACT.
	Mapping to steps to reach net zero	Monitoring Progress
SBTi	Key Benefits	The only dedicated target-setting framework that validates the targets and is independent. Absolute and intensity-based sectoral approach. Requires near term and longer-term net-zero targets.
	Key Weaknesses	Does not cover all activities. The focus is on high-emitting sectors. Difficult to adapt for SME coverage on the lending side. SBTi does not assess progress to reach the targets.
	Asset Classes	Very general and broadly applicable framework. Based on Sectorial Decarbonization Approach (SDA) for residential mortgages, commercial real estate, electricity generation project finance, corporate debt and equity. Mandatory target setting for some asset classes and optional for others. Aggregate group level target setting.
	Scenarios	SDA builds on the Beyond 2°C scenario (B2DS) from the International Energy Agency report, Energy Technology Perspectives 2017.
	FI Maturity Req.	Intermediate: setting targets for a broad portfolio of investments or loans will be challenging. SBTi pushes engagement and does not consider divestment to be valid for target setting. Good guidance documentation and online training tools available.
	Mapping to steps to reach net zero	Selecting Transition Pathways; Disclosing

TPI	Key Benefits	Forward-looking based on companies' reported targets. Physical Intensities (i.e., absolute emissions scaled by technology units). Uses the Sectoral Decarbonization Pathways (SDA) to derive sector-specific GHG intensity benchmarks for eleven high-emitting sectors (electricity, oil & gas, diversified mining, cement, steel, shipping, aviation, paper and aluminium, and automotive sector).
	Key Weaknesses	Very small universe of 600 firms currently covered. No comprehensive methodology for the evaluation of financial institutions available (that financial institutions could use as guidance for their own transition). Companies' targets are not validated.
	Asset Classes	Listed equities, corporate bonds, sovereign bonds (9 pilot countries).
	Scenarios	Uses IEA scenarios of 1.5 degrees, below 2 degrees and 2.6 degrees (National Pledges Scenario). Scenarios are applied in a sector-specific way.
	FI Maturity Req.	Beginner (use TPI's data): financial institutions can just use TPI's data. Preparing a financial institution for an evaluation from TPI requires more maturity (e.g., PCAF and SBTi need to be in place).
	Mapping to steps to reach net zero	Monitoring Progress

II. Detailed summary table of analysed tools

Tool	Type	Tool use outcome // What does the tool deliver?	Data sources & Data/Results retrieval from tool	Data quality
PCAF	<p>PCAF, is a GHG Emissions Measuring Standard.</p> <p>> it's an industry-led initiative; developed in 2015</p>	<p>Standardized GHG emissions reporting framework (measurement and disclosure) for FIs and all financial products.</p> <p>PCAF introduces a standardized method/harmonized approach in relation to stating GHG emission data quality and attribution of GHG emissions to a financing activity.</p> <p>PCAF collaborates with SBTi and has also partnerships with e.g., CDP. CDP will align it's database with the PCAF Data Quality Scores and integrate them. PCAF is used by ACT framework.</p>	<p>Free database for emissions available to FIs committing to PCAF (Emission factors for estimation can be retrieved from PCAF database via excel and mapped with individual lending and investing positions in FI's portfolio):</p> <ul style="list-style-type: none"> > monetary-based emission factors from EXIOBASE. > physical-based emission factors from other sources (FAOSTAT, EEA, IPCC, UK DEFRA); > building emissions data for Mortgages and CRE asset classes. > Data quality score 1&2: data has to be directly retrieved from the company on which the FI is exposed. FIs would need to pay to purchase another dataset of emissions; PCAF Signatories can use PCAF logo, but there is no verification of claim. 	<p>Data is not per se provided, but FIs have access to emission factors database, if they sign up; framework is otherwise robust. Emission factors for European buildings are publicly available via a separate database (based on CRREM datasets).</p>
PACTA for Investors (considered)²²	<p>PACTA, is a Climate Scenario Analysis Tool;</p> <p>> not-for-profit organization; free, open-source tool; launched in 2018; it's a partnership from PRI, University of Zurich, and Frankfurt School of Finance.</p> <p>PACTA is an approach based on a climate alignment method, analysing technological alignment of portfolios with climate scenarios.</p>	<p>It computes the portfolio alignment with a climate scenario; it's covering high-emitting sectors (75% of global emissions)</p> <p>It computes the portfolio alignment with a climate technological alignment of portfolios based on 5-year production volume and capex plans compared to climate technology & sector decarbonization trajectories; covering high-emitting sectors (75% of global emissions). It looks at near-term changes in companies' production plans on technology level rather than long-term emission reduction commitments.</p> <p>Usage: it's forward looking, helps to manage transition risks, informs exclusion and portfolio reweighting policies, provides input for target setting and indirect input for engagement strategies. It allows to have an insight into the financed emissions of a portfolio of covered sectors.</p>	<p>FIs need to create an excel file containing the ISIN code, the currency, and the amount from their portfolio(s). This file has simply to be uploaded to PACTA's website which then produces an alignment reporting that can be downloaded by the FIs;</p> <p>PACTA for investors needs 2 days to be completed while PACTA for banks needs 30 days to be completed;</p> <p>if one needs access to underlying data, FI has to pay (e.g. 50k asset4 data); otherwise, all final results based on proprietary data are offered for free from PACTA.</p>	<p>Data is from third party; it does not cover all sectors, but enough coverage focusing on high emitting, most climate relevant sector.</p>

²² Pacta for Banks offers a climate scenario analysis for banks' loan books. Considering the limited coverage for Luxembourg SMEs, this tool version has not been considered in the tools' assessment.

Tool	Type	Tool use outcome // What does the tool deliver?	Data sources & Data/Results retrieval from tool	Data quality
<p align="center">SBTi</p>	<p>SBTi, is a Target Setting Tool;</p> <p>> it is a partnership between CDP, the United Nations Global Compact, World Resources Institute (WRI) and the World Wide Fund for Nature (WWF); the framework for FIs was launched in 2018 (under refinement)</p>	<p>It selects decarbonization pathway and sets science-based targets for emissions reduction; companies have two years after commitment date to get their targets approved and published via SBTi.</p>	<p>All methodology and guidance is open-source;</p> <p>SBTi as data source for companies with the following targets:</p> <ul style="list-style-type: none"> > Data on individual companies taking action and on yearly progress can be downloaded in Excel file from SBTi website; > This data has then to be mapped with the FI's portfolio data in order to calculate the average temperature target of the portfolio; SBTi target setting for FIs: > to submit and have target validated the SBTi charges a fee (e.g., Financial institution target submission \$14,500); > SBTi offers methodological pdfs for each scenario setting type; > Institutions should get in touch with SBTi before starting target-setting process; > The results of the validation are ready within 60 business days from the date the contract is fully executed by both parties provided that any queries for further information or clarification sent by the Target Validation Team are resolved within 2 business days. > Companies need to source their own data for target setting 	<p>Companies must have their own data; only the methodology and the calculation formulas are provided (these seem robust).</p> <p>Companies with SBTi target need to re-state and re-validate their targets every five years. SBTi does not validate the companies' compliance with past targets.</p>
<p align="center">TPI</p>	<p>TPI is a Climate Progress Monitoring data Tool.</p> <p>> data partner & funding from FTSE Russell, LSEG; research from LSEG Grantham Institute; launched in 2017</p>	<p>Data on the progress made by banks on their decarbonization path.</p> <p>It provides free online database of Sectoral Decarbonisation Approach (SDA) based benchmarks for high emitting sectors and company emission trajectories (based on company targets) in these sectors. It does not aggregate companies on portfolio level, but the user can do it on its own.</p> <p>It indicates alignment or non-alignment of companies' intensities with benchmark intensities but not the degree of alignment.</p> <p>It measures the performance for every company individual reduction target.</p> <p>Usage: TPI provides data to allow FIs to align portfolios with net zero targets. It supports FIs in engagement with investees and inform voting. It helps to calculate financed emissions, which can be used for disclosure requirements.</p>	<p>The data (physical carbon intensity, current and forecasted) relating to Individual companies can be downloaded from the TPI's website via an excel. This data has then to be mapped with the FI's portfolio data in order to perform calculations by the FI on its own (example: calculation of the weighted average carbon intensity in the FI's portfolio and to be compared sectoral transition pathway from TPI to define the alignment gap).</p>	<p>Assessment based on company report</p>

Tool	Type	Tool use outcome // What does the tool deliver?	Data sources & Data/Results retrieval from tool	Data quality
<p>ACT</p>	<p>It's a progress assessment tool.</p> <p>> funded by French government and EU funds; ACT methodology implemented since 2015 in 15 sectors; in 2023 they start with Finance sector and do a road-test for banks and investors.</p>	<p>It provides a score for the FIs, sub-divided in modules (target setting, climate portfolio performance, the business model, management...), allowing to spot strengths and areas of improvements for a financial institution. The assessment is relevant for those financial institutions which are already mature enough to have set targets.</p>	<p>No data quality to assess as it is a framework for assessment itself.</p> <p>The methodology seems robust and complex, with many aspects covered. it is based on data and reports from the company side.</p> <p>Hire a consultant that is trained to the methodology (current estimated cost ~10K€); Assessment report of the FI, on each of the modules</p> <p>Be available for kick-off meeting, data request and explanations, follow-up points and wrap-up delivering the results.</p>	<p>N/A</p>

III. Overview of the coverage of the tools

Tool	Asset Class Coverage	Sectoral coverage	Scope Coverage	Number of Companies covered
PCAF	Corporate bonds and listed equities; Corporate loans and unlisted equity; Residential mortgage loans; Commercial mortgage loans; Car loans; Sovereign bonds; Project finance; > derivatives would be good to be added; green bonds in preparation.	All sectors are eligible.	List of sectors with required scope 3 emissions inclusion as defined by the EU TEG48: > From 2021 At least energy (oil & gas) and mining (i.e., NACE L2: 05-09, 19, 20); > From 2023 : At least transportation, construction, buildings, materials, and industrial activities (i.e., NACE L2: 10-18, 21-33, 41-43, 49-53, 81); > From 2025 : Every sector	Framework helping financial institutions assess and disclose the GHG emissions from their loans, investments and underwriting activities through GHG accounting. GHG accounting enables FIs to disclose these emissions at a fixed point in time and in line with financial accounting periods.
PACTA for Investors (considered) PACTA for Banks (excluded)	Loan books (it requires 10-15 days for matching between bank and PACTA); Listed equities; Corporate bonds.	Oil & gas upstream sectors; Power; Auto manufacturing; Aviation; Cement; Coal mining; Steel.	Scope coverage is based on Asset Impact methodology. It is a non-GHG methodology and only considers the 5-year production plans of the company itself - i.e., direct impacts. However, for the 3 following sectors: Steel, Cement, Aviation, it considers a physical GHG intensity metric. A physical GHG intensity metric can be calculated for all sectors, with Asset Impact considering the following scopes: Scope 1 for Aviation, Scope 1+2 for Power, Cement and Steel, Scopes 1- 3 for Fossil Fuels and Auto.	242k physical assets; 48k funds; 800k bonds; 51k equities
SBTi	Corporate loans; listed equity and bonds; loans (not for cars): real estate (commercial and residential), mortgages electricity generation project finance. Are excluded: government loans, derivatives.	All sectors are eligible; there are the finalized guidance documents for the following sectors: > Apparel and Footwear > Cement > FIs > Forest, Land and Agriculture (FLAG) > Information and Communication Technology (ICT) >Maritime Power	Financial institutions' borrowers' and/or investee's targets shall include coverage of scope 1 and 2 emissions, as well as scope 3 emissions when their scope 3 emissions are more than 40 percent of total scope 1, 2, and 3 emissions	More than 4000 companies setting targets with SBTi - as of end of 2022
TPI	TPI covers companies from various sectors. Their data can be then applied to loans/investments related to these companies (for green bonds it does not apply, as the	Oil & Gas. Electricity Utilities. Automobiles. Airlines; Shipping; Cement;	Uses IEA scenarios of 1.5 degrees, below 2 degrees and 2.6 degrees (National Pledges Scenario). Scenarios are applied in a sector-specific way.	600 industrial companies assessed by TPI (carbon performance and management performance) ²³ ; TPI has developed a assessment framework for banks in which it assesses about 30 of the biggest

²³ Expected Coverage expansion to 10,000 companies on carbon performance by 2025.

Outcome Report – LSFI Climate Measurement & Reporting Working Group

Tool	Asset Class Coverage	Sectoral coverage	Scope Coverage	Number of Companies covered
	use of proceeds must be known.	Diversified mining; Steel; Aluminium; Pulp and Paper.		banks (26 banks to be assessed annually against the TPI Centre's Banking Assessment Framework)
ACT	Investing specific: Equity and Debt (listed and private); Real Estate; Project finance. Are excluded: government loans, derivatives. Banking specific: corporate loans; real estate; auto loans; project financing; Debt & Equity underwriting.	Not applicable, depends on the exposure of FI.	Relevant scope 1, 2 and 3 (where significant) for financed companies' emissions.	N/A

IV. Context in-depth analysis

1. Net Zero Initiative/Commitments

Net Zero Initiative // Commitments	Climate & Reporting	What is it about?	Measuring/Transition Pathways/Target Setting
<u>Net Zero Commitment</u>	<u>Initiative: Net Zero Banking Alliance</u>	Banks committed to align their lending and investment portfolios with net-zero emissions by 2050. Set scientific targets.	<p>Measuring Baseline Financed GHG emissions Scope 1,2& 3: PCAF</p> <p>Transition Benchmark Pathways Banks have to define which scientific benchmark pathways (under which climate scenarios) they use: SBTi, TPI can provide data on sectoral benchmark pathways as well as on companies which have set targets under SBTi or for which TPI has derived targets.</p> <p>Targeting Banks have to set targets in Absolute and/or Physical intensities (sectoral). NZBA foresees a gradual implementation of climate targets starting with most climate intense sectors or activities. Banks can refer to SBTi 's as well as TPI's data basis to retrieve alignment data on individual companies they hold in their portfolio. (target process limited to their current coverage of companies).</p>
<u>Net Zero Commitment</u>	<u>Net Zero Asset Managers Initiative (NZAMI)</u>	The Net Zero Asset Managers initiative is an international group of asset managers committed to supporting the goal of net zero greenhouse gas emissions by 2050 or sooner, in line with global efforts to limit warming to 1.5 degrees Celsius; and to supporting investing aligned with net zero emissions by 2050 or sooner.	<p>Measuring Take account of portfolio Scope 1 & 2 emissions and, to the extent possible, material portfolio Scope 3 emissions (PCAF methodology can be applied).</p> <p>Transition Benchmark Pathways The basic NZAM engagement is to reduce the CO2 emissions of the asset mangers' investment portfolio by 50% by 2030, as the interim target.</p> <p>Targeting SBTi is one of the recommended methodologies – the asset managers are engaging either on the portfolio alignment via SBTi temperature model or on the rate of issuers in portfolios with a “science-based” net zero trajectory</p>
<u>Net Zero Commitment</u>	<u>UN-convened Net-Zero Asset Owner Alliance (NZAOA)</u>	Member-led initiative of institutional investors committed to transitioning their investment portfolios to net-zero GHG emissions by 2050 – consistent with a maximum temperature rise of 1.5°C.	<p>Measuring CO₂ reduction ranges for 2025 (22 – 32%) and for 2030 (40% – 60%).</p> <p>Transition Benchmark Pathways Transition of investment portfolios to net-zero GHG emissions by 2050 consistent with a maximum temperature rise of 1.5C degrees above pre-industrial temperatures, taking into account the best available scientific knowledge including the findings of the IPCC, and regularly reporting on progress, including establishing intermediate targets every five years</p>

Net Zero Initiative // Commitments	Climate & Reporting	What is it about?	Measuring/Transition Pathways/Target Setting
			in line with Paris Agreement Article 4.9. Targeting Global asset owners committed to decarbonising their investment portfolios and achieving net-zero emissions by 2050.
<u>Network for Greening the Financial Sector (NGFS)</u>		Help strengthening the global response required to meet the goals of the Paris agreement and to enhance the role of the financial system to manage risks and to mobilize capital for green and low-carbon investments in the broader context of environmentally sustainable development.	

2. Frameworks & Standards

Frameworks & Standards	Climate & Reporting	What is it about?	Measuring/Transition Benchmark Pathways/Target Setting
TCFD Framework		Encourage organizations to disclose climate-related risks and opportunities in their financial reporting. TCFD provides recommendations for voluntary, consistent, and transparent reporting on the financial impacts of climate change, helping businesses and investors assess climate-related risks and make informed decisions. Its guidelines cover governance, strategy, risk management, and metrics related to climate risks and their potential effects on organizations' operations, financial position, and future prospects.	<p>Measuring PCAF is endorsed by TCFD; https://www.cdp.net/en/articles/investor/pcaf-and-cdp-enable-financial-institutions-to-measure-and-disclose-financed-emissions</p>
EFRAG Reporting Standard (ESRS)	ESRS E1 Climate Change (reference document = Draft European Sustainability Reporting Standards (EFRAG))	The standard describes disclosure requirements related to Climate Change (see page 6. Objectives) and takes into account the requirements of EU-related legislation & regulation (EU Climate law, Climate Benchmark standard regulation. SFDR, EU Taxonomy, EBA Pillar 3 disclosure requirements)	<p>Measuring Sub-Standards E1-6 Gross Scope 1,2,3 and total GHG emissions: Scope 1,2& 3 stemming from own operations and Scope 3 (cl 15) financed GHG emission. For Measuring purposes PCAF is recommended.</p> <p>Transition Benchmark Pathways The disclosure under paragraph 15(a) shall be benchmarked in relation to a pathway to 1.5°C. This benchmark should be based on either the sectoral decarbonisation methodology if available for the undertaking's sector or the absolute contraction methodology bearing in mind its limitations (i.e., it is a simple translation of emission reduction objectives from the State to Corporate level).</p> <p>Targeting Sub-Standard E1-4: Targets related to climate change mitigation and adaptation (32.a disclose in absolute value and if deemed in intensity value; 32.d include targets at least for 2030 and if available for 2050;) For Target Setting in climate change mitigation, refer to the comment under Net Zero Commitment.</p>
<u>ISSB Reporting Standard ("climate related")</u>	<u>IFRS S2 Climate Change</u>	The standard requires an entity to disclose information about climate-related risks and opportunities that could reasonably be expected to affect the entity's cash flows, its access to finance or cost of capital over the short, medium or long term (collectively referred to as 'climate-related risks and	<p>Measuring Climate-Related metrics - including: Greenhouse Gas (GHG) - disclosure of an entity's absolute gross GHG emissions generated during the reporting period, expressed as metric tonnes of CO2 equivalent under Scope 1, 2 and 3, measured in accordance with the GHG Protocol – 2004; the measurement approach input and assumptions used, the reasons the approach was chosen and reasons for any changes made to the choice over time. For scope 3 GHG emissions, disclose the categories within the entity's measure, as described</p>

Frameworks & Standards	Climate & Reporting	What is it about?	Measuring/Transition Benchmark Pathways/Target Setting
		<p>opportunities that could reasonably be expected to affect the entity's prospects').</p>	<p>in Greenhouse Gas Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011) including additional information on the entity's Category 15 GHG emissions, as well as those of its investments. For Measuring purposes PCAF is recommended.</p> <p>Targeting Climate-Related targets, including disclosure of qualitative and quantitative targets to monitor strategic goals, and any targets an entity is required to meet by law or regulation, including any GHG emissions targets. For each target, disclosure is required for the metrics used to set the targets and the objectives of the targets.</p> <p>Part or all of the entity that the targets apply to, and the applicable time period; Base period against which progress is measured and any milestones or interim targets. Where the target is qualitative, identify if it is an absolute or intensity based target;</p> <p>Identify the entity's process in setting and reviewing each target, and how it monitors progress against each target; disclose information about its performance against each climate-related target and an analysis of trends or changes in the entity's performance; For each GHG target, disclose which greenhouse gases are covered by the target, and whether the GHG emissions target covers Scope 1,2 or 3. The entity must disclose both gross and net GHG targets; whether the target was derived using a sectoral decarbonisation approach (a Science Based Target initiative).</p> <p>The planned use of carbon credits to offset GHG emissions, including how achieving the GHG targets relies on the use of carbon credits; which third parties will verify the carbon credits; the type of carbon credits - nature-based or based on technological carbon removals; and whether the underlying offset is achieved through carbon offset or removal, as well as any other relevant factors.</p>

3. Regulation Overview

Regulation Overview	Climate & Reporting	What is it about?	Measuring/Transition Benchmark Pathways/Target Setting	Target financial institutions	Exempt from reporting
<p><u>Corporate Sustainability Reporting Directive (CSRD); from Jan. 2024</u></p>	<p><u>ESRS E1 Climate Change (reference document = DRAFT EUROPEAN SUSTAINABILITY REPORTING STANDARDS (EFRAG)</u></p>	<p>The standard describes disclosure requirements related to Climate Change (see page 6. Objectives) and takes into account the requirements of EU-related legislation & regulation (EU Climate law, Climate Benchmark standard regulation. SFDR, EU Taxonomy, EBA Pillar 3 disclosure requirements).</p>	<p>Measuring Sub-Standards E1-6 Gross Scope 1,2,3 and total GHG emissions: Scope 1,2& 3 stemming from own operations and Scope 3 (cl 15) financed GHG emission.</p> <p>Targeting Sub-Standard E1-4: Targets related to climate change mitigation and adaptation (32.a disclose in absolute value and if deemed in intensity value; 32.d include targets at least for 2030 and if available for 2050).</p>	<p>Banks; Insurance; Asset Manager</p>	<p>Institutions with less than 750 employees are exempted from reporting Scope 3 emissions for the first reporting year.</p>

Regulation Overview	Climate & Reporting	What is it about?	Measuring/Transition Benchmark Pathways/Target Setting	Target financial institutions	Exempt from reporting
<p>Sustainable Finance Disclosure Regulation (SFDR);</p> <p>Incl. Guidance: ESA Joint Consultation Paper: Review of SFDR Delegated Regulation regarding PAI and financial product disclosure JC 2023 09 (12 April 2023)</p>	<p>Principal Adverse impacts (climate-related)</p> <p>How to lay out environmental characteristics and/or environmental objectives of certain financial products</p>	<p>The SFDR requires financial market participants and financial advisers to inform investors about how they consider the sustainability risks that can affect the value of and return on their investments ('outside-in' effect) and the adverse impacts that such investments have on the environment and society ('inside-out').</p>	<p>Measuring Absolute Scope 1,2 & 3; Carbon footprint; GHG intensity; non-renewable energy consumption and production; energy consumption intensity per high impact sector</p> <p>Transition Benchmark Pathways Transition Benchmarks can inform engagement strategies. Relevant if climate objective of a fin. product will be achieved through investments that lead to reductions over the time by engaging with investee companies to reduce their emissions. (ESA JC 2023 09)</p> <p>Targeting For Art. 9 products, alignment of the climate mitigation target of product with 1.5°C scenario (ESA JC 2023 09). Target setting to determine climate objective. Most common approach for climate targets is based on GHG accounting methodologies. Climate targets may also be stated by other capacity-based approaches (e.g., forward looking production plans).</p>	<p>Banks; Asset Manager; Insurance</p>	<p>Financial advisors with less than 3 employees; insurance intermediaries which provide insurance advice with regard to IBIPs.</p>

Regulation Overview	Climate & Reporting	What is it about?	Measuring/Transition Benchmark Pathways/Target Setting	Target financial institutions	Exempt from reporting
EU Taxonomy	<p><u>Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives (Text with EEA relevance)</u></p>	<p>The EU Taxonomy is a green classification system that translates the EU’s climate and environmental objectives into criteria for specific economic activities for investment purposes. It recognises as green, or ‘environmentally sustainable’, economic activities that make a substantial contribution to at least one of the EU’s climate and environmental objectives, while at the same time not significantly harming any of these objectives and meeting minimum social safeguards.</p>	<p>Measuring The EU Taxonomy measures the environmental sustainability of economic activities based on their contribution to six environmental objectives:</p> <ul style="list-style-type: none"> Climate Change Mitigation Climate Change Adaptation Sustainable Use and Protection of Water and Marine Resources Transition to a Circular Economy Pollution Prevention and Control Protection and Restoration of Biodiversity and Ecosystems. 	<p>Banks; Insurance; Asset Manager; Investors</p>	

Regulation Overview	Climate & Reporting	What is it about?	Measuring/Transition Benchmark Pathways/Target Setting	Target financial institutions	Exempt from reporting
<u>Own Risk and Solvency Assessment (ORSA)</u>	EIOPA opinion on the supervision of the use of climate change risk scenarios in ORSA (EIOPABoS-21-127). EIOPA application guidance on how to reflect climate change in ORSA. This document provides operational clarification on how to apply the EIOPA opinion.	Climate risks in relation to ORSA involve assessing the potential financial impacts of climate-related factors on an insurance company's solvency and overall risk profile. This process helps insurers identify and manage the risks associated with climate change, ensuring they have adequate capital to cover potential losses and make informed strategic decisions.	Targeting The objective will be to integrate the analysis of the impacts of climate change on the business and, for relevant companies based on their exposure level, to conduct specific stress tests within the framework of prospective ORSA studies. It should be noted that the long-term prospective analyses requested for this exercise may require potential efforts to be allocated to actuarial projection models (calibrations, input data, etc.) and related technical expertise.	Insurance	
<u>Luxembourg CSSF Circular 21/773</u>	On the Management of Climate-related and Environmental Risks	Describes how the CSSF expects credit institutions to consider and integrate into their operations climate-related and environmental risks, as drivers of existing categories of risks.		Banks	Credit institutions when formulating and implementing their business strategy, governance and risk management frameworks.

V. Case study

This annex reflects the case study of a financial institution applying PCAF, TPI and PACTA in presenting different templates of the EBA Pillar 3 ESG Disclosures.

Template 1: Banking book - Climate Change transition risk: Credit quality of exposures by sector, emissions and residual maturity

A) Description of Template 1

This template, which is part of the EBA Pillar 3 Disclosures on ESG risks, reports, among others, the financial institution's

- Gross-Carrying amounts (Balance sheet exposures)
- Financed GHG emissions broken down by climate relevant sectors (code Nace A to H and L) in the financial institution's Banking book. GHG emissions have to be reported under Columns (i) and (j). PCAF framework typically should apply in guiding the financial institution in defining and /or calculating the financed GHG emissions.

Illustration on how PCAF can help Financial Institutions to calculate their financed GHG emissions is illustrated on page 40 and page 41 illustrates the completion of the required information in template 1.

B) Example of applying PCAF to different asset classes

EBA Pillar 3 - Template 1	Assets Class	Corporate Bond		Corporate Bond		Business Loans
	Code NACE	B.06		D35.11		C10.11
	Gross Carrying Amount in FI's B/S	5.000.000,00	5.000.000,00	15.000.000,00	5.000.000,00	5.000.000,00
	PCAF Data Quality Score	2	4	2	2	5
	Company Name	Shell	SINOPEC	EDF	ENGIE	Company A
	EVIC (MSCI) in mio €	229.798,65		114.627,40	81297,5	
	Total Equity + Debt (Bloomberg)		230.755,00			
	Company Revenue in mio €		384.750,42			
		2.599,55				

Sector Revenue in mio €					
GHG Scope 1 (MSCI) in t CO2	91.000.000,00	92.941.869,00	27.000.000,00	37.528.756,00	26,09
GHG Scope 2 (MSCI) in t CO2	9.000.000,00	30.025.457,00	290.000,00	1.922.614,00	0,49
GHG Scope 3 (MSCI) in t CO2	1.299.000.000,00	9.868.957,22	102.000.000,00	126.904.619,00	1.719,12
Financed emissions-PCAF algorithm	$\sum_c \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{company emissions}_c$ <p>For listed companies:</p> $\sum_c \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{company emissions}_c$ <p>For bonds to private companies:</p> $\sum_c \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c} \times \text{company emissions}_c$	$\sum_c \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{Revenue}_c \times \frac{\text{GHG emissions}_c}{\text{Revenue}_c}$ <p>For listed companies:</p> $\sum_c \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{Revenue}_c \times \frac{\text{GHG emissions}_c}{\text{Revenue}_c}$ <p>For bonds to private companies:</p> $\sum_c \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c} \times \text{Revenue}_c \times \frac{\text{GHG emissions}_c}{\text{Revenue}_c}$	$\sum_c \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{company emissions}_c$ <p>For listed companies:</p> $\sum_c \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{company emissions}_c$ <p>For bonds to private companies:</p> $\sum_c \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c} \times \text{company emissions}_c$	$\sum_c \text{Outstanding amount}_c \times \text{Asset turnover ratio}_c \times \frac{\text{GHG emissions}_c}{\text{Revenue}_c}$	
Financed emissions in absolute (Scope 1) in t CO2	1.979,99	2.013,86	3.533,19	2.308,11	155,45
Financed emissions in absolute (Scope 2) in t CO2	195,82	650,59	37,95	118,25	2,93
Financed emissions in absolute (Scope 3) in t CO2	28.263,87	31.649,81	13.347,59	7.804,95	10.241,23
Financed emissions in absolute (Scope 123) in t CO2	30.439,69	34.314,26	16.918,73	10.231,31	10.399,61

PCAF formulas to assess financed emissions – this ensures comparability between FIs

Remarks:

- **Data Quality Score:** Depending on the data availability, PCAF assigns a Data Quality Score ranging from 1 (verified) to 5 (uncertain) giving the stakeholders an indication if the Bank either uses proxies (score 5) to estimate its financed GHG emissions or either relies on reliable / verified GHG emissions to establish its carbon footprint. (PCAF (2022) => The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second Edition.)
- **EVIC:** Based of the type of the company, the denominator in the formula changes. So for all listed companies, this is the enterprise value including cash (EVIC) of the respective company. Only for traded bonds to private companies is this the sum of total company equity and debt.
- **PCAF Database:** As we don't have any Data for our SME clients, we relied on the PCAF Database for Luxembourg, which gives us proxies to be able to establish the financed emissions of our business loans portfolio. This equals to a data quality score of 5, meaning that PCAF gives us a proxy for the emissions factors (Asset turnover ratio *(GHG emissions / Revenue)).

C) Integration of PCAF data into the template 1

We only focus on datafields of EBA pillar III ESG template 1 that are related to carbon emissions. The original format of the template is shown on the next page.

Relevant Datafields	Value		
	B.06 - Extraction of crude petroleum and natural gas	D35.1 - Electric power generation, transmission and distribution	C.10 - Manufacture of food products
Gross Carrying amount	10.000.000,00	20.000.000,00	5.000.000,00
GHG financed emissions (scope 1, scope 2 and scope 3 emissions of the counterparty in tons of CO2 equivalent)	64.753,96	27.150,04	10.399,61
Of which Scope 3 financed emissions	59.913,68	21.152,55	10.241,23

PCAF is used to derive emissions where no data is available, and for formulas to compute GHG financed emissions

Template 2: Banking book - Climate change transition risk: Loans collateralized by immovable property - Energy efficiency of the collateral

A. Description of the template

Prudential information on climate change transition risk faced by loans collateralized with commercial and residential real estate properties, and on collateral repossessed, must be based on the energy efficiency of the collateral. Template 2 includes information on the distribution of real estate loans and advances and of repossessed collateral, by energy consumption and by EPC label of the collateral.

This template includes in the columns information on the gross carrying amount of loans collateralized with immovable property and of repossessed real estate collateral with a breakdown by EPC label of the collateral. When disclosing the EPC distribution of the collateral, institutions must disclose separately those exposures for which they do not have the EPC information of the collateral.

B. Example of applying PCAF framework tool

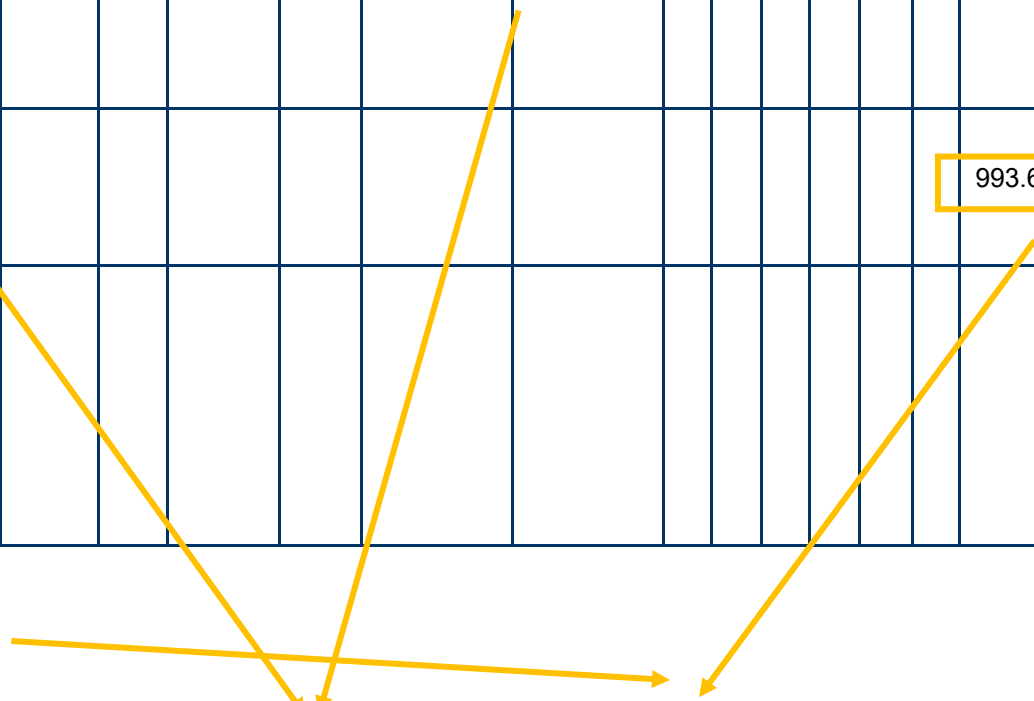
This example showcases how we apply PCAF Framework on Template 2 (Loans collateralized by immovable property) from EBA Pillar 3 ESG reporting.

The template distinguishes between Loans where the Energy Performance Certificate is available to the bank (**Data quality score 1 according to PCAF**) and Loans where there is no EPC available and where estimation has to occur (**Data quality score 4 according to PCAF**).

	EPC available	Energy Class Collateral	Surface of collateralised property available	Data quality Score	Level of energy efficiency (Kwh / m2)	Gross-Carrying amount
Loan 1	Yes	B	Yes	1	51,2	176.707,85€
Loan 2	Yes	A	Yes	1	16,5	156.837,22€
Loan 3	No	Estimated (B)	Yes	4	Estimated - 110,536	31.675,43€
Loan 4	No	Estimated (A)	Yes	4	Estimated - 67,958	961.991,15€

C. Integration of data into the template

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
	Counterparty sector	Total gross carrying amount (in MEUR)															
		Level of energy efficiency (EP score in kWh/m ² of collateral)						Level of energy efficiency (EPC label of collateral)							Without EPC label of collateral		
		0; <= 100	> 100; <= 200	> 200; <= 300	> 300; <= 400	> 400; <= 500	> 500	A	B	C	D	E	F	G	Of which level of energy efficiency (EP score in kWh/m ² of collateral) estimated		
1	Total EU area	333.545,07€						156.837,22€	176.707,85€								
2	Of which Loans collateralised by commercial immovable property																
3	Of which Loans collateralised by residential immovable property																993.666,58€
4	Of which Collateral obtained by taking possession: residential and commercial immovable properties																



5	Of which Level of energy efficiency (EP score in kWh/m ² of collateral) estimated			961.991,15€	31.675,43€														
6	Total non-EU area																		
7	Of which Loans collateralised by commercial immovable property																		
8	Of which Loans collateralised by residential immovable property																		
9	Of which Collateral obtained by taking possession: residential and commercial immovable properties																		
10	Of which Level of energy efficiency (EP score in kWh/m ² of collateral) estimated																		

Explications:

- Colonne h-n : If the EPC is available, sum-up gross carrying amount of loans in portfolio by energy class based on the data retrieved from EPC certificate.

- Colonne b-g : Where EPC on Collateral is available, break down gross carrying amount depending on kwh/m2 ranges.
- Colonne p : Gross carrying amount where no EPC (certificate) is available.

Template 3: Banking Book - Indicators of potential climate change transition risk: Alignment metrics

A) Description of the template:

Institutions shall disclose in this template information on their alignment efforts with the objectives of the Paris Agreement for a selected number of sectors (the mandatory minimum set of sectors includes Power, Fossil fuel combustion, Automotive, Aviation, Maritime transport, Cement clinker and lime production, Iron and steel, coke and metal ire production, Chemicals).

The disclosures on the alignment shall capture **the extent to which financial flows are consistent with a pathway towards low greenhouse gas emissions and climate-resilient development as referred in the Paris Agreement**. The economic scenario that describes that decarbonization pathway is the **International Energy Agency (IEA) Net Zero Emissions by 2050 Scenario (NZE2050)**. Institutions shall take into account that scenario.

Institutions are to disclose several metrics for each sector that is relevant to their financing activity. These are to cover **emission intensity metrics, technology mix-based metrics and production-based metrics**.

Example of emissions intensity using TPI shown on page 46 and 47.
 Example of technology mix-based metrics using PACTA shown on page 47 and 48.

Does this mean that both TPI (for emissions intensity) and PACTA (technology mix-based metrics) would be needed for reporting?

B. Example on sectoral emission intensities retrieved from the TPI tool

We defined for our calculation example a portfolio containing exposures on two "Power Generation" companies and we retrieved the respective emission intensities from the TPI ("transition Pathway initiative") data base.

Dataset	Emission Intensity DATA			Gross Carrying amount 2022 in the Bank's portfolio (EUR)
	2022	2025	2030	
Benchmark scenario 1.5 Degrees (IEA) - g CO2e / kwh Power sector	0,26	0,19	0,06	
ENGIE 1.5 Degrees targeted pathway	0,17	0,15	0,11	5.000.000

EDF 1.5 Degrees targeted pathway	0,05	0,05	0,05	15.000.000
Portfolio Average weighted Carbon intensity	0,08	0,075	0,065	

in 2030, benchmark portfolio would have 0.06 gCO₂e/kWh, our portfolio has 0.065 gCO₂e/kWh
 → distance to IEA 1.5 scenario is of 7.7% (1 - 0.06/0.065)

C. Example on sectoral emission intensities retrieved from the TPI tool

We focus on main data fields of EBA pillar III ESG template 3 in order to be comprehensive. The original template is shown in the appendix.

Explanation of value computed for Portfolio Average weighted Carbon intensity in target year 2025

Relevant Datafield	Value	Explanation
Sector	Power	
Portfolio gross carrying amount (mn eur)	20.000.000	= 5.000.000 + 15.000.000
Alignment metric - 1,5 C IEA NZE2050	g CO ₂ e / Kwh	The sectoral physical carbon intensity
Alignment value 2022 (average)	0,08	= (5.000.000 x 0,17 + 15.000.000 x 0,05) / 20.000.000
Year of reference	2022	In this example we consider the year of reference to be 2022
Distance to IEA NZE2050 in %	33%	Formula : (Average metric at reference year - IEA scenario metric in 2030) / IEA scenario metric in 2030.
Target (year of reference + 3 = 2025)	0,075	This is the targeted average metric in 2025

D. Example on technology mix-based metrics retrieved from PACTA tool (Average share of high carbon technologies (oil, gas, coal))

We defined for our calculation example a portfolio containing exposures on two "Power Generation" companies and we retrieved the mix-based metrics from the **PACTA** reporting. The following table shows the split between technologies in the power sector expected within the portfolio in 5 years. It assumes no changes in portfolio allocation over time.

	Portfolio - power sector	Future Technology Mix - 2027		
		Bank portfolio	Aligned portfolio	Alignment Gap
	Benchmark scenario 1.5 Degrees (IEA) - NZE 2050			
Low Carbon Technologies	Renewables	22,20%	40,20%	-18,00%
	Hydropower	14%	12,30%	1,70%

bank portfolio would need to significantly increase share of renewables

	Nuclear Power	49,90%	38%	11,90%
Total LC		86,10%	91%	-4,40%
High Carbon Technologies	Gas Power	9,90%	6,70%	3,20%
	Oil Power	2%	1,10%	1,10%
	Coal Power	1,80%	1,70%	0,10%
Total HC		13,90%	9,50%	4,40%
		100,00%	100,00%	0,00%

and to decrease share in Gas Power

C. Integration of data into the template

We focus on main datafields of EBA pillar III ESG template 3 in order to be comprehensive.

Relevant Datafield	Value	Explanation
Sector	Power Generation	
Portfolio gross carrying amount (mn eur)	20.000.000	= 5.000.000 + 15.000.000
Average share of high carbon technology	13,9%	See table on page 10
Alignment value 2027	9,5%	
Year of reference	2022	In this example we consider the year of reference to be 2022
Distance to IEA NZE2050 in %	4,4%	Distance between Bank portfolio mix in 2027 and Aligned portfolio mix in 2027
Target (year of reference + 3 = 2025)	Not available	This is the targeted average metric in 2025

VI. Bibliography

- ACT Finance <https://actinitiative.org/act-methodologies/>
- Assessing Low Carbon Transition (ACT): <https://actinitiative.org>
- Financial sector science-based targets guidance: <https://sciencebasedtargets.org/resources/files/Financial-Sector-Science-Based-Targets-Guidance.pdf>
- Glasgow Financial Alliance for Net Zero (GFANZ) - <https://www.gfanzero.com/membership/>
- Green Finance Alliance: <https://www.bmk.gv.at/en/green-finance/alliance/about-us.html>
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- Paris Agreement Capital Transition Assessment (PACTA): <https://2degrees-investing.org/resource/pacta/>
- Paris Agreement Capital Transition Assessment (PACTA): <https://pacta.rmi.org/>
- Partnership for Carbon Accounting Financials (PCAF): <https://carbonaccountingfinancials.com/en/>
- Partnership for Carbon Accounting Financials (PCAF): <https://carbonaccountingfinancials.com>
- Science-Based Target Initiative (SBTi): <https://sciencebasedtargets.org>
- Science-Based Targets: <https://sciencebasedtargets.org>
- Swiss Climate Scores: <https://www.sif.admin.ch/sif/en/home/swiss-climate-scores/brief-summary.html>
- Task Force on Climate-related Financial Disclosures (TCFD) - <https://www.fsb-tcf.org>
- The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second Edition. <https://carbonaccountingfinancials.com/standard>
- The Intergovernmental Panel on Climate Change (IPCC) - AR6 Synthesis Report: <https://www.ipcc.ch/report/ar6/syr/resources/spm-headline-statements>
- The Intergovernmental Panel on Climate Change (IPCC) – AR6 Synthesis Report figure 4: https://www.ipcc.ch/report/ar6/syr/downloads/figures/IPCC_AR6_SYR_Figure_4_4.png
- The Intergovernmental Panel on Climate Change (IPCC) – Glossary: <https://www.ipcc.ch/sr15/chapter/glossary/>
- TPI Sectoral Decarbonisation Pathways: <https://www.transitionpathwayinitiative.org/publications/2022-tpi-sectoral-decarbonisation-pathways.pdf?type=Publication>
- Transition Pathway Initiative (TPI): <https://www.transitionpathwayinitiative.org>
- United Nations – Climate Action: <https://www.un.org/en/climatechange/net-zero-coalition>