Green and Sustainable
Finance Cluster
Germany

Lending to a climate neutral Germany by 2045

Discussion paper: steering loan portfolios in line with the Paris climate goals

Net Zero Banking Alliance Germany

July 2021

Green and Sustainable
Finance Cluster
Germany

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Foreword

It has been three years since the Green and Sustainable Finance Cluster Germany ("the Cluster") was founded, and today there is less need to raise awareness of green and sustainable finance in the German marketplace. Financial institutions increasingly recognise the societal, regulatory and physical pressure to act and embrace the opportunities for their businesses and society. The mission of the Cluster is to connect market actors to facilitate a more efficient and effective transformation to a sustainable financial system remains relevant given these developments. Today, the Cluster is a platform for implementing concrete measures in the marketplace and for discussing the solutions to the challenges of tomorrow.

The financial industry is working on integrating sustainable finance in their daily business, since a strong operational framework is a prerequisite for fulfilling sustainability-related commitments. Although frequent announcements of new products and market growth indicate that progress is being made, the portfolios of most financial institutions are not yet aligned with sustainability goals. Operational challenges persist, including those related to frameworks and methods, market harmonisation, access to data, skills development, and the interaction between the financial system and the real economy.

The Cluster is delighted to host the Net Zero Banking Alliance Germany (NZBAG), a platform of seven banks collaborating on a pre-competitive basis to tackle the challenges of implementing climate commitments. The NZBAG has begun to push the methodological frontier and harmonise market approaches. The technical and operational nature of the NZBAG is a perfect fit with the Cluster's portfolio of industry-supporting initiatives.

Just five months after kick-off, the NZBAG is ready to contribute to public discussions and seek input from interested stakeholders. The pace and intensity of the work demonstrate that the German banking sector is preparing to be fit for Paris. Recent announcements of ambitious climate targets are signs of progress, not only at the sectoral level, but also within individual banks.

This discussion paper aims to support the harmonisation of climate action in the German banking sector. It maps out important elements to chart a clear way forward. While the NZBAG seeks greater interdisciplinary exchange with experts, many challenges remain. The Cluster's managing directors are committed to supporting this journey wherever possible so that the next three years will be at least as fruitful for sustainable finance in the German marketplace as the last three years.

The Cluster invites all interested stakeholders to join the discussion.

Yours sincerely,

Kristina Jeromin
Managing Director of the Cluster

Karsten Löffler
Managing Director of the Cluster

BNP PARIBAS

COMMERZBANK

Deutsche Bank

DKB
Das kann Bank

DZ BANK
Bank on Germany

ING
Die Bank und Du

LBBW

Participating institutions
Net Zero Banking Alliance Germany

Executive summary

The German banking sector has been committed to meeting the Paris climate goals since the voluntary climate commitment was signed in June 2020.[1] This collective action set the stage for pre-competitive collaboration in the financial sector to tackle the challenges of translating commitments into concrete action. In February 2021, the Net Zero Banking Alliance Germany (NZBAG) was founded and commenced work. This discussion paper aims to open a dialogue with interested stakeholders on the NZBAG's efforts to align loan portfolios with the Paris climate goals.

Steering Paris-aligned loan portfolios involves translating macro climate targets into the micro decisions of daily business, especially the credit process. This requires banks to measure the climate performance of their portfolios, set targets for their portfolios, develop a Paris-aligned product portfolio, and initiate active dialogue with clients.

A loan portfolio with a solid climate performance has three main characteristics:

- **Alignment with the climate transition pathway**[2]: loan portfolios converge with the climate transition pathway of the loan portfolio.
- **Positive impact:** lending activities can make an important contribution to climate change mitigation by allocating capital to transformational economic activities in high-impact sectors. The NZBAG suggests using the EU Taxonomy to measure positive impacts.
- **Sustainable and climate neutral growth:** the loan portfolio continues to grow and banks benefit from climate action through new financing opportunities and a competitive advantage.

The first five months of the NZBAG's work has been focused on measuring the climate performance of loan portfolios. The NZBAG has discussed the preconditions and decisions required to steer loan portfolios effectively. Three aspects stand out:

- **Portfolio steering model:** banks can choose between different models of portfolio steering, including carbon budgets, technology pathways, temperature scores, and shadow pricing. The NZBAG primarily recommends carbon budgets and technology pathways as steering models since these are used most, are most closely related to climate science, and are most useful in discussing decarbonisation strategies with the real economy[3].

1 See: Global Warming Potentials (IPCC Fourth Assessment Report: https://unfccc.int/process-and-meetings/transparency-and-reporting/greenhouse-gas-data/frequently-asked-questions/global-warming-potentials-ipcc-fourth-assessment-report.

2 Climate transition pathway refers to the decarbonisation process of the economy required to achieve the Paris climate goals.

3 Real economy refers to all non-financial parts of the economy.

- **Choice of climate scenario:** the choice of climate scenario affects the transition pathway of the loan portfolio. The NZBAG suggests minimum requirements for climate scenarios and makes a first attempt at narrowing the possible range of scenarios. Later work might focus on defining a single benchmark scenario.
- **Single climate metric for portfolios:** The NZBAG suggests the Climate Action Portfolio Indicator (CAPI) as a single portfolio metric in this context. A bottom-up analysis can capture the unique characteristics of the sector and the banking business model. The 1.5°C target of the Paris Agreement guides the climate transition pathway.

This discussion paper provides a glimpse into the work of the NZBAG. Until the end of 2022, the NZBAG will more closely reflect the operational realities of the German banking sector. Please consider this paper as an invitation to join the discussion.

The Net Zero Banking Alliance Germany

Climate action is increasingly recognised as a key development in the German banking sector. In 2020, 16 banks operating in Germany signed a voluntary commitment to meet the goals of the Paris Agreement[4]. This collective action set the stage to methodically implement the banking sector's climate ambitions for the end of 2022. The signatories aim to develop methodologies, targets, and implementation processes that will transform and enable their portfolios to align with the goals of the Paris Agreement and achieve net zero emissions by 2050 at the latest.

The Net Zero Banking Alliance Germany (NZBAG) supports the German banking sector in the pre-competitive implementation of the voluntary climate commitment. Under the NZBAG, currently seven banks are collaborating to harmonise their efforts and ensure a science-based approach. The secretariat of the NZBAG is hosted by the Green and Sustainable Finance Cluster Germany e.V. ("the Cluster").

Institutions participating in the NZBAG will jointly develop a methodology to measure the climate impact of their credit portfolios and manage them in line with national and international climate targets. In this way, the NZBAG will help to achieve the banking sector's ambitions for climate mitigation. These ambitions are defined in line with the Paris Agreement goals: that global warming will be limited to well below 2°C and, if possible, to 1.5°C.[5] The targets must be science-based and transparent.

The NZBAG will cover at least the following areas of work until the end of 2022:

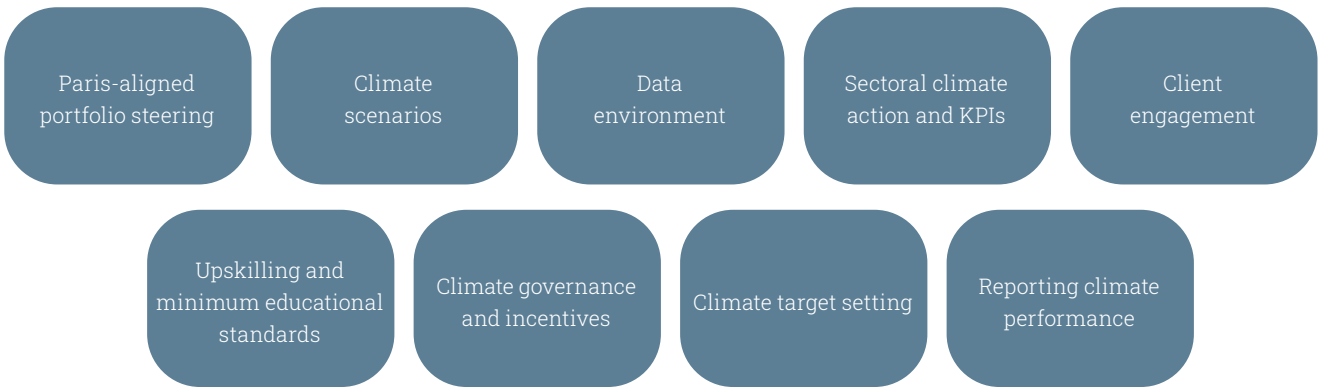


Figure 1: The NZBAG's areas of work **Source:** NZBAG

4 The Paris Agreement is a legally binding international treaty on climate change adopted at COP 21 in Paris on 12 December 2015 and entered into force on 4 November 2016. See: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement.

5 As climate action is increasingly targeting 1.5°C, the working assumption of the NZBAG is to develop a framework to implement this goal.

The NZBAG is collaborating with Pathways to Paris (PtP). This project of the World Wide Fund for Nature (WWF) Germany and PricewaterhouseCoopers Germany (PwC) primarily covers climate action and KPIs, with a focus on developing decarbonisation pathways for ten high-impact sectors. Close cooperation between the PtP and the NZBAG has forged a link between banks and companies outside the financial sector. The NZBAG is open to other collaborations of this kind.

The voluntary climate commitment of the German financial sector

The NZBAG is an initiative by seven banks to implement the voluntary climate commitment signed by 16 banks operating in Germany in June 2020.[6]

The signatories aim to align their loan and investment portfolios[7] with the goals of the Paris Agreement and achieve net zero emissions by 2050. This means limiting global warming to well below 2°C and aiming for a target of 1.5°C. In line with the amendment to the Climate Change Act, German loan portfolios should reach climate neutrality by 2045. Interim targets of the government also apply.

Signatories will communicate sector-specific climate targets by the end of 2022 in line with certain climate scenarios. The focus will be on high-impact sectors such as transport and logistics, electricity generation, or manufacture of steel.

The voluntary climate commitment represents a collaborative effort to collect data and develop methodologies and approaches to manage business activities in line with the Paris climate goals. The NZBAG is a pre-competitive platform that was convened for this purpose. Banks will report on their progress and targets annually.

6 See: Klimaschutz-Selbstverpflichtung des deutschen Finanzsektors / Collective Commitment. https://cdn.website-editor.net/8475c96237754ffc80b1a6b6961f9bcb/files/uploaded/German%2520collective%2520commitment%2520to%2520climate%2520action%2520of%2520finacial%2520sector.pdf

7 The agreement only applies to investment portfolios that are not the object of fund or mandate business. See: https://cdn.website-editor.net/8475c96237754ffc80b1a6b6961f9bcb/files/uploaded/German%2520collective%2520commitment%2520to%2520climate%2520action%2520of%2520finacial%2520sector.pdf.

1. Aligning loan portfolio steering with the Paris Agreement

- Banks have a vital role to play in the climate transformation[8] of the real economy.
- Financing activities should support positive climate impacts and become aligned with the Paris climate goals.
- Paris-aligned portfolio steering requires banks to harmonise high-level climate targets and decisions throughout the credit process.

Banks have a vital role to play in the climate transformation of Germany's real economy. As a key provider of capital to large, medium-sized and small enterprises, the banking sector is connected to every part of the German economy. Transforming the economy will mean aligning loan portfolios with the 1.5°C target and vice versa. Key milestones in the transformation will include at least a 55 per cent reduction in greenhouse gas (GHG) emissions by 2030 compared to 1990 levels in Europe, achieving a climate-neutral German economy by 2045, and climate neutrality globally by 2050.

Integrating climate action in loan portfolio steering

The German banking sector is committed to climate action. The voluntary climate commitment by the financial sector sets the ambition level for climate action.[9] Banks are aiming to accelerate climate transformation, strengthen the global economy, and minimise the risks of not taking climate action or pursuing it too late. This requires a harmonised approach to steering climate-related loan portfolios.

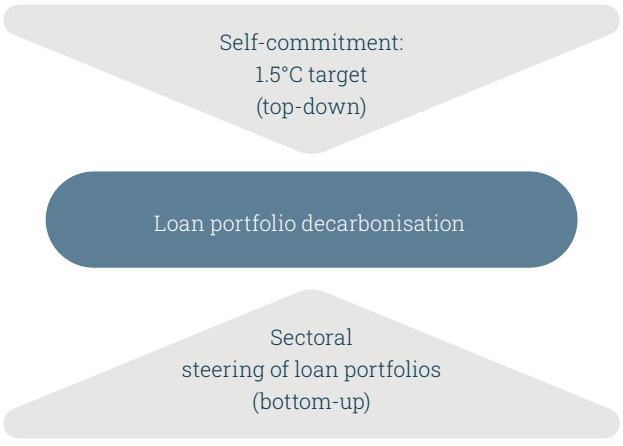


Figure 2: A strategic view of decarbonising loan portfolios **Source:** NZBAG

8 Climate transformation refers to the structural change of the global economy and society to mitigate climate change and adapt to its consequences.

9 For further information, see (German only): https://www.klima-selbstverpflichtung-finanzsektor.de/.

The decarbonisation of loan portfolios requires a strategic approach and bottom-up implementation (see Figure 2). The financial sector's voluntary climate commitment was a strategic decision to actively shape the loan portfolios of banks operating in Germany. Therefore, these commitments need to be systematically integrated in the banks' target setting, portfolio steering, market and risk operations, product development, and governance structure. Banks will need to measure compliance with the voluntary climate commitment in their portfolios under a particular climate scenario. Paris alignment will only be possible if banks integrate climate aspects in credit decisions. Therefore, the real climate impact of decarbonising loan portfolios will happen from the bottom-up and close to the real economy.

Steering loan portfolios to align with the Paris climate goals has three dimensions:

1. **Striving for a positive impact on climate transformation:** banks can play an active role in supporting the climate transformation by financing economic activities that have a positive impact. Activities with a positive impact contribute substantially to the climate transformation of the global economy. For instance, banks could increasingly lend to renewable energy projects. Banks should aim to maximise financing for these activities while at the same time not underestimating the risk of "green" activities[10].
2. **By increasing the volume and number of Paris-aligned activities in the loan portfolio:** with today's technology, it is possible for Germany to comply with interim climate goals in line with the Paris Agreement.[11] Banks should strive to support this transition by maximising financing for activities that are on a Paris-compatible path and engaging with clients to align their business activities with this path. For instance, banks could communicate with farmers to start a transition process to a more plant-based revenue model.
3. **Minimising exposure of the portfolio to Paris-incompatible activities:** current loan portfolios include a significant share of economic activities that are not aligned with Paris-compatible climate transition pathways. Banks should aim to minimise exposure to those activities by excluding incompatible sectors (e.g. coal mining), engaging with clients on climate issues and, ultimately, rejecting loan applications.

The decarbonisation of loan portfolios is a steady but ambitious process. Banks should begin this process today to avoid disruptions on the path to climate neutrality. Early and ambitious portfolio decarbonisation will most likely result in better economic outcomes. Figure 3 highlights key milestones, from phasing out Paris-incompatible activities to increasing positive impacts, to achieving climate neutrality.

10 Recently, discussions on a "green bubble" arose as capital providers increasingly seek green investments while green investment opportunities remain limited. As a result, capital costs might not reflect risks in green assets anymore in some cases.

11 See the IEA NZE2050 Scenario: Net Zero by 2050 – Analysis (https://www.iea.org/reports/net-zero-by-2050?utm_campaign=IEA%20newsletters&utm_source=SendGrid&utm_medium=Email)

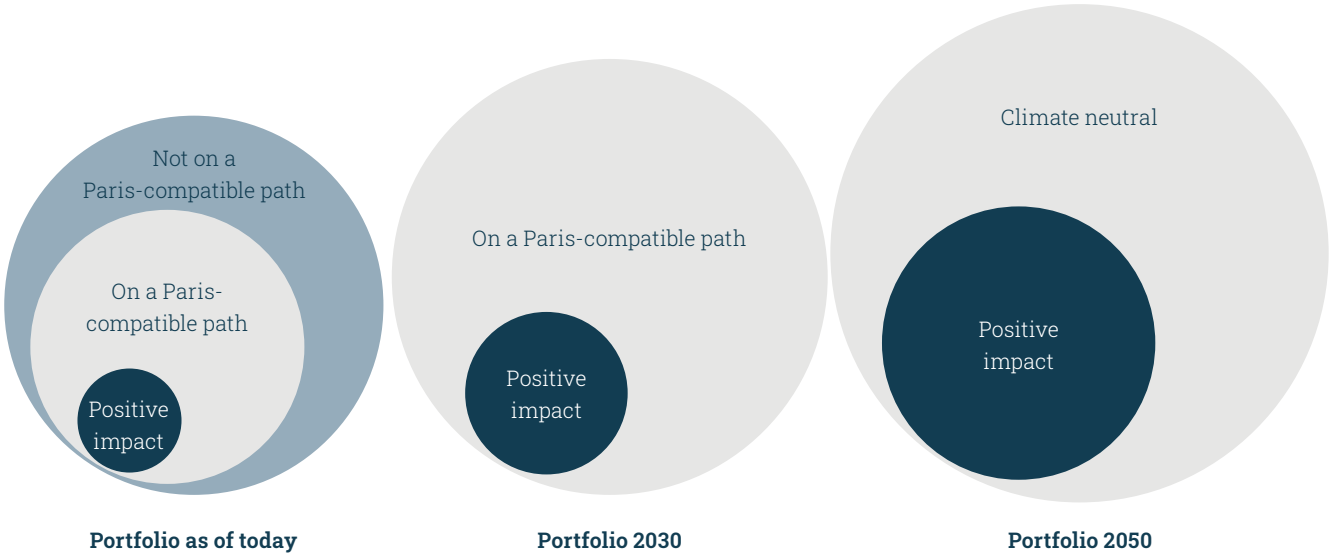


Figure 3: Paris-aligned loan portfolio development to 2050 (schematic) **Source:** NZBAG

The climate transformation is a business opportunity for banks. Positioning themselves as partners in the climate transformation and as thought leaders in decarbonising high-impact industries will ultimately help banks to expand their loan portfolios and retain their social licence to operate. As competitors are beginning to realise the opportunity, the climate transformation will increasingly become a competitive factor. Early movers will most likely reap a large share of the benefit.

A conceptual approach to matching the banking business with climate action

The decarbonisation of loan portfolios is challenging. Many unanswered questions remain on how to translate climate commitments into tangible action. For most actors in the real economy, and for many financial institutions, the long-term horizon for action goes beyond the business cycle. This means banks will need to find ways to conduct analyses beyond loan terms and consider the economic lifetime of the assets being financed. This is particularly relevant in the context of the revolving nature of many business-bank relationships. The banking sector also needs to find solutions to deal with long-term financing instruments and its underlying assets that run beyond 2045 and are not in line with the decarbonisation pathway.

The NZBAG aims to tackle these challenges by developing an impactful, science-based, practical, accessible operating framework for banks that increases accountability. A framework helps to put challenges into perspective and enable NZBAG members to work on joint solutions in a structured manner. It also unites the high-level targets of the sector's voluntary climate commitment with the overall outlook of loan portfolios and day-to-day decision-making (see Figure 4).

The circular design of the framework illustrates that improving the climate performance of loan portfolios is an iterative process.

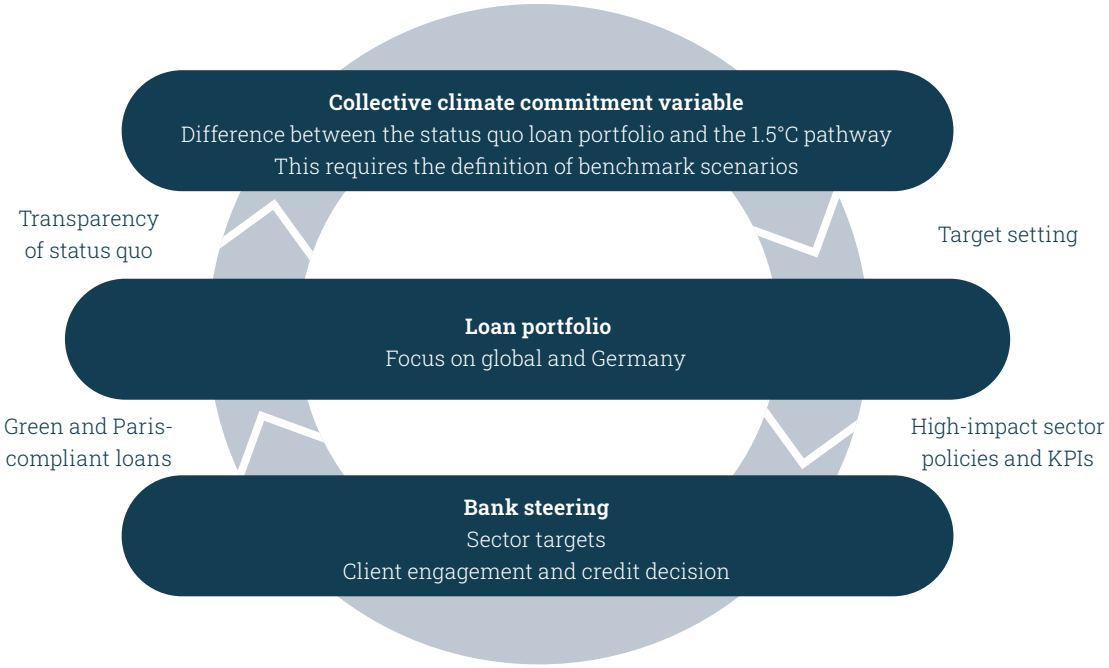


Figure 4: A conceptual framework to unite top-down and bottom-up approaches **Source:** NZBAG

Key concepts and challenges within the framework are:

- **Transparency of the status quo:** banks need to understand the climate impact of their loan portfolios.[12] There are different approaches to measuring the status quo. Chapter 2 includes a short discussion of options and the NZBAG's chosen approach. Since the NZBAG is a methodologically agnostic initiative, it does not recommend a specific method for measuring the status quo. The NZBAG welcomes a project by the Verein für Umweltmanagement und Nachhaltigkeit in Finanzinstituten (VfU) to help banks use the Partnership for Carbon Accounting Financials (PCAF) approach.[13] The PCAF appears to be the gold standard for carbon accounting in loan portfolios.[14]
- **Calculating the change from a status quo loan portfolio to a 1.5C pathway:** understanding the gap between a status quo loan portfolio and a portfolio that will achieve the 1.5°C target is a key question for banks. However, it is still difficult to precisely quantify contributions to the climate crisis and the actions required to improve the climate performance of a portfolio. In Chapter 4 we discuss one approach to calculating this deviation (or delta) in a comparable and methodologically agnostic manner.
- **Definition of a benchmark scenario:** climate scenarios offer potential futures under a given climate target. In the banking sector, climate scenarios are usually understood as economic scenarios and

12 This is usually referred to as the "inside out" perspective in discussions of double materiality.

13 For further information, see (German only): https://www.vfu.de/2021/04/16/pcaf-und-fachverband-vfu-foerdern-kompetenzaufbau-zur-messung-finanzierter-emissionen-bei-finanzinstituten-in-deutschland-oesterreich-und-der-schweiz-dach-region/.

14 The PCAF is the underlying carbon accounting method used by the Science-based Targets Initiative (SBTi) for Financial Institutions. The Task Force on Climate-Related Financial Disclosures (TCFD) recommends PCAF for portfolio carbon accounting.

derived from Integrated Assessment Models (IAMs). IAMs help to model the development of an economy and its sectors in line with climate targets and, therefore, provide guidance on steering a sector to align with the Paris climate goals. In Chapter 4, we discuss how to evaluate a range of scenarios to reach consensus on a benchmark scenario. This would help to align the banking sector's expectations for climate action in the real economy and lead to more comparable reporting on the collective climate commitment.[15]

- **Target setting:** banks will set climate targets for their portfolios in line with the voluntary climate commitment beginning in 2023. In 2022, the NZBAG aims to set standards and minimum requirements for target setting. A key question remains: how to tailor targets to the unique business environment of the banking sector?
- **High-impact sector policies and key performance indicators (KPIs):** a few industries emit a major share of global GHG emissions (see Figure 5). This will be reflected in banks' climate strategies and their focus on high-impact sectors. Cooperation between the NZBAG and PtP will support banks with sectoral KPIs, sectoral pathways, and engagement protocols for Germany's 10 high-impact sectors.

GLOBAL GREENHOUSE GAS EMISSIONS BY SECTOR

This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO_2 equivalents

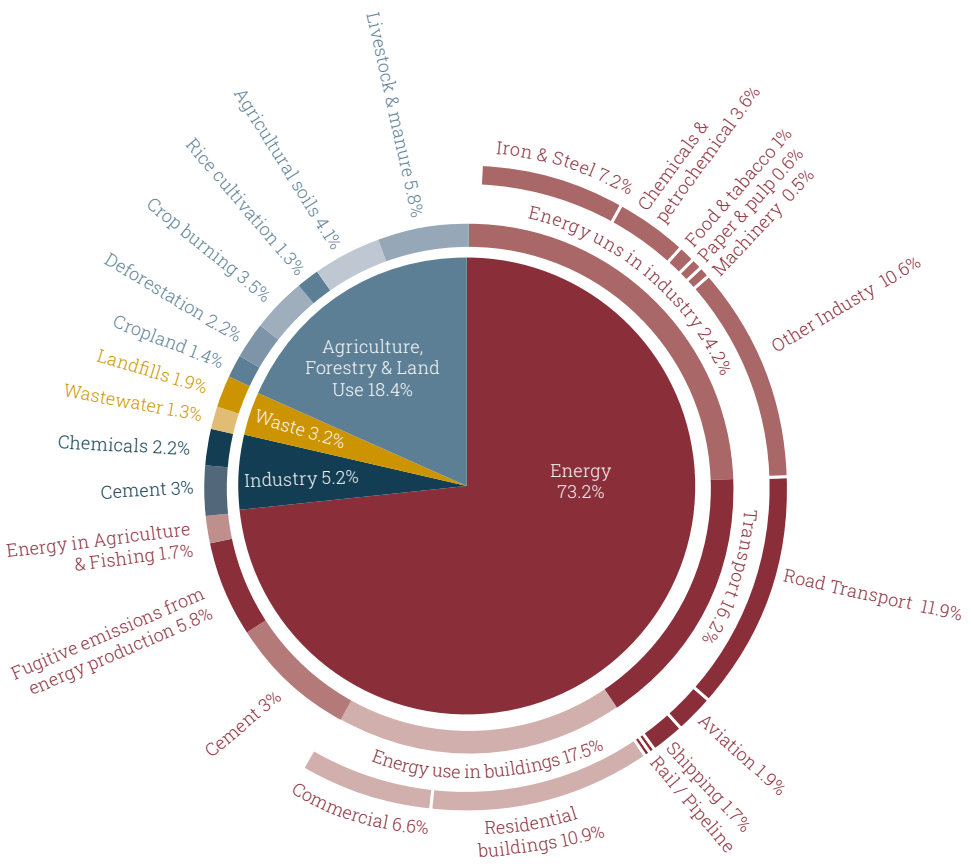


Figure 5: Global greenhouse gas emissions by sector **Source:** OurWorldinData.org

15 It is important to note that the use of benchmark scenarios can lead to risks, particularly over-confidence about a specific economic development that leads to misallocating capital.

- **Client engagement and credit decisions:** the transformation of loan portfolios will mainly occur through banks' engagement with the real economy and credit decisions by market departments. Within the NZBAG, we will discuss how to translate sector targets into meaningful decision guidelines on the decarbonisation of loan portfolios. We will also develop methods, tools, and solutions that allow relationship managers or front officers to initiate dialogue with clients, and define minimum requirements for governance.
- **Green and Paris-compliant loans:** green and Paris-compliant loans are vehicles to support the climate transformation and benefit from climate-related business opportunities. Banks will increasingly be using these instruments. Due to the pre-competitive nature of the NZBAG, loan instruments will play a minor role in our discussions, but discussions on market harmonisation might take place at a later stage of the NZBAG's work.

The following chapters provide an overview of the outcomes of discussions by the NZBAG working groups. This discussion paper is an invitation to reflect on key challenges. We look forward to receiving feedback on discussion outcomes from any interested stakeholder.

> **"The work that we are carrying out within the Net Zero Banking Alliance Germany (NZBAG) on methodology development is an integral part of our strategy to improve our understanding of Climate Risk in our business, estimate our carbon footprint, and set and disclose Paris aligned targets consistently with our pledges. The deliverables under development by the NZBAG will facilitate assessment, analysis and steering of our portfolio. They will also form the basis for active dialogue with our clients on their transition plans. We're absolutely committed, as risk managers, to leverage our core competencies for managing our climate risk and enable the alignment of our portfolio to the Paris targets."**
>
> – Chris Jaques, Deutsche Bank

2. Strategic elements of Paris-aligned portfolio steering

- Loan portfolio steering models help banks align their lending business with climate transition pathways.
- The NZBAG suggests using a emission-based loan portfolio steering,[16] supplemented by technology pathways.
- The NZBAG assumes a fair share mechanism will be used to distribute the carbon budget.

Banks will need to steer their loan portfolios in line with climate pathways to fulfil their climate commitment. This requires measuring current (mis-)alignment and acting on the findings. Steering models support the alignment process and provide a framework to determine the extent to which a portfolio is aligned with Paris targets. Discussions focussed mainly on the following four portfolio steering models:

- Technology pathways: steering via selection of path-compliant technologies;
- Emission-based loan portfolio: steering via allocation of GHG emissions and carbon budgets;
- Temperature score: steering via determination of a temperature score; and
- Shadow pricing: steering via an implied carbon price under a given climate scenario.

Table 1 provides an in-depth description of these steering model options, including the advantages and disadvantages of each. Theoretically, all steering models can be used in a forward-looking manner and should be applicable to different climate scenarios. The steering model options are only assessed for their usability in portfolio steering, banks should consider applicability for risk and other financial analysis separately.

16 Also simplified known as Carbon budget.

Steering Model Option	Description	
Technology pathways	**Technologies** are the main variable used to steer a loan portfolio when using technology pathways. Anticipated technological developments from IAM scenarios, such as the IEA Sustainable Development Scenario (SDS), help to determine alignment with a decarbonisation pathway. A detailed analysis of technology alternatives is required. Technology pathways translate easily into the business realities of real economy actors. Carbon emissions are an implicit element of technology pathways and require decisions on, for example, emission budget allocation per sector and region, inclusion/exclusion of specific technologies, and assumptions about market development. Portfolio steering is possible at the sectoral level by including and excluding specific technologies for financing.	
	⊕ • Closely reflects the reality of the real economy and sector teams • Explicitly states the scope of activities that can be financed and the need for action	⊖ • Difficult to apply to working capital financing and in companies with large product and service portfolios as it is challenging to monitor or assign exact use-of-proceeds and thus to determine financed technology pathway
Emission-based	**Expected future GHG emissions** are the main variable used to steer a loan portfolio based on emissions. Under an emission-based steering approach, the difference between the total GHG emission budget under a specific global warming scenario (e.g. the IPCC's Representative Concentration Pathway (RCP) 2.6) and GHG emissions released since the start of industrialisation provide the restriction to the room of manoeuvre. Carbon budgets need to be allocated (normatively) to countries and sectors. Under carbon budget steering, the fair share of a portfolio (sector- and geography-specific) in a sector is usually used as the benchmark for climate performance. [17]	
	⊕ • Closely aligned with climate science (e.g. the work of the IPCC) • Applicable to the entire loan portfolio	⊖ • Difficult to determine the impact of each financed activity from a macro perspective • Challenge to determine the fair share • Not necessarily easy to communicate

17 Sector budgets are usually expressed in intensity metrics for the loan portfolio steering. The practical application of carbon budgets in loan portfolio steering is further discussed in chapter 3.

Shadow pricing	**Carbon prices** are the main variable used to steer a loan portfolio when using shadow pricing. The idea is to apply economically efficient carbon prices to decarbonise the economy. The bank assesses whether and how portfolios and loans would perform under the given prices based on different scenarios.	
	⊕	⊖
	• Seems closely related to financial analysis	• Does not provide a definitive solution to achieving climate targets (i.e. staying within a carbon budget) as some activities not in line with technology pathways might remain economically viable even with very high carbon prices.
Temperature score	**Temperature alignment scores** are the main variable used to steer a loan portfolio when applying temperature scores. These scores aim to show the current temperature trajectory of a portfolio. The scores usually build on climate models and carbon budgets and require a set of economic variables to test the climate performance of constituents.	
	⊕	⊖
	• Temperature scores are an excellent communication tool as they can be easily compared to the 1.5°C climate goal.	• The range of assumptions underlying a temperature score generates more opaque results, which challenges the accuracy and credibility of the method.

Table 1: Options for portfolio steering models **Source:** NZBAG

The members of the NZBAG decided to use emission-based loan portfolio steering. Most participating banks consider this steering model to be best suited to their operations.[18] The main KPI for this type of portfolio steering is GHG emissions. A carbon budget-derived decarbonisation pathway is expressed in both absolute GHG emissions (e.g., portfolio decarbonisation pathway) and relative GHG emissions (e.g., gCO_2e/output). For high-impact sectors to develop GHG-based sector pathways and policies, robust GHG accounting and material output variables are required. A stylised decarbonisation pathway is presented in Figure 6.

18 SBT FI uses an emission-based analysis for target setting (i.e., using SBT FI means using emission-based loan portfolio steering).

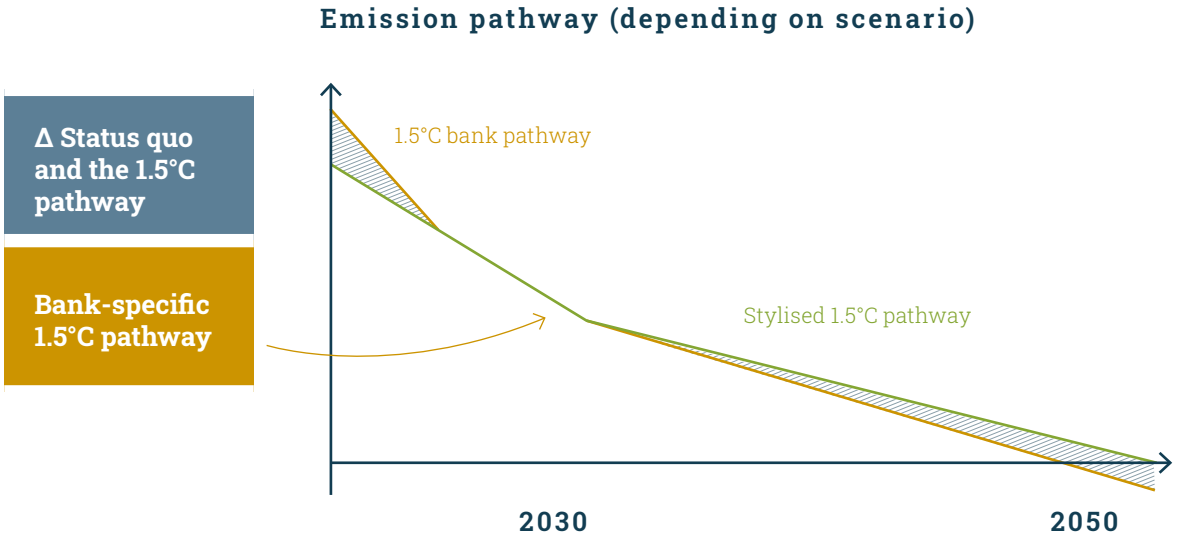


Figure 6: A decarbonisation pathway for loan portfolios **Source:** NZBAG

Single-year targets and the sum of all GHG emissions emitted until the target year (2045) are relevant for emission-based portfolio steering. The concentration of GHG emissions in the atmosphere determines the degree of global warming. Since GHG emissions accumulate in the atmosphere over time, a bank's emission levels in target years and the trajectory are both relevant for steering loan portfolios in line with a 1.5°C target. Consequently, the deviation (delta) between the actual pathway (status quo) and the stylised pathway (1.5°C pathway) in the early years needs to be compensated for in later years to ensure compliance with the carbon budget, i.e. the sum under the decarbonisation curve should not exceed the carbon budget.

The NZBAG suggests supplementing emission-based loan portfolio steering with steering via technology pathways.[19] This steering model closely reflects the business reality of real economy actors and might therefore prove useful when engaging with clients. In addition, many climate scenarios show technology pathways for high-impact sectors.

Banks should consider all relevant GHG emissions in their climate-related portfolio steering.
The business activities of companies are typically associated with three types of GHG emissions:

- Direct emissions: Scope 1;
- Indirect emissions: Scope 2; and
- Upstream and downstream emissions: Scope 3.

Financial institutions should not only assess Scope 1 and 2 emissions, as this often penalises only one party for the GHG emissions of many. Banks should therefore include Scope 3 emissions for most mate-

19 PACTA deploys a technology pathway approach. Signatories to the Katowice Commitment have gained first-hand experience steering portfolios using this method.

rial sectors, and for which benchmarks can be extracted from existing scenarios (e.g., fossil fuel, mining, automotive). This gives companies and banks more incentives to strive for the most effective net zero pathway in the overall portfolio. It is important to note that emission-based portfolio steering and portfolio carbon accounting is technically speaking not necessarily comparable. Whereas more classic approaches to carbon accounting would allow aggregating Scope 1 emissions to measure the effect of a loan portfolio on climate change, emission-based portfolio steering requires a relative analysis of climate performance at the company level, i.e. introducing a benchmarking, see next chapter, as an interim step to analysis the climate impact of a loan portfolio.

The members of the NZBAG support a fair share approach in emission-based portfolio steering. A fair share mechanism helps to determine the necessary contribution of companies or portfolios to the average decarbonisation rate of an industry or the economy. It assumes that all economic actors will contribute roughly the "same" in relative terms to decarbonisation. Climate outperformers will need to do less in the future whereas underperformers will need to do more to catch up. Over time, actors should converge to the industry average. The Task Force on Climate-related Financial Disclosures (TCFD) suggests comparing the intensity of a company's GHG emissions with the industry decarbonisation pathway. A regional breakdown using a fair share mechanism is also possible.[20] The calculation of a fair share budget requires actors to make normative decisions on distributions of budgets and ethical decisions on the definition of "fair". Members of the NZAG will mostly remain agnostic to those questions and work with the distributions of scenario and transition pathway providers as well as tool developers.

Projections of future performance are central to portfolio alignment activities. To forecast future emissions, historical and forward-looking data should be combined (TCFD 2021) since historical trends on their own are not a proxy for future trends and projections of future trends will not necessarily be accurate. Projection data can be neutral (e.g., current emissions held constant), backward-looking (e.g, historical trends in emissions, production, capital expenditure plans, or capacity) or forward-looking (e.g., short-term plans for production or capacity, short-term emissions targets, or long-term emissions targets).[21]

When using carbon budgets combined with technology pathways to measure the alignment of a loan portfolio with Paris climate targets, a combination of historical and forward-looking data can produce effective projections. Through this, tangible past actions are rewarded by recognising the relatively strong performance against industry benchmarks and concrete transition planning is incentivised. Projections should always incorporate multiple data sources, and the weights attributed to them should be based on a credibility analysis of short- and long-term targets (where they exist and given available technology and policy levers) and back-tested to ensure they become more dependable over time.

20 PtP applies this approach, allocating a fair share of the global GHG budget according to the IPCC special report, "Global Warming of 1.5°C" (2018) to Germany using a head count. The result is a remaining budget of 7.4 $GtCO_2e$ for Germany starting from 2020.

21 See Table 3 on p. 38 of TCFD (2021).

"Sustainability will be a clear focus of our work across the bank in the coming years. This includes, for example, implementing sustainability even more strongly in credit risk management. LBBW already classifies significant parts of its loan portfolio. This will be further expanded in the coming years and forms the basis for a sustainable transformation of the portfolio along ESG criteria."

– Cara Schulze, LBBW

Open questions for consultation:

- Loan portfolio steering model: to what degree does the suggested approach reflect common practice internationally?
- Forward-looking steering: which variables are most important in the transition to forward-looking portfolio steering?
- Data: which methods should banks apply to improve data quality?[22] Which existing data sets will help to implement the steering model?
- Reporting: how can banks ensure reported results are comparable, particularly if technology pathways are used to varying degrees?

22 In this context, how can banks improve PCAF-based carbon accounting, particularly in the Mittelstand and among other SMEs?

3. Comparable metrics for measuring Paris alignment of loan portfolios

- The Climate Action Portfolio Indicator (CAPI) should demonstrate the alignment of loan portfolios with Paris climate targets, be methodologically agnostic, and support comparability. CAPI applies to both status quo and forward-looking analyses.
- The Climate Action Sector Indicator (CASI) should demonstrate alignment of specific sectors in a loan portfolio with the Paris climate targets. CASI too applies to status quo and forward-looking analyses.
- Banks should measure the degree of Paris alignment in loan portfolios using a bottom-up approach.
- The measurement should reflect climate relevance for sector and portfolio weights.

Loan portfolios usually include many climate-relevant sectors, and most parts of the portfolios have at least some impact on the climate. Thus, a transparent, comprehensive, and credible Paris-aligned bank should demonstrate climate action at the portfolio level. To do this, the banking sector should develop and use harmonised KPIs. This chapter provides a summary of discussion points and suggests a single, method-agnostic portfolio benchmark to help counter the risk that the free choice of methodologies stipulated in the voluntary climate commitment will result in reporting that is insufficiently comparable.

Many banks do not yet use portfolio-level KPIs to measure Paris alignment. Reasons include the recency of climate commitments, lack of data and lack of generally accepted set of sectoral KPIs and sectoral approaches to climate action. Most climate commitments were signed in the recent past, i.e. since 2019. In addition, the real economy is only beginning to collect climate-relevant data, particularly SMEs. In the few cases where climate-related loan portfolio steering is already happening, it tends to be focused on high-impact sectors, it does not take into account the overarching climate performance of the loan portfolio. Climate-related portfolio steering in the banking sector is also less common than in asset management.

The NZBAG has developed the Climate Action Portfolio Indicator (CAPI) as a single indicator for measuring Paris alignment of loan portfolios to tackle persistent challenges. CAPI is a benchmark indicator that is amenable to various underlying methods and tools[23] to ensure outcomes are comparable In a stepwise process, banks can calculate CAPI by first analysing project or company-level activity, then calculating the climate performance of a sector using the Climate Action Sector Indicator (CASI) and aggregating the results at the portfolio level (i.e., calculating CAPI). In this chapter, we present this process, the overarching ideas and underlying assumptions, and outline the challenges of applying CAPI.

23 This refers to methods and tools that support a Paris-aligned portfolio steering, such as PACTA, PCAF, or SBT FI.

Banks should apply a bottom-up analysis to credibly demonstrate the degree of Paris alignment in their loan portfolios. Banks should start the analysis of alignment with the Paris climate goals at the company and project level. The variety of real economy companies limits the options for sector and portfolio analysis.

CAPI incorporates this concept (see Figure 7). Determining Paris alignment of loan portfolios with CAPI follows a three-step process that measures:

1. **Deviation of a company's climate performance from the sector benchmark:** some climate scenarios provide sector benchmarks that are sufficiently granular to compare the climate performance of a financed company or project to expected sector performance.[24] Comparisons can be made using a single KPI or various KPIs. Whenever possible, banks should use a single KPI to produce clearer results [25].
2. **Aggregation of a company's climate performance at the sector level (CASI):** in a second step, the climate performance of a single company or project is aggregated at the sectoral level. The CASI approach considers the weight of the loan in the portfolio.
3. **Aggregation of sectoral performance at the portfolio level:** in a third step, banks should aggregate sectoral climate performances (CASIs) to the portfolio climate performance (CAPI). CAPI weighs sectors by their climate and business relevance.

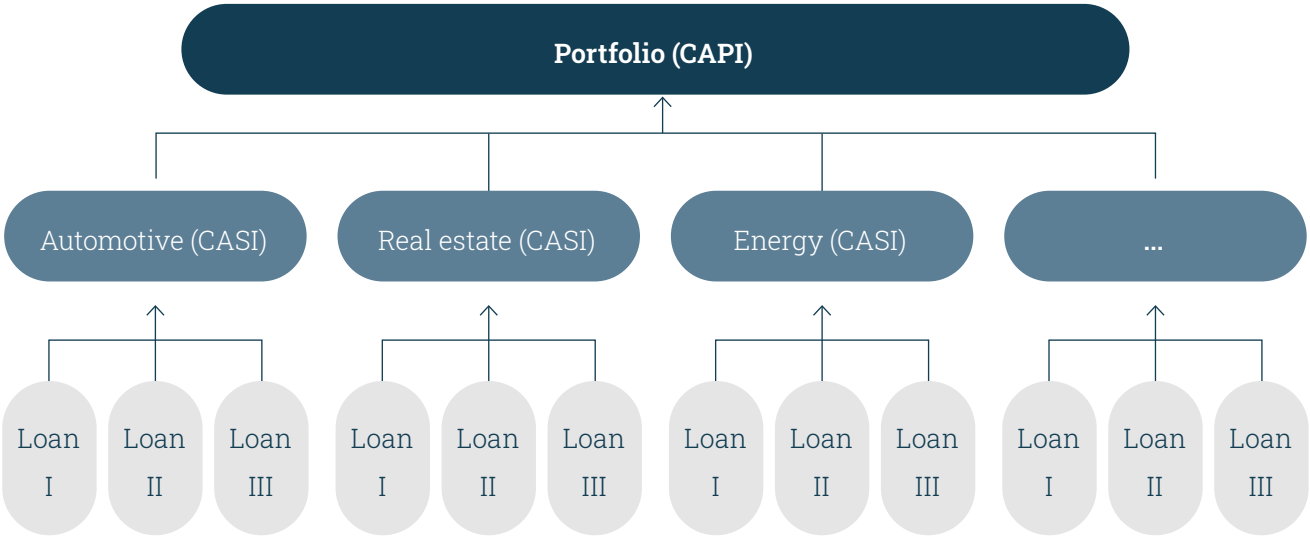


Figure 7: A three-step approach to portfolio alignment **Source:** NZBAG

24 For example, a utility can, amongst other KPIs, use share of renewable energy sold to demonstrate Paris alignment.

25 The use of several KPIs might better reflect the climate transformation in a given sector. However, correlation between different KPIs and weighing of several KPIs in an analysis might render the analysis more complex. As a result, specific analysis outcomes might become more difficult to explain.

This approach has several advantages that **it is methodologically agnostic** and CAPI works with all common climate alignment methods and tools. Furthermore, **it is applicable for both status quo and forward-looking analyses** by showing the delta to the benchmark, but it can also be used in a dynamic, forward-looking manner, which requires the integration of forward-looking information (see at the end of the chapter).

Example: The following exemplary loan portfolio (Table 2) should help to illustrate how CAPI works. It also shows the effects of potential changes to a loan portfolio.

Sectors and sector weight	Automotive (45%) Buildings (14%) Utilities (41%)
Number of companies	Three per sector (3x3)
Number of loans	Nine (one per company)
Tenor	All 10 years

Table 2: Overview of an exemplary loan portfolio **Source:** NZBAG

Measuring climate performance at the company level

Assessing Paris alignment of loan portfolios starts at the company or project level. The analysis that leads to the calculation of CAPI requires loans to be benchmarked to one or several sectoral benchmark KPI(s). There are at least four types of KPIs that can be compared to respective benchmarks:

1. **Absolute GHG emissions:** banks use the absolute GHG emissions of a project or company.
2. **GHG emission intensity of the loan:** banks calculate this KPI by dividing the GHG emissions associated with the loan by the size of the loan. Either all GHG emissions of the company or project or a fair share[26] of them are the basis for the calculation. The benchmark value is the quotient of allowed emissions in the industry based on a given climate scenario and the estimated overall financing required in the industry[27].
3. **GHG emission intensity of an output:** such KPI requires banks to define the relevant physical or financial outputs of a given industry. The KPI is the quotient of activity-related GHG emissions and

26 Bank should calculate fair shares using standard methodologies such as PCAF.

27 Economics departments would need to support the process of estimating the investment needs. However, as such estimations are usually subject to many assumptions and thus might deviate between banks, transparency on the estimation and underlying methodologies should be sought.

the unit of outputs. For example, GHG emissions per kilowatt-hour (kWh) of electricity produced, CO_2e per kWh, or GHG emissions per unit of revenue (CO_2e/EUR). Some climate scenarios provide direct industry pathways for those KPIs and it is possible to derive them from scenarios. The benchmark value is the industry average.

4. **Industry or production-specific variable:** there are various types of industry-specific variables, including industry certificates (e.g., energy performance certificates (EPCs) in the building sector), shares of industry-specific technologies in the product mix (e.g., percentage of electric vehicles (EVs) sold), or demonstration of sustainable practices (e.g., following sustainable agricultural practices). Climate scenarios usually provide at least a basis for determining industry-specific reference values (e.g., 23% EVs sold of overall sales).

Where possible, banks should apply options three and four for Paris-aligned portfolio steering.[28] Those variables closely reflect the transformation of business models in the real economy and can be extracted from most climate scenarios. Option two appears to be appropriate if sectoral emission pathways are available but sector-specific KPIs are missing. However, it does not have a direct link to the business operations, the benchmark value is based on many assumptions and not harmonised industry-wide, and the quotient is highly dependent on the type of financing used and the remaining loan amount outstanding. Option one does not appear useful for making decisions about portfolio steering as it is an absolute value and thus difficult to compare, but it could be relevant for portfolio carbon accounting.

Banks should use life cycle GHG emissions wherever possible and useful for making meaningful decisions about decarbonization (in line with discussions in the next chapter). Life cycle GHG emissions reflect the climate impact of many products and services more accurately than direct (and indirect) emissions. For instance, a large share of GHG emissions from the oil and gas industry does not result from exploration and extraction but from upstream use.

Through the PtP project, real economy and financial industry representatives are developing KPIs, sectoral pathways, and engagement protocols for ten of Germany's high-impact sectors:

1. Electricity generation
2. Steel manufacturing
3. Cement manufacturing
4. Car manufacturing
5. Road freight transport
6. Ammonia and synthetic gases
7. Plastics manufacturing
8. Livestock production
9. Commercial real estate
10. Residential real estate

When calculating CAPI, banks can use the outputs of the PtP project for their company analysis.

28 The NZBAG welcomes a similar position by the TCFD on the matter.

Benchmarking company or project-specific KPIs against the sector pathway requires data. However, banks usually do not have the required set of data readily available. In addition, disclosure requirements do not have sufficient scope or granularity to conduct a complete assessment with publicly available information.

Example: The climate debate already focusses quite heavily on three sectors in the exemplary portfolio. The following exemplary industry and production-specific variables could be considered to assess deviation from the industry benchmark. Table 3 lists the KPIs for these sectors.

Sector	**KPI**[29]29	**Sector benchmark in 2023**[30]30	**Rationale**
Automotive	Share of zero tailpipe emission vehicles sold	15%	The transition to a zero-emission transport system will require vehicle fleets that do not combust fossil fuels.
Buildings	Buildings with a given or higher energy performance certificate (EPC).[31]		Nine (one per company)
Utilities	Share of renewable energy sold	50%	A large share of electric energy, heating, and cooling will need to come from renewable sources in a decarbonised economy.

Table 3: Sector-specific KPIs relevant to an exemplary portfolio **Source:** NZBAG

For the exemplary portfolio, we have assumed there is reference data for all nine companies.

29 KPIs need to be tailored to the specific business positioning in the supply chain.

30 These benchmarks are fictional and only serve as an example. In reality, banks derive benchmark values from climate scenarios (see Chapter 4).

31 EPCs indicate the fit with the efficiency requirements of buildings in climate scenarios.

Table 4 makes it apparent that some companies are exceeding their benchmark while others are underperforming.[32] In future client engagements, banks would ensure all companies are aligned with the benchmark.[33]

Company	Sector	Sector or production-specific KPI
Energy mix	Utilities	25%
Green	Utilities	100%
Brown	Utilities	0%
Old ownership	Buildings	E
Renovation Inc	Buildings	A
Carbon-neutral buildings	Buildings	B
Electrify	Automotive	70%
Race car	Automotive	0%
Family cars	Automotive	10%

Table 4: Climate KPIs of loans in an exemplary portfolio **Source:** NZBAG

32 Please note that the analysis remains static as it is only an example. For it to become decision-relevant, banks should take a forward-looking perspective. Where possible, banks should consider the economic life cycle of assets (e.g. infrastructure or real estate). The TCFD discusses approaches to forward-looking analysis (2021).

33 The TCFD recommends applying a convergence rather than rate-of-reduction approach to most sectors. It seems to be a fairer approach (2021) as it does not penalize current frontrunners.

Measuring climate performance at the sector level

The Climate Action Sector Indicator (CASI) measures the climate performance of a sector. CASI is the sectoral aggregation of a company's climate performance weighted by loan size. Calculating the CASI is an interim step when aggregating the climate performance of a company against its benchmark and the overall climate performance of a loan portfolio. Figure 8 illustrates the logic behind the calculation of CASI is calculated for a loan portfolio of three energy companies. CASI is the deviation of the company's climate performance (measured by the climate KPI) from the sector benchmark (given by the climate scenario). The sector benchmark is compared to the benchmark for the target year. This way, CASI harmonises results for sectors with different GHG emission target levels (i.e. positive, zero, and negative).

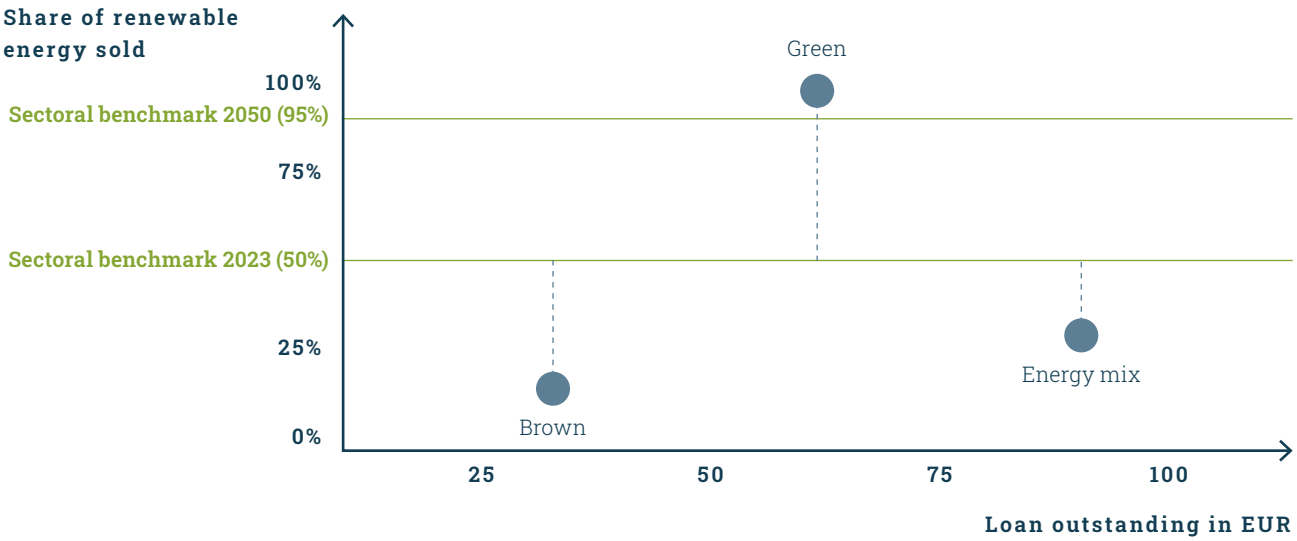


Figure 8: Demonstration of the Climate Action Sector Indicator (CASI) **Source:** NZBAG

Banks can calculate CASI using the following formula:[34]

$$CASI_{iy} = \sum_{j=1}^{n} \frac{Company\ climate\ indicator_{jiy} - sector\ benchmark_{iy}}{sector\ benchmark_{i2050} - sector\ benchmark_{iy}} \times \frac{EUR\ outstanding_{jiy}}{EUR\ outstanding\ sector_{jiy}}$$

where: $i = sector$
$j = company$
$y = respective\ year$

$if: sector\ benchmark_{iy} = sector\ benchmark_{i2050}\ then: Company\ climate\ indicator_{jiy} - sector\ benchmark_{iy}$

34 Please note that the approach in the formula deviates from the suggestion by the TCFD. Whereas the TCFD recommends using an aggregated budget approach to be more scientifically robust, CASI provides a portfolio weighting based on greater business relevance as it reflects the core banking operation more strongly in relation to the climate performance. The TCFD recognises the benefits of portfolio weighting and therefore does not oppose the approach. Discussions in the NZBAG have shown that portfolio weighting seems to be more decision-useful and closer to the operational reality of portfolio steering.

Exogenous factors in the calculation are the sector benchmarks for the current year and the target year, which are given by the climate scenario. The company should provide the company climate indicator (i.e., the climate KPI for the specific real economy company) to the bank. Third-party data providers or by public data sources could also make the information available to the bank. Information on the loan amount and the sectoral loan size should be calculated internally by the bank.

Banks can interpret CASI in the following way:
The value of CASI can take positive and negative values. The benchmark value of 0 represents alignment with the climate pathway provided by the climate scenario. That is, the company's climate performance equals the sector benchmark. For instance, if the energy sector's benchmark KPI for a given year was the share of renewable energy sold at 60 per cent, a CASI of 0 would mean that the weighted average share of renewable energy sold in the energy loan portfolio is 60 per cent. Values larger than 0 represent out-performance, values less than 0 underperformance against the sector benchmark. A value of 1 indicates achievement of the benchmark for the target year (2045 or 2050). Positive values above 1 are mathematically possible but will rarely appear in reality. Negative values can theoretically be infinite but values should remain in the range to −10.

Example: Table 5 shows the results of applying the formula to an exemplary portfolio. The automotive share of the portfolio outperforms the sector benchmark, utilities perform near the benchmark, and loans to the building sector do not meet the benchmark. By applying a convergence approach[35], the bank could begin to develop sector strategies and policies.

Sector	Sector weight in portfolio	CASI
Automotive	45%	0.26
Buildings	14%	-0.85
Utilities	41%	-0.10

Table 5: CASI of an exemplary portfolio **Source:** NZBAG

35 Under the convergence approach, a company is benchmarked against the industry average from a scenario.

"We as ING make the most impact through our financing – via the money we loan to our customers. 2018 we started to steer our loan book of about € 700 billion across many sectors towards meeting the Paris Agreement's climate goals. With the Terra approach we are focusing on the sectors responsible for most greenhouse gas emissions: power generation, fossil fuels, automotive, shipping, aviation, steel, cement, residential mortgages and commercial real estate. We are measuring whether our lending in each sector is adding up to contribute to the Paris climate goals. Per sector, we use the most appropriate methodology available. However, PACTA for Banks is one of the methodologies that applies to most sectors in scope.
We co-created this methodology with the 2° Investing Initiative (2DII), a global think tank developing climate metrics in financial markets. It looks at the technology shift that's needed across certain sectors to slow global warming and then measures this against the actual technology clients are using – or plan on using in the future."

– Tatjana Gravenstein, Expert Sustainability ING Germany

CAPI: a single portfolio KPI

The Climate Action Performance Indicator (CAPI) is the aggregation of CASI at the overall, cross-sectoral loan portfolio level and should work as a single variable for steering a climate-related portfolio. The following formula describes the aggregation that weighs the CASI by relevance to the loan book and climate impact. Sectors that are more relevant to a bank's business have a higher CAPI weighting and vice versa. The same applies to the climate relevance of each sector. The NZBAG suggests weighing sectors by their share of emissions in the given climate scenario. The weightings gear the CAPI towards climate action by the bank and core business performance. The aim of this approach is to reflect the business reality of a bank, i.e. the bank specific loan portfolio structure, and the effect of the loan portfolio on the climate. This way, CAPI combines the core of the banking business while it remains focused on the areas with a high climate impact in the loan portfolio.

$$CAPI = \sum_{i=1}^{n} (CASI_i \times Sectoral\ portfolio\ weight_i \times \#\ of\ sectors \times emission\ share\ of\ sector)$$

where: $i = sector$

For the calculation of CAPI, banks first need to calculate CASI (see above). The emission share of the sector should be taken from the climate scenario (i.e., sectoral GHG emissions for the given year divided by total GHG emissions for the given year). The sectoral portfolio weight results from the division of loan volume in EUR for the sector by the total volume of the portfolio. For the number of sectors, banks should count the number of sectors relevant to the CAPI calculation (i.e., the sectors for which they calculated CASI before).

Banks can interpret their portfolio CAPI as depicted in Figure 9 below. While a CAPI of 1 means that the portfolio is already Banks can interpret CAPI as depicted in Figure 9 below and follow the rule that a lower CAPI score means a worse climate performance of the loan portfolio. While a CAPI of 1 means that the portfolio is already aligned with the 2050 goal[36] (or the 2045 goal for the German portfolio), 0 indicates alignment with the pathway.[37] Negative results indicate the need to improve climate performance in the portfolio. The below given interpretation of negative CAPI scores is indicative and based on several exemplary calculations during the development of the indicator. Feedback on an improved interpretation of the results is welcome. The calculation of company performances and CASI can inform the development of improvement measures.

Figure 9: Interpretation of CAPI (and CASI) **Source:** NZBAG

Example: The CAPI of an exemplary portfolio is -0.04,[38] which is close to aligning with the Paris climate goals. However, it is important to note the differences in sectoral climate performance highlighted by CASI when developing measures to improve CAPI.

Using CAPI and CASI in a forward-looking analysis

Aligning portfolios with the climate transformation pathway requires a forward-looking analysis. The design of CAPI and CASI allows banks to reflect future developments and anticipate their borrowers' climate action. A dynamic application would include at least:

- **A change in portfolio structure:** reflecting, inter alia, expiring loans, the payback of loan principals, expected new business, and changes in sectoral distributions of the portfolio.
- **Strategies by borrowers:** engagement with the real economy helps banks estimate the future climate performance of borrowers, for example, a utility that is planning to replace a coal-fired power station by wind farms.[39]

36 This becomes intuitively visible by inserting some numbers in the first term of the CASI formula. The term will become 1 if the company performs at the target benchmark as numerator and denominator become equal.

37 The numerator of the first term of the CASI formula turns 0 if the company climate performance equals the benchmark for the given year.

38 For this example, we have assumed that the three sectors are equally important to mitigating the climate crisis. Hence, climate relevance does not affect the result.

39 The TCFD discusses this aspect further in its Technical Supplement (2021). The NZBAG aims to tailor the TCFD discussion to the banking context and harmonise forward-looking analysis in the German banking sector.

- **Dynamic sector benchmarks:** climate scenarios provide a time series for sector benchmarks (see Chapter 4 for more details) that show how CASI and CAPI change as maximum annual global GHG emissions decline.

An open source demonstration tool for CAPI and CASI can be found here.
The tool is designed for users to familiarise themselves with CAPI and CASI. Feedback is appreciated.

> **"We want to set quantitative targets for our portfolios in order to keep the global temperature in line with the Paris Agreement. To ensure that this is done in a transparent and science-based approach, we've joined the Science Based Targets initiative in September 2020. In the future, we want to transform our credit portfolio towards a more sustainable approach and provide our stakeholders with decision-making information based on transparent and comparable benchmarks. Therefore, we see ourselves as a strong partner for our clients. We support the financing of the transformation into a low-carbon economy of tomorrow."**
>
> – Silvia Sauer, Sebastian Müller and Anja Özer, Commerzbank

Open questions for consultation:

The development of CAPI and CASI is ongoing and will continue. Several questions remain, and while the NZBAG will try to tackle many of them, input from interested stakeholders is welcome in particular on the following issues:

- **Data:** how to gain access to relevant data? How can banks design an efficient implementation process? Which data should be collected by banks directly as compared to by data providers or the public? A particular challenge is accessing data for portfolios of small and medium-sized enterprises (SMEs) and real estate.
- **Sectors with limited climate relevance:** to what degree should sectors with limited climate relevance be excluded from being included in CAPI calculation? Excluding sectors might increase the climate relevance of CAPI but also might make it less relevant to the business reality of a bank.
- **Sectors without a climate-related benchmark:** how to deal with sectors that do not (yet) have a benchmark or KPI that enables meaningful decisions? This question is particularly relevant when an industry may represent a significant share of a portfolio but plays a minor role in the climate debate.
- **Total loan versus outstanding loan:** should banks base their CAPI and CASI calculations on the notional or on the residual loan amount? While the notional might better reflect the climate impact of financing, the residual loas might better reflect the dynamic business reality of the bank. The NZBAG currently tends to use residual loans amounts.
- **Compensating for CAPI <0:** to what degree should banks compensate for CAPI <0? If a bank decides to use sector benchmarks and is not able to meet the benchmarks for its portfolio today, it might need to compensate later, i.e. a 'liability'. As the remaining global GHG budget shows an absolute value, the annual deviation results in a deviation from the overall maximum total GHG emissions, which increases global warming. Therefore, alignment with the Paris climate goals could mean compensating for deviations along the pathway. Carbon credits do not seem to be a credible instrument to compensate for GHG emissions at scale.
- **Working capital and uncommitted capital in CAPI:** how should banks treat working capital loans and other loans without concrete use-of-proceeds in a CAPI calculation? It is difficult to allocate working capital loans and uncommitted loans for corporates with a portfolio of varying economic activities in different sectors to one sector. Currently, the preferred option is to allocate the company based on its primary activities, which improves usability but might render CAPI less informative.

4. Towards a benchmark scenario

- The NZBAG recommends that minimum requirements for scenarios should be applied to loan portfolio steering under the voluntary climate commitment.
- The NZBAG selects benchmark scenarios for a 1.5°C and a well-below 2°C pathway for the global and German economy.
- Discussions on defining a single benchmark scenario under the voluntary climate commitment are ongoing.

Decarbonisation scenarios, a subset of climate scenarios, provide specific pathways to achieve the Paris climate goals. They help banks understand how emissions or production capacity should evolve across the economy to meet a climate target given certain socioeconomic conditions. Those decarbonisation scenarios are a vital steering tool for banks to decarbonise their portfolios. They offer ways to divide a global carbon budget across time, geography, and sector that would restrict global warming to the climate target.

According to the TCFD (2021), all portfolio alignment methods using decarbonisation scenarios have three common steps:

1. Translating scenario-based carbon budgets into normative **climate benchmarks**[40];
2. **Measuring company performance** against these benchmarks; and
3. **Aggregating company-level scores** into portfolio-level metrics.

Scenarios are relevant in the risk context as well. Climate-related risk assessment also involves scenario analysis and stress testing. Scenario analysis estimates the expected value of a portfolio after a given change in the values of key parameters. Stress testing is a computer simulation technique used to test the resilience of financial portfolios against possible future situations. In both cases, decarbonisation scenarios provide information on changes to key parameters due to the various impacts of climate change.

Minimum requirements for scenarios under the voluntary climate commitment

The NZBAG aims to harmonise climate ambitions and make climate action more comparable by defining minimum requirements for scenarios under the voluntary climate commitment. These requirements are developed through a comparative analysis of standards by international climate alliances in the financial industry. In general, banks should use the most ambitious decarbonisation scenario for the

40 For a discussion on potential benchmarks, see chapter 3.

given warming target that produces the fastest reductions and the least cumulative GHG emissions since scenario apply probabilities to achieving the warming goal. This means that if the global economy were decarbonised in line with decarbonisation scenario, it would not necessarily lead to expected degree of global warming (for some scenarios only in one out of two cases). Table 6 outlines the minimum requirements for decarbonisation scenarios recommended by the NZBAG. NZBAG has developed the requirements based on the work of international initiatives such as the Net Zero Asset Owner Alliance (NZ AOA, 2021) and the UNEP FI Net Zero Banking Alliance (UNEP FI, 2021).

Criteria	Description	Minimum requirements
Temperature goal	The degree to which the global mean temperature is assumed to rise by the end of the century compared to pre-industrial levels under the given scenario. This criterion indicates the climate ambition of loan portfolio steering.	Limiting global warming to 1.5°C (or well below 2°C).
Negative emissions technologies	The use of negative emissions technologies increases the overall emission budget by reducing atmospheric emissions. Usually, technologies include Direct Air Capture (DAC), Bioenergy and Carbon Capture and Storage (BECCS) and land use, land use change and forestry (LULUCF). Global application of these technologies on a large scale is questionable, however, as there is great uncertainty about whether these technologies will become available. Climate-related portfolio steering becomes more credible as negative emissions technologies are used less.	No inclusion of unproven negative emissions technologies.
Geographical and sectoral granularity	Climate scenarios have varying geographical and sectoral granularity. Some set high-level benchmarks (e.g., across large industry groups or a wide geographical area) while others set more granular benchmarks. High-level benchmarks tend to penalise sub-sectors and countries that must decarbonise more slowly than the global, regional, or industry average.	Prioritising granular benchmarks that capture meaningful material differences in the feasibility of decarbonisation across industries or regions.
Covered sectors	Climate scenarios can help banks steer the portfolios of high-impact sectors. To be effective, the scenario must cover all high-impact sectors in their portfolios.	All high-impact sectors in Germany should be covered or supplemented with sector-specific scenarios.

Sector-specific scenarios	Standalone, sector-specific scenarios can provide more granular information and might assist with more in-depth analysis of sectors. For the scenarios to be credible, it is important that they use the same or more ambitious GHG budget allocations as in the overarching scenario.	Sector-specific scenarios may be used if they are aligned with the temperature goals of the Paris Agreement, fulfil other minimum requirements, and have a GHG budget allocation that is at least as ambitious as the one in the main scenario.
Considered GHGs	Most relevant GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbon (HFC) gases, and other synthetic gases. The gases differ in their Global Warming Potential (GWP).[41] For portfolio steering to be credible, the scenario needs to cover all major GHGs.	All[42]
Overshoot	Climate scenarios are usually modelled on global temperature rise by the year 2100. Overshoot describes the temporary rise of the global mean temperature above the climate target. Overshoots can potentially have severe consequences for life on Earth and the economy. For portfolio steering to be credible, it is common practice to use no-overshoot or low-overshoot scenarios.	No-overshoot or low-overshoot (P1, P2, P3 type) scenarios (see IPCC 1.5°C).
Base year and time horizon[43]	Climate scenarios have a base year and a time horizon. While neither have a direct effect on portfolio steering, they determine the narrative of the scenario. To demonstrate Paris alignment, at minimum, the period between the signing of the agreement and climate neutrality should be shown.	Base year: benchmarked against 2016, if possible. Time horizon: until 2050.

41 See: Klimaschutz-Selbstverpflichtung des deutschen Finanzsektors / Collective Commitment: https://cdn.website-editor.net/8475c96237754ffc80b1a6b6961f9bcb/files/uploaded/German%2520collective%2520commitment%2520to%2520climate%2520action%2520of%2520financial%2520sector.pdf

42 The NZBAG welcomes the suggestion by the TCFD to introduce specific pathways for methane in the medium term.

43 For more details, please consult with the Pathways to Paris project team.

GHG budget	The GHG budget shows the residual anthropogenic emissions that can possibly be emitted if humanity is to achieve a specific maximum global warming goal. A more ambitious goal would logically require a smaller budget. Paris-aligned portfolio steering is more ambitious if the GHG budget is also more ambitious.	World: in line with IPCC scenarios of <992 $GtCO_2e$ starting in 2016. Germany: in line with PtP scenarios of <7.4 $GtCO_2e$ s tarting in 2020.
Probability of reaching climate goal	The underlying climate model of a scenario usually includes the probability of reaching the global warming goal as a limiting factor. A higher probability of reaching the goal results in a smaller GHG budget and more ambitious decarbonisation of the economy. It is common practice to assign probabilities of 50% or 67% to specific goals. This means that steering a portfolio in line with the scenario might not be sufficient to achieve the climate targets. Therefore, banks should aim to set more ambitious targets than the scenarios.	1.5°C (50%) 1.75°C (67%)
Dealing with trade-offs	Societies will need to deal with trade-offs in the transformation of the global economy. From a sustainability standpoint, other environmental and social factors should be considered. Scenarios partially reflect those aspects, often derived from the Shared Socioeconomic Pathways (SSPs). For portfolio steering to be socially acceptable, it may be useful to select scenarios that cause minimum social upheaval.	Minimise misalignment with other SDGs.

Table 6: Minimum requirements for decarbonisation scenarios **Source:** NZBAG

The NZBAG suggests using a single scenario benchmark approach rather than a global warming function approach. This will improve the usability of scenarios in the banking sector, as results of a single scenario are clear-cut and thus are easier to understand and implement with real economy clients.

Recommended benchmark scenarios under the voluntary climate commitment. The NZBAG suggests using the following scenarios for Paris-aligned portfolio steering (see Table 7). Although these scenarios do not necessarily fulfil all minimum requirements, they appear to be the most suitable. The NZBAG welcomes any efforts by scenario providers to apply the suggested minimum requirements to their scenarios.

	1.5°C	Below 2°C
World	• NGFS: Net Zero 2050 (1.5°C) • IEA: NZE2050 • UTS: One Climate Earth Model for 1.5°C	• IEA: SDS • IEA: B2DS • NGFS: Orderly below 2°C
Germany	• UBA Rescue: Green Supreme • UBA Rescue: Green Ee2 • Agora Klimaneutrales DE: Kn 2050	The NZBAG focuses on 1.5°C in Germany in line with the PtP project

Table 7: Recommended benchmark scenarios **Source:** NZBAG

In the following, a short introduction to the scenarios from Table 7 is provided.

In the **NGFS Net Zero 2050 (1.5°C)** scenario net zero CO_2 are achieved around 2050. Some jurisdictions achieve net zero emissions for all GHGs. The **Orderly below 2°C** results in a 67 per cent chance of limiting global warming to below 2°C and emissions reach net zero in the 2070s (NGFS, 2021).

The International Energy Agency (IEA) recently published the **Net Zero Emissions 2050 (NZE2050)** scenario. The global roadmap to net zero emissions detailed in the report requires all governments to significantly strengthen and successfully implement their energy and climate policies. The scenario does not cover LULUCF (IEA, 2021).

The University of Technology Sydney (UTS) published the **One Climate Earth Model for 1.5°C**, one of the most detailed climate and energy studies ever produced. The model demonstrates the feasibility of achieving the 1.5°C target by 2050 through 100 per cent renewable energy and natural climate solutions, such as conservation and reforestation (UTS, 2019). The United Nations Environment Programme Finance Initiative (UNEP FI) evaluates the model as very suitable since it can be readily translated into granular sector pathways for energy, utilities, materials (specifically steel and cement), and transport (UNEP FI, 2020).

The IEA published two scenarios for a below 2°C pathway: the **Sustainable Development Scenario (SDS)** and the **Beyond 2°C Scenario (B2DS)**. Each scenario provides a rapid decarbonisation pathway in line with international policy goals.

In the Umweltbundesamt[44] (UBA) **RESCUE GreenSupreme** scenario, the most effective measures from previous green scenarios are combined to further reduce GHG emissions and raw material consumption until 2050. Under this scenario, annual gross domestic product (GDP) growth is assumed to be zero after 2030 (UBA, 2019a). In the UBA **RESCUE Ee2**, the focus is on implementing energy efficiency measures across all sectors. It shows how climate neutrality can be achieved without nuclear energy and technical sinks, such as CCS (UBA, 2019b).

44 German Environment Agency.

Under the **Klimaneutrales DE (Kn 2050)** scenario, Agora Energiewende[45] describes scientifically based strategies and measures for climate neutrality, with a particular focus on pathways that can achieve climate neutrality in Germany by 2050 at the latest (Agora, 2021a). Agora Energiewende recently published Klimaneutrales DE (Kn 2045) to align with the new target by the federal government (Agora, 2021b). The NZBAG will consider the usability of the new scenario for German portfolios.

Open questions for consultation:

- Should the NZBAG aim to define a single benchmark scenario under the voluntary climate commitment? Although this could make the climate action of different banks more transparent and comparable, it might lead to a single scenario exerting excessive influence on capital allocation.
- How can banks use sector-specific scenarios without compromising the credibility of portfolio steering?
- Should the NZBAG consider different climate scenarios? If yes, which ones?
- Do minimum requirements for climate scenarios reflect the latest science? If not, how should the NZBAG adjust the requirements?

> **"Our approach can be applied to any financial instrument but our focus is largely on corporate credit portfolios, as this provides the greatest advantage to drive sectoral transformation on a global scale. Each economic sector provides its own set of indicators and refers to its own benchmark and targets. Therefore, sector-specific targets as opposed to a global one, i.e. total of CO_2 emissions are important. For consistency, BNP Paribas ("BNPP") aims to rely on a single climate scenario for all sectors; although some scenarios do not provide indicators for all industries. Our sector-specific scenario aims to have a consistent temperature ambition. BNPP believes it is important to accompany existing clients towards lower carbon practices, prioritizing an engagement approach over divestment. Nevertheless, we divest if no other options remain and there is no signs of transitioning by a specific company or sector (i.e. Tobacco). To track the impact associated with a bank's financing and to enable steering, this approach focuses on asset-level data. Whenever possible, the selected data sources feature production and emission forecasts. Likewise, we start considering the maturity profile of our lending portfolio, therefore enabling a forward-looking alignment analysis."**
>
> – Frank Sibert and Sabine Lafon, BNP Paribas

45 Energiewende means energy transition.

5. Defining positive impacts on climate change mitigation

- The EU Taxonomy is a suitable KPI for measuring positive climate impacts of loan portfolios.

The financing activities of a bank can have a positive impact on climate change mitigation. The provision of capital to transformative economic activities will accelerate the transformation of the global economy by providing liquidity and reducing capital costs. Both Germany's and the EU's sustainable finance strategies and roadmaps highlight the need to finance certain activities. Signatories of the financial sector's voluntary climate commitment not only work to reduce GHG emissions in their own portfolios, but also aim to contribute to climate change mitigation by portfolio alignment with the temperature goal.

The NZBAG suggests using the EU Taxonomy as a KPI to measure positive impact on climate change mitigation in the loan portfolio. Annex I to the Commission Delegated Act supplementing Regulation (EU) 2020/852 defines technical screening criteria for a number of economic activities.[46] The document will form the basis for measuring positive impact.

The EU Taxonomy appears to have become the European standard for measuring green impact. Several banks already provide EU Taxonomy-aligned products and services to the market. Banks will most likely need to report EU Taxonomy-aligned activities as part of the Green Asset Ratio as recommended by the European Banking Authority (EBA).[47] Therefor, additional transaction costs for banks to implement the KPI EU Taxonomy in the context of the voluntary climate commitment are expected to be very low.

The NZBAG welcomes the forthcoming expansion of the EU Taxonomy to cover more sectors and potentially the indication of significant harm and no significant impact activities.

The NZBAG will develop concrete ideas on how to apply the EU Taxonomy in the context of the voluntary climate commitment by the end of 2022.

Open questions for consultation:

- Should the NZBAG consider using KPI(s) other than the EU Taxonomy to measure positive climate impact? If yes, which one(s)?

46 For a user-friendly list of activities and criteria, see: EU Taxonomy Compass.

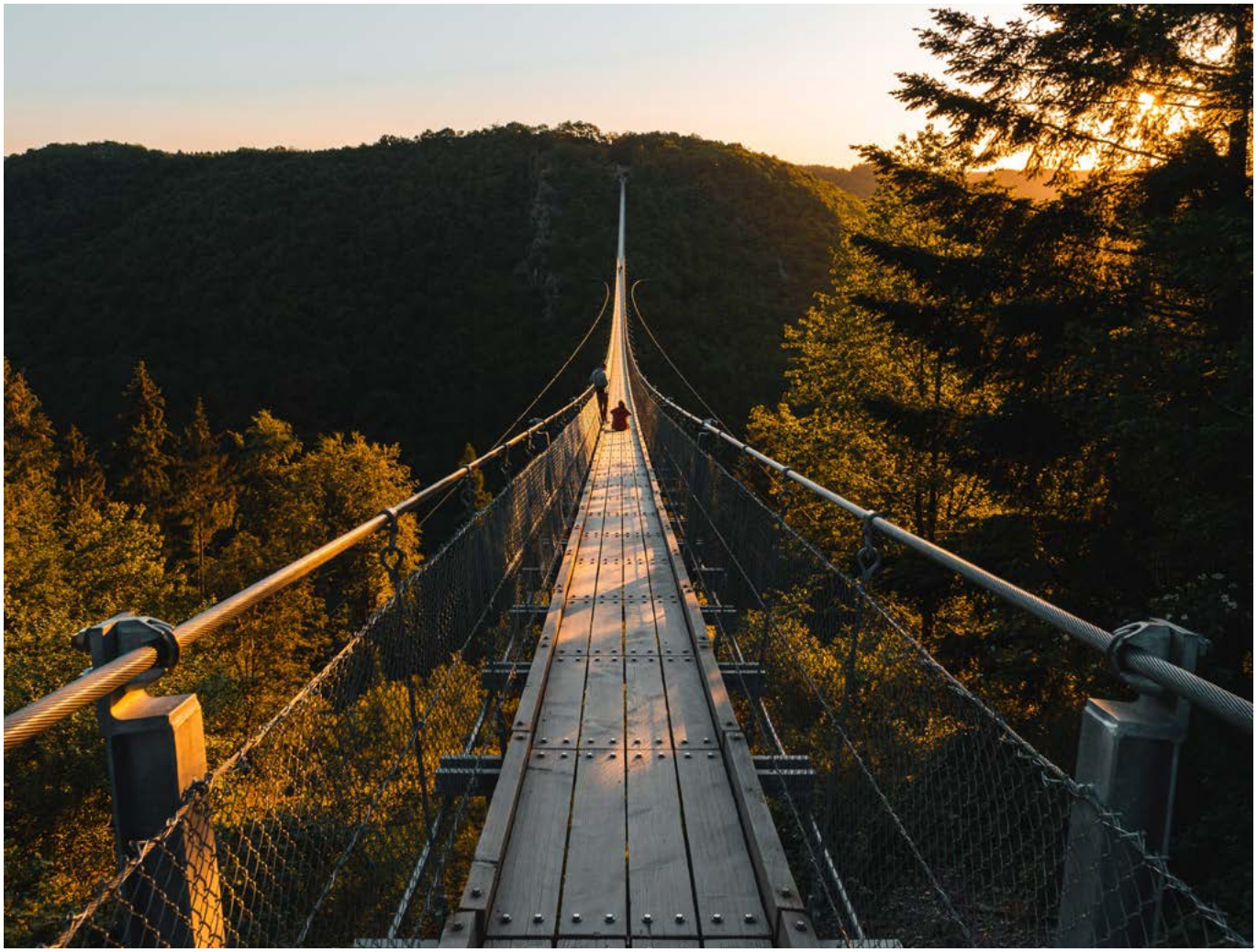
47 For further information, see: European Banking Authority. (1 March 2021). "EBA advises the Commission on KPIs for transparency on institutions' environmentally sustainable activities, including a green asset ratio".

"As a classification system, the EU taxonomy will not only be a central component of the EU's sustainable finance activities and shape the visibility and scope of sustainable investments, but it will also influence the relationship with our customers in the long term.

In this context, the question of how we as DZ BANK can most effectively support our customers in their transformation processes towards sustainability and what kind of sustainability-specific expertise is needed for customer advisory services is becoming increasingly relevant. For us, it is clear that we will support our customers on their path towards sustainability. In our function as a financier of the real economy, we always view the sustainable finance topic from a holistic perspective. This also includes those clients who are still at the beginning of their transformation process.

In addition, the EU taxonomy will also shape the labelling of our sustainable financial products. We assume that taxonomy-compliant products will develop an important signalling effect for market participants."

– Sabrina Nickel, DZ Bank



6. Outlook: upcoming challenges

- The NZBAG will address the operational challenges of implementing the German financial sector's voluntary climate commitment until the end of 2022.
- A key focus will be on enhancing dialogue between the banking sector and the real economy, particularly SMEs.
- The NZBAG welcomes collaboration with other initiatives and inputs from technical experts.

The NZBAG aims to support the German banking market in implementing the voluntary climate commitment and harmonising climate action. Their work will be crucial to positioning the German banking sector as a strong partner of the real economy in the climate transformation. The NZBAG aims to tackle the following challenges in a pre-competitive setting:

- **Link between portfolio steering and client dialogue:** client dialogue is one of the most effective ways for banks to advance climate action. Banks can benefit from having a macro perspective on climate transformation as they can use it to advise clients and develop solutions for and in collaboration with their clients. Upskilling of staff, development of engagement tools, and introducing incentive systems will ensure that banks strengthen their capacity as an effective partner of the real economy in the climate transformation. Until the end of 2022, the NZBAG aims to develop a pre-competitive engagement tool to harmonise systematic client engagement, introduce minimum standards for climate-related training curricula, and develop guidance on incentive systems in line with the voluntary climate commitment.
- **Development of a solid data environment:** access to data remains a key challenge for banks implementing the voluntary climate commitment. The German economy benefits from a strong SME segment and the Mittelstand, which are largely bank financed. So far, fewer disclosure requirements and higher transaction costs for SMEs to collect climate-related data lead to a more fragmented data environment. Banks will need to work with SMEs to close data gaps. The NZBAG aims to support the process by developing a pre-competitive client engagement tool, exchanging data needs with the Financial Big Data Cluster project,[48] and facilitating a structured dialogue with the real economy.
- **Digitalisation of climate action:** digitalisation is necessary to process the higher volumes of data required for Paris-aligned portfolio steering and subsequent modelling. While many challenges are specific to banks' IT systems, the NZBAG aims to support harmonising digital solutions in the German banking sector, facilitating pre-competitive expert exchanges on challenges and solutions between its members, and enabling the integration of ML and AI methods in cooperation with the Financial Big Data Cluster project.

48 For further information, see: Federal Ministry for Economic Affairs and Energy, "Financial Big Data Cluster (FBDC)".

- **Steering different lending instruments in line with the Paris climate goals:** the characteristics of lending instruments differ. The NZBAG aims to assess the respective impact on Paris-aligned portfolio steering and, where useful, provide guidance on Paris alignment for different lending instruments in loan portfolios. In this context, the discussion will likely focus on the challenges involved with revolving credits or continuous working capital financing.

The NZBAG aims to avoid duplication in methodologically implementing climate action in the German banking sector. The NZBAG welcomes the work of other initiatives and projects and seeks exchange, including with:

- Pathways to Paris (PtP) project by WWF Germany and PwC Germany;
- UNEP FI Net Zero Banking Alliance and other UNEP FI initiatives;
- Paris Agreement Capital Transition Assessment (PACTA) for banks;
- Science-based Target Initiative for Financial Institutions (SBT FI);
- Partnership for Carbon Accounting Financials (PCAF), facilitated by VfU in Germany;
- Financial Big Data Cluster (FBDC) coordinated by the Frankfurt School of Finance & Management;
- Task Force on Climate-related Financial Disclosures (TCFD); and
- TCFD Think Tank by the Green and Sustainable Finance Cluster Germany.

The NZBAG also seeks exchange with its European peers, including the Green Finance Institute (United Kingdom), Nederlandse Vereinig van Banken (the Netherlands), and Finresp (Spain).

> **"Regulation, the interest level and Cost-Income-Ratio are the key challenges in the next years in the market. Automatisation will be a big tackle and potential to fulfill the goals of our sustainability strategy. Most important is the question: Why do I do this? To become compliant or to create business cases?"**
>
> – Dr. Gerrit Mumm, DKB

German banks will need to make substantial progress on implementing the voluntary climate commitment until the end of 2022. The members of the NZBAG and its secretariat are committed to developing pre-competitive solutions. However, a joint effort beyond the working group of the NZBAG is necessary for it to be efficient and effective. The NZBAG invites other banks to join its work, other initiatives to engage in active exchange, the real economy to enter a dialogue on joint solutions, and policymakers to discuss an ambitious and supportive policy environment.

Please get in touch with us.

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List of abbreviations

AI	Artificial Intelligence
B2DS	Beyond 2°C Scenario
BECCS	Bioenergy and Carbon Capture and Storage
CAPI	Climate Action Portfolio Indicator
CASI	Climate Action Sector Indicator
CCS	Carbon Capture and Storage
CH4	Methane
Cluster	Green and Sustainable Finance Cluster Germany
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DAC	Direct Air Capture
EBA	European Banking Authority
EPC	Energy Performance Certificate
EU	European Union
EV	Electric Vehicle
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GWP	Global Warming Potential
HFC	Hydrofluorocarbon
IAM	Integrated Assessment Model
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
KPI	Key Performance Indicator
kWh	Kilowatt Hour
LULUCF	Land Use, Land Use Change and Forestry
ML	Machine Learning
N_2O	Nitrous Oxide
NGFS	Network for Greening the Financial System
NZBAG	Net Zero Banking Alliance Germany
NZE	Net Zero Emissions
PACTA	Paris Agreement Capital Transition Assessment
PCAF	Partnership on Carbon Accounting Financials
PtP	Pathways to Paris
PwC	PricewaterhouseCoopers
RCP	Representative Concentration Pathway
SBT FI	Science-Based Target Finance Initiative
SDG	Sustainable Development Goal
SDS	Sustainable Development Scenario
SME	Small and Medium-Sized Enterprise
SSP	Shared Socioeconomic Pathway
TCFD	Taskforce on Climate-related Financial Disclosures
UBA	Umweltbundesamt
UNEP FI	United Nations Environment Programme Finance Initiative
UTS	University of Technology Sydney
VfU	Verein für Umweltmanagement und Nachhaltigkeit in Finanzinstituten
WWF	World Wide Fund for Nature

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Antitrust Guidelines

The Green and Sustainable Finance Cluster Germany e.V. ("the Cluster") is a platform that brings together stakeholders from the private and public finance sector, regulators, policymakers, NGOs, and academia. The Cluster supports the NZBAG with basic research and coordination to develop methods and processes to fulfil the Climate Self-Commitment of the Financial Sector.

The following antitrust guidelines are to be followed in the Cluster's activities. The Cluster's guidelines follow Article 101(1) of the Treaty on the Functioning of the European Union (TFEU) and Section 1 of the Act against Restraints of Competition (GWB).

"The positioning of Frankfurt as a financial center focused on climate-friendly and sustainable financial investments" as well as "the formation of a network [...] in which expertise regarding financial and risk issues related to sustainable and climate-related financial products is bundled" is the statutory purpose of the Cluster. This purpose is fulfilled by the constitution and subsequent basic research of the NZBAG on decarbonisation at the interface of (real) economy and banks. The aim of the antitrust guidelines is to prevent behaviour that could potentially lead to market distortion with respect to innovative technologies and companies or to a reduction in pressure to innovate.

Within the scope of the NZBAG's activities, only activities that are pre-competitive and comply with the rules of the German Federal Ministry for Economic Affairs and Energy for the promotion of joint industrial research are undertaken. In this context, the entire financial sector is expected to benefit from this.

All official meetings of NZBAG-related activities shall be attended by an employee of the Cluster or, in individual cases, a comparably trained substitute. The employees shall, together with all participating companies and individuals, ensure compliance with antitrust rules.

Discussions within the NZBAG shall only take place regarding the research project. There shall be no exchange or coordination between the participating financial institutions about:

- A possible individual and concrete utilisation of the results of the individual research projects, e.g., the transfer of findings and knowledge into products or processes relevant for competition.
- Confidential information on the activities of the participating companies; as opposed to information that is generally known to the public.
- Costs of research projects if they were carried out by the companies themselves.
- Individual technical know-how of a company that is not generally known (secret) and essential, and that is relevant for the further development or exploitation of the presented research results.
- Potential or planned own research and development of the respective companies, which builds on the presented results, as well as own comparable research.
- A limitation of a company's own research and development in an area outside the specific research project, as well as a limitation of a company's own research and development in the area of the specific research project after its completion.
- Aspects that would provide competitive advantages to a single company or multiple companies.
- The adaptation and competitive implementation of the results in products, processes or services takes place in the companies following the project.
- Disclosure of the results of the NZBAG's work, e.g., via publications and specialist conferences is planned beyond the group of participants.

Within the framework of the NZBAG, there must – of course – be no exchange or agreements on topics that are illegal under antitrust law.

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