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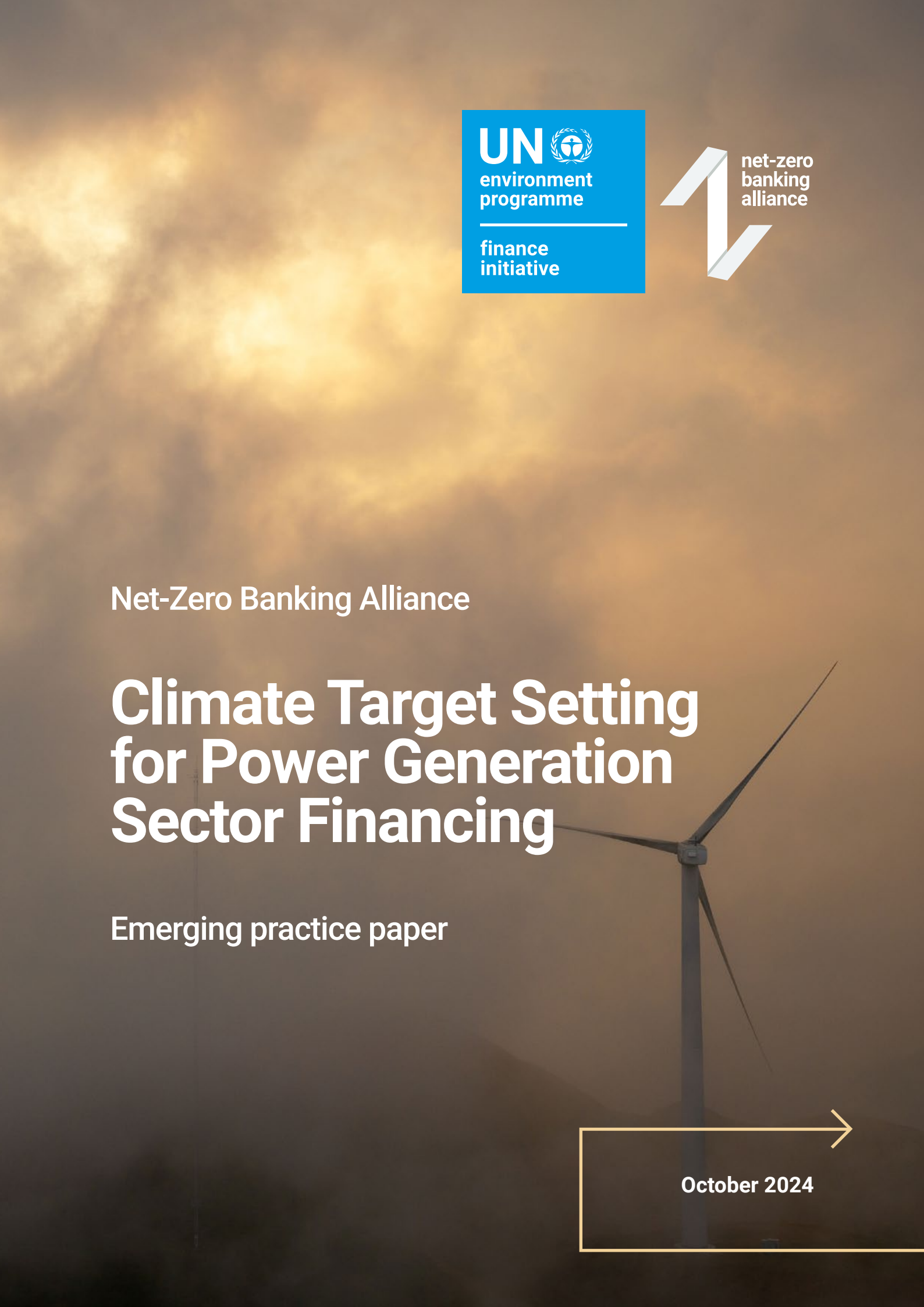
Net-Zero Banking Alliance

Climate Target Setting for Power Generation Sector Financing

Emerging practice paper



October 2024

Disclaimer

The content and guidance set out in this paper do not constitute advice to members of the Net-Zero Banking Alliance (the Alliance). Further, any views expressed in this paper do not necessarily represent the views of each individual member, including those in the relevant working group that assisted in the preparation of the paper. This paper is intended as a general guide for "effective practices" and is not prescriptive as to actions or decisions to be taken by members. The members of the Alliance set individual targets and make their own unilateral decisions. The use of papers and guidance, including the scope of participation in the Alliance, is at the discretion of each individual member. As such, the Alliance takes no liability for actions or decisions taken by members when applying the principles in this paper. Any references to external frameworks or organisations should not be considered as an endorsement of that organisation or their work.

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Purpose of the publication

This sector-specific analysis for the power generation sector is part of a series developed by members of the Net-Zero Banking Alliance (NZBA) with the purpose of outlining the choices available to banks when setting climate-related targets in particular sectors of the real economy. This series identifies emerging practices and approaches to establishing emissions targets for bank financing, while also identifying prevailing trends, common challenges and desired policy, or data refinements..

The overarching goal of this analysis is to assist NZBA members in formulating or refining their own targets towards net zero emissions. It does not impose new requirements on NZBA member banks over and above the ones they chose to commit to when becoming a signatory and is not prescriptive in terms of specifying when and how they are expected to decarbonise their sector-specific lending and investment portfolios. Due to the fast-paced environment characterised by rapidly evolving scenarios, pathways, scientific advancements and developments in the real economy, this publication should be regarded as a review of current practices.

This sector-specific publication will focus on providing the baseline information banks can use when actively steering their portfolio towards emission reductions in the power generation sector. This paper focuses on decarbonisation and does not consider other important environmental and social issues.

Acknowledgements

This publication was written, compiled and edited by representatives of the UN Environment Programme Finance Initiative (UNEP FI), which hosts the secretariat of the Net-Zero Banking Alliance (NZBA).

The document reflects the work of the NZBA Power Generation Working Group and consultations with more than 20 other banks, NGOs and industry stakeholders. Representatives from City Bank led the work with support from the NZBA Secretariat.

The Secretariat would like to thank all representatives from the working group, members who contributed their technical review, including City Bank, Crédit Agricole CIB, Standard Chartered Bank, as well as external stakeholders who provided sectoral insights, including Ceres, the Energy Transition Comission, and the TPI Centre at the LSE Grantham Research Institute.

About the Net-Zero Banking Alliance

The bank-led, UN-convened Net-Zero Banking Alliance (NZBA) brings together a global group of banks that are voluntarily committed to independently aligning their financing activities with pathways to net zero emissions by 2050 in line with limiting global warming to 1.5°C.

Combining near-term action with accountability, this ambitious commitment sees signatory banks setting intermediate targets for 2030 or sooner using robust, science-based guidelines.

NZBA is the flagship climate initiative under the Principles for Responsible Banking to accelerate science-based climate target setting and develop common practice. NZBA is the global banking alliance within the Glasgow Finance Alliance for Net Zero (GFANZ) and is open to all banks globally, including banks that are not UNEP FI members or Principles for Responsible Banking signatories.

The Alliance reinforces and supports the implementation of decarbonisation strategies, providing an internationally coherent framework and guidelines in which to operate. It recognises the vital role of banks in supporting the global transition of the real economy to net zero emissions.

The Alliance is convened by the UN Environment Programme Finance Initiative. Learn more here: unepfi.org/net-zero-banking/

Abbreviations and acronyms

AEMO	Australian Energy Market Regulator CCC: Climate change committee
CCC	Climate Change Committee
CCGT	Combined Cycle Gas Turbine
CDP	Carbon Disclosure Project
CH_4	Methane
COD	Commercial Operation Dates
EEA	European Environment Agency
EIB	European Investment Bank
EPA	Environmental Protection Agency
EVIC	Economic Value Including Cash
GCAM	Global Change Analysis Model
GFANZ	Glasgow Financial Alliance for Net Zero
GHG	Greenhouse Gas
IEA NZE 2050	International Energy Agency Net Zero Emissions by 2050 Scenario
IRENA	International Renewable Energy Agency
IPCC	Intergovernmental Panel on Climate Change
ISSB	International Sustainability Standards Board
N_2O	Nitrogen Oxide
NGFS	Network for Greening the Financial System
NRCan	National Resources Canada
NZBAF	Net-Zero Banking Assessment Framework
OECD	Organisation for Economic Cooperation and Development
OECM	One Earth Climate Model
PACTA	Paris Agreement Capital Transition Assessment
PAT	Portfolio Alignment Team
PCAF	Partnership for Carbon Accounting Financials
SBTi	Science Based Targets initiative
SDA	Sectoral Decarbonisation Approach
Sida	Swedish International Development Cooperation Agency
TPI	Transition Pathway Initiative
UNEP FI	UN Environment Programme Finance Initiative
WBCSD	World Business Council for Sustainable Development

Contents

Summary

Design Choices	Element	Power Generation
Sector Scoping	Financial products	Banks can set targets across their loan books as well as capital market activities (e.g. arranging and underwriting). Common financial products that are considered by banks include general corporate finance.
	Sector activities	Banks tend to set targets for power generation activities only, excluding transmission, storage or distribution activities. Thus, the paper focuses on electricity generating activities only, excluding e.g., for example, technical considerations for combined heat and power.
	Emissions	Emissions coverage can include operational emissions of power generation companies (Scope 1 or Scope 1 and 2), as well as upstream and downstream emissions (Scope 3).
Target-setting metrics and data	Metric Type	NZBA guidelines direct banks to set financed emissions targets using absolute emissions metrics (such as annual tCO_2e) or emissions intensity metrics based on an activity (CO_2/kWh).
	Attribution Approach	Two broad attribution approaches are available to banks: the balance sheet approach and the portfolio weight approach.
	Data	Banks have several data sources available, including client reports, Asset Impact, S&P Global Trucost Intelligence, client reporting, and CDP disclosures among others.

Design Choices	Element	Power Generation
Pathways	**Scenario Choice**	NZBA guidelines direct member banks to use widely accepted, science-based decarbonisation scenarios to guide them when setting individual long-term and intermediate targets that are aligned with the temperature goals of the Paris Agreement. In addition, per the guidelines, "scenarios selected shall be 'no overshoot' or 'low-overshoot' scenarios," and should have a greater than 50 per-cent probability of limiting global warming to 1.5°C by the end of the century. Scenarios discussed in this paper are the International Energy Agency's Net Zero Emissions by 2050 scenario (IEA NZE 2050), the Network for Greening the Financial System (NGFS) Net Zero scenario and Sectoral Decarbonisation Approach (SDA) from the Science Based Targets initiative (SBTi). However, other 1.5°C scenarios and pathways exist (e.g. One Earth Climate Model).
	Benchmark Pathway	Three approaches are available to design the benchmark pathway: ▪ Convergence approach: implies that all counterparties converge to net-zero-aligned industry-average emissions intensity levels. ▪ Contraction approach or rate-of-reduction: implies that all counterparties reduce emissions at the same net-zero-aligned, industry-average rate, irrespective of their current and past performance. ▪ Fair share approach: defines the average rate of reduction in absolute emissions for an industry but recognises that individual counterparties may be better- or worse-performing than average.

1. Introduction

In this document, the Net-Zero Banking Alliance (NZBA) considers various approaches banks have used to set their individual net-zero targets for their power generation portfolios.

The publication was developed by the NZBA working group comprised of NZBA member banks who have already set, or are currently developing, their own individual net-zero target for the power generation sector. The work conducted can be seen as complementary to the energy (oil and gas) emerging practice paper published by the NZBA. The working group's analysis was structured along six building blocks, as seen in Figure 1, which forms the basis of this document.

Banks setting net-zero targets for the power generation sector will make critical design choices to appropriately scope their approach, including:

- **Financial scope:** Determining the products/activities most commonly provided to the power generation sector
- **Sector activities:** Limiting the activities in the sector that are in scope
- **Greenhouse gas emissions and scope:** Identifying the diverse sources of emissions within the power generation sector
- **Establishing metrics and methods for target-setting:** Banks select metrics and methodologies to measure progress and individually set ambitious targets in line with global climate objectives
- **Accessing relevant data sources:** Banks utilise sector-specific and regional data sources to inform target setting and decision-making
- **Selecting 1.5°C scenarios and pathways:** Banks gain insights into strengths and gaps of prominent pathways that guide the power generation sector's alignment with the 1.5°C target

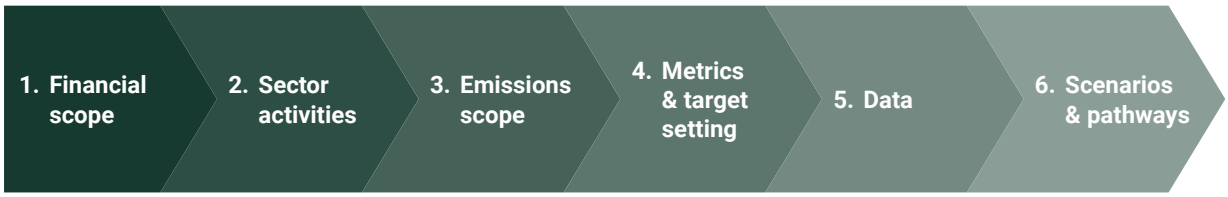

Figure 1: The six building blocks considered by banks through the target setting process

Recognising the significant regional variations in energy mix and regulations, reporting requirements, data availability, and associated infrastructure in the different countries in which NZBA member banks operate, this publication aims to provide a nuanced understanding of the multiple factors influencing a bank's assumptions underlying a bank's net-zero targets.

The following information is not exhaustive, and banks must navigate data limitations at both the collateral and scenario levels by relying on the availability of national data and regional scenarios. In addition, the NZBA recognises that approaches to bank target setting in various sectors continue to evolve. As a result, this document is a point-in-time assessment.

While this publication focuses on decarbonisation and does not include other environmental, social or governmental aspects, banks need to consider the implications and clients' ongoing access to financing when steering their portfolios. Adhering to these principles will also help avoid the creation of stranded assets by adapting to changes, such as shifts in regulatory or environmental policies, as well as avoiding investments in assets that later are more likely to become non-viable or obsolete.

Importantly, the paper is designed to complement the NZBA's Guidelines for Climate Target Setting for Banks and does not prescribe any specific methodologies for banks to adopt. It is essential, however, that any action taken based on information in this publication to fulfil a bank's NZBA commitment should adhere to all provisions of the guidelines, including that any action taken by a bank must be taken on an individual basis. Moreover, national laws and regulations should take precedent.

2. Understanding the power generation sector

2.1 Greenhouse gas (GHG) emissions trajectories and net-zero requirements for the sector

The overhaul of the energy system is pivotal for worldwide climate mitigation efforts. With power generation being responsible for 36 per cent of global energy-related CO_2 emissions (IEA 2023), primarily from the combustion of fossil fuels, its transformation has far-reaching implications for other high-emitting sectors.

Electricity demand is on an upward trajectory globally,[1] presenting both hurdles and opportunities for technological innovation. It has seen a steady rise, with a 2.5 per-cent annual growth in 2023 and an expected growth of four per cent in 2024 (IEA 2024a, IEA 2024b). Despite this, electricity demand growth in most regions has been subdued due to record-high energy prices and economic slowdowns in recent years. Soaring prices for energy commodities, including natural gas and coal, have sharply escalated power generation costs and fuelled rapid inflation. High energy prices in 2022, primarily due to the cost of natural gas and coal, led to economic slowdowns and inflation but also spurred a shift in energy production methods (IEA 2023).

As electricity demand continues to rise, the decarbonisation of the power sector becomes ever more imperative as other sectors are electrifying to decarbonise. The electrification of transport and heating sectors continues to accelerate, underpinned by significant milestones, such as record sales of electric vehicles and heat pumps in 2022.

The net-zero economy foresees greenhouse gas emissions from electricity generation falling to zero in advanced economies in the 2030s and in emerging market and developing economies around 2040. Renewable and nuclear energy are anticipated to provide more than 90 per cent of new global electricity demand over the next three years, facilitated by falling costs and supportive policies (SBTi 2020, IEA 2024a).

To meet Intergovernmental Panel on Climate Change (IPCC) recommendations, the sector's emissions must be reduced by 70–92 per cent between 2020 and 2035, reaching near-zero levels by 2040–2045 (IPCC 2018).

1 In some industrialised countries, such as France or Germany, electricity demand has slowly been decreasing over the last decade largely due to energy efficiency and deindustrialisation (see ember-climate.org/data/data-tools/data-explorer/).

Factors such as rapid technology cost reductions for solar, wind and storage, the growth of enabling conditions from national and subnational goals, and the increasing demand for renewable electricity are making it possible for the power sector to decarbonise and will continue to be critical enablers in the coming decades (SBTi 2020).

Achieving net zero by 2050 in line with the guidelines of the Network for Greening the Financial System would necessitate an annual investment of roughly USD 1 trillion in power generation, USD 820 billion in grid infrastructure, and an additional USD 120 billion in energy storage from 2021 to 2050 (McKinsey 2022).

This complex transition is not merely about reducing emissions but also involves technological and regulatory changes. Financial institutions are navigating these multifaceted elements when setting their net-zero targets.

2.2 Decarbonisation strategies of the power generation sector

For the decarbonisation and transition of the power generation sector, banks have several technological options to achieve their net-zero targets. The NZBA maintains a technology-neutral position, yet it recognises the varied approaches that banks may adopt within their net-zero investment frameworks.

To align with the IEA's net-zero emissions scenario by 2050 for a 1.5°C global temperature stabilisation, global investment must increase significantly by 2030. The areas for investment to support the transition to net zero are specific to the regional context but could include:

- Investments in renewable energy projects such as wind farms, solar parks and hydroelectric facilities
- Investments in the development and deployment of nuclear power plants where considered a low-carbon option
- Supporting infrastructure critical to the power sector, including advanced battery technologies and storage systems
- Supporting the expansion and modernisation of electrical grids to accommodate increased renewable capacity
- Developing energy efficiency projects that reduce power consumption and improve generation efficiency

Technological advancements, regulatory reforms and significant investments in grid maintenance and energy storage are key to supporting the sector's transition. Challenges can include the grid integration of intermittent renewable sources and effective demand management.

Although investments in transmission and distribution are a backbone of the energy transition, most banks currently do not consider them in their sector target. This may need to change in future.

Energy production: Role of heat in power generation for net-zero targets

Power generation converts energy sources into electricity and is central to energy production. Heat generation, which is both released as a by-product and a vital factor in the power generation process, is of equal importance. Some banks consider including heat in their power generation net-zero target, particularly in regions with a cold climates.

Heat generation encompasses a range of methods including fuel combustion (coal, oil, natural gas, biomass), electrical resistance, solar thermal and geothermal sources. Power generation technologies include thermal power plants, hydroelectric dams, wind turbines, solar photovoltaics, geothermal power plants and tidal and wave energy converters. In some regions, heat and power are a cornerstone of a national strategy to reduce coal-fired district heating.

Combined-heat-and-power and waste-to-energy systems can increase efficiency of power generation. Incorporating those into a bank's net-zero targets allows for a more comprehensive approach to energy generation and sustainability by considering both heat and power components. By specifically including heat in the target, banks can encourage innovation in renewable heating technologies as well.

However, integrating heat into a net-zero target adds complexity due to the need to consider various energy sources, technologies and applications in the analysis. When setting targets with heat, it is necessary to take into account factors such as the scope of emissions, measurement methodologies, technological considerations, geographical and sectoral variations, timeframes for decarbonisation, varying regulatory environments, stakeholder engagement and financial implications. Further methodologies are required to efficiently consolidate greenhouse gas accounting principles.

Biomass

Biomass is one of the renewable technologies that could be considered and included in a bank's analysis. Biomass encompasses organic materials from living organisms, such as plants, animals and microorganisms, that are used as energy sources, converting to electricity, heat or biofuels (i.e. bioenergy). Common technologies for harnessing bioenergy include direct combustion, biochemical conversion and thermochemical methods. Jurisdictions differ in how they categorise biomass—while some focus on agricultural residues, others emphasise energy crops.

Banks need to consider diverse regulatory treatments of biomass, influenced by the applied technologies, regional policy priorities and legislative nuances. Its perceived carbon neutrality can be an asset, but only if sourced sustainably.[2]

2 While a unified definition of sustainably sourced biomass does not yet exist, some characteristics can be identified: a low lifecycle of GHG emissions, reasonable opportunity costs for carbon sequestration, avoidance of land competition for food production, prevention of land use changes that release carbon stocks (especially deforestation), and minimal impact on biodiversity. For additional information see (ETC 2021).

A point of contention can be the carbon accounting associated with biomass which has been a subject of ongoing debate within the scientific community. The growth-to-combustion cycle of biomass absorbs during the growth phase and then releases CO_2 upon its combustion, which has led to its characterisation as carbon-neutral. However, there are discrepancies in accounting for the full spectrum of emissions linked to activities in the biomass value chain, such as deforestation, which introduce additional emissions. These emissions are not fully captured or accurately represented in standard accounting methods.[3]

Opportunities exist to refine methodologies and enhance alignment to include biomass accordingly.

2.3 Considerations for developed and developing nations

Banks operating in Organisation for Economic Co-operation and Development (OECD) and non-OECD countries encounter unique market, ecosystem and information challenges that are pertinent to the distinct energy profiles, market realities and regulatory landscapes of each area.

In many non-OECD countries, the energy mix is often less diverse, with a pronounced reliance on fossil fuels for power generation. This can hinder swift transitions to cleaner alternatives, and the power infrastructure might be less mature, requiring significant investments in renewable energy technologies and grid enhancements. Dynamic energy demand patterns in these economies, driven by industrial growth, population increases, urbanisation and other factors, call for flexible scenarios. These must align with specific energy needs, including considerations beyond emission intensity, such as energy access, electrification rates and a just transition[4] to address energy inequality. The limited data availability in developing countries can make planning and managing energy supplies complex, and banks may struggle with modelling dynamic climate relationships due to missing region-specific scenarios.

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3 While the CO_2 absorption and release may balance each other out, there are other non-CO_2 greenhouse gases, such as methane (CH_4) and nitrous oxide (N_2O), that are also released during the combustion of biomass. These gases have significantly higher global warming potentials compared to CO_2, and their contributions to the overall greenhouse gas emissions from biomass would need to be accounted for in terms of their CO_2 equivalence to provide a realistic assessment of the environmental impact of biomass utilisation.

4 Additional sources for banks to investigate just transition implications include:

- Just Transition Finance Tool developed collaboratively by the International Labour Organization (ILO) and the London School of Economics (LSE) Grantham Research Institute for Climate Change and the Environment, with conceptual and technical support provided by Steward Redqueen and financial support by the Swedish International Development Cooperation Agency (Sida): ilo.org/sites/default/files/wcmsp5/groups/public/@ed_emp/documents/publication/wcms_860182.pdf
- Transition Pathway Initiative's (TPI) Net Zero Banking Assessment Framework (NZBAF) has a dedicated area focusing on assessing whether banks have committed to decarbonising in line with defined Just Transition principles, recognising the social impacts of their decarbonisation efforts; and whether they have disclosed actions taken to ensure relevant Just Transition considerations are incorporated in their climate strategies (e.g. Just Transition-related requirements in lending covenants and conditions, pre-investment screening and sector policies).

In developed countries, banks face different opportunities and challenges, with an established power infrastructure that often includes a mix of renewable and non-renewable energy sources. The focus may be on transitioning from existing power generation methods to low-carbon technologies, aligned with international climate agreements and supported by reliable datasets for target setting.

Challenges shared by both developed and developing regions, especially concerning data availability, emphasise the crucial role of technology and data analytics in evaluating and mitigating climate risks. Ecosystem support varies across regions but is generally broad and multifaceted, influenced by climate agreements, investor interests and public enthusiasm for clean energy.

The ecosystem factors that prevent or support banks in setting net-zero targets in the power generation sector vary between developing and developed countries. Developing countries may face challenges in accessing finance and dealing with policy barriers, while developed countries might encounter obstacles related to transitioning established industries and slow policy implementation. However, both contexts benefit from ecosystem support in the form of international assistance, technological advancements, green finance initiatives, and climate commitments that can bolster banks' efforts in achieving net-zero targets.

3. Design choices for scoping the sector

3.1 Scoping financial products

The NZBA guidelines require banks to "apply to the bank's lending, investment activities and capital market activities (Scope 3, Category 15[5] emissions)." (NZBA 2024, p. 4)

Banks' scope of financial products in their target setting can include general-purpose financing to utilities, asset or project financing that is beyond traditional green financing, such as renewables lending and green bonds, as well as capital market activities, particularly debt and equity capital market transactions for public companies (e.g. arranging and underwriting).[6] General-purpose loans are a type of loan that is not specifically earmarked for a particular purpose or use. In contrast, asset financing is focused on financing specific assets (such as power plants) and relies primarily on their value as collateral, while project financing is centred around funding long-term (industrial or infrastructure) projects and assesses a project's financial viability. In addition, project financing is typically non-recourse through a special purpose vehicle meaning lenders have in case of a defaulted loan only limited or no claims against the assets of the borrower other than the project's assets.

Banks are advised to account for comparability, purpose and timeframes[7] when selecting financial products as these factors may variably affect the greenhouse gas emission baseline, as well as its reduction potential.

Challenges specific to corporate financing and project financing will be highlighted where deemed relevant throughout the paper.

5 The Greenhouse Gas Protocol (2020, p.137) includes equity investments, debt investments, project finance and managed investments as well as client services under Scope 3, Category 15.

6 According to BloombergNEF (2023), banks globally underwrote USD 1.7 trillion of energy supply transaction activity in 2021 (USD 708 billion for low-carbon energy and USD 967 billion for fossil fuels), of which, USD 1.5 trillion went to capital underwriting and USD 0.2 trillion to project finance and tax equity.

7 Timeframes are related to the length of the financial product. For example, short-term loans often cover short-term capital requirements with very limited potential for steering emissions reduction.

3.2 Scoping the sector value chain

The power generation sector encompasses industry companies and activities focused on:

- Utilities generating electricity
- Operating transmission and distribution lines of produced energy across a network
- Storing electricity where needed
- Supplying electricity to the market

Figure 2 sets out the sector's activities and its value chain. Power generation clients can encompass electric or integrated utilities, power plants, independent power producers or renewable electricity producers. A key characteristic of this industry is its diverse ownership structure, which, regardless of region, includes state-owned enterprises and natural monopolies alongside private market operators. This variance is especially pronounced in segments such as wholesale and trading, where the spectrum of ownership extends from fully state-controlled to entirely private entities.

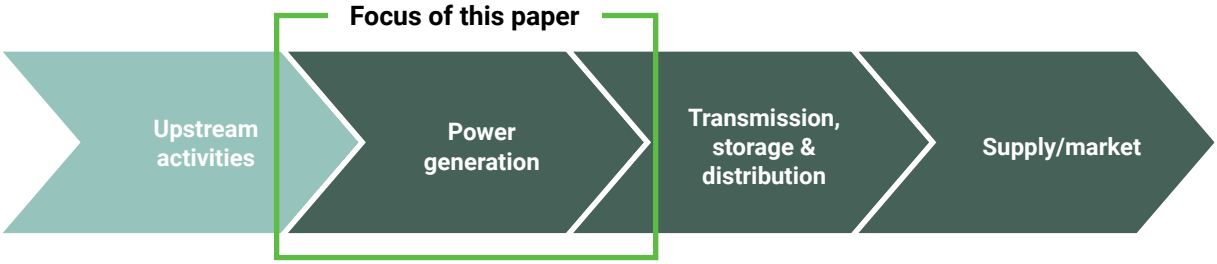


Figure 2: Power generation sector's activities and value chain

It should be noted that upstream activities such as oil and gas exploration, processing, and coal mining provide inputs for power generation and are often addressed alongside it by banks through "energy" targets. These sectors are subject to distinct emissions reduction pathways and timelines. Providing separate targets allow banks to have greater monitoring and steering control over their progress. When setting energy and power generation targets, banks should be mindful of double counting emissions. Therefore, the analysis of oil and gas related activities, including transmission, distribution, retailing or even LNG, are outside the scope of this paper.

3.3 Emission boundaries

An important consideration for banks is deciding which scope of emissions should be considered eligible for their target setting. The NZBA guidelines recommend that, "banks' targets shall include their clients' Scope 1, Scope 2, and Scope 3 emissions, where significant and where data allow. Coverage is expected to increase between each review period […] The approach to significance shall be explained and may refer to a recognised methodology" (NZBA 2021a).

Direct emissions for power generation come from the combustion of a range of energy sources such as fossil fuels (coal, natural gas and oil), and renewable resources

(geothermal or bioenergy).[8] Meanwhile, indirect emission can occur with nuclear or renewable sources (solar, wind, hydro) through upstream production suppliers.

The highest level of emissions is currently associated with **Scope 1** of power generation companies, which represents direct emissions from owned or controlled power plants. This includes emissions from burning fossil fuels such as coal, oil or natural gas in their power plants to generate electricity. According to banks' disclosures, these constitute up to 95 per cent of the emissions of power generation utilities.

Scope 2 are indirect emissions from the generation of purchased energy used by the power generation companies. This could involve emissions from purchased electricity,[9] steam, heating or cooling that the energy companies use in their operations. They usually comprise a small share of a company's emissions profile and relate to energy used to operate power plants that cannot be isolated from the overall industry electricity consumption.

Scope 3 emissions of power generation companies include emissions generated from customer use of natural gas for those companies with a natural gas distribution line of business.

Scope 3 emissions (upstream) include emissions from power that is purchased from wholesale suppliers that is then sold to a utility's customers. The portion of emissions attributable to Scope 3 is highly dependent on the individual company and the region in which it operates and has the potential to be high. In some jurisdictions, such as the United States, Scope 3 emissions account for the majority of the sector's emissions.[10]

In cases where banks finance electricity utility companies with more diverse production profiles, such as those also active in the distribution or retailing of electricity generated by other companies or in gas distribution, setting Scope 3 targets might be considered. These companies are exposed to transition risks from natural gas retailing and high emissions electricity purchases, respectively (Categories 11 and 3). In such cases it is advisable for both real economy companies and banks to also set separate targets for electricity generation and other activities to maintain consistency across companies as well as sectoral benchmarks.

Overall, emissions can be difficult to measure due to the wide range of activities involved in the clients' value chain and because there is no agreed approach to aggregate cross-sectoral emissions without the risk of double-counting.

The scope of economic activities may overlap when setting targets for both power generation (Scope 1) and oil and gas (Scope 3 downstream). When designing targets, addressing potential double-counting of emissions is part of the target-setting process.

8 NZBA is technology neutral. The selection of the appropriate technology is solely dependent on regional regulations as well as regional climate scenarios and pathways.

9 Scope 2 includes emissions used to operate power plants and office buildings. This is not to be confused with emissions from purchased energy that is ultimately sold by power generation companies. Emissions from energy that is purchased and sold are accounted for in a power company's Scope 3 (upstream). Scope 2 emissions .usually comprise a small share of power generation companies' emissions profile.

10 For additional information, see: spglobal.com/commodityinsights/en/market-insights/latest-news/natural-gas/032922-feature-us-power-utilities-begin-adding-scope-3-emissions-to-climate-goals

Table 1: Exemplary overview of applicable emissions from power generation companies (adjusted from the World Business Council for Sustainable Development [WBCSD] 2020)

Scope 2 ▪ Purchased energy (electricity, heating and cooling) used in offices and data centers ▪ Auxiliary electricity consumption ▪ T&D losses (only for utilities with a T&D business, excludes electricity generated by own facilities) **Scope 3** ▪ Purchased non-energy goods & services (cat. 1) ▪ Extraction and processing of natural gas purchased for retail (cat. 1) ▪ Construction of new plants (cat. 2) ▪ Extraction and process of fuels for generation (cat. 3) ▪ Generation of electricity traded or purchased/sold for retail (cat. 3) ▪ Transport of fossil fuels to power plants (cat. 4)	**Scope 1** ▪ Combustion of fossil fuels for power generation	**Scope 3** ▪ Use of solid natural gas (cat. 1) ▪ Equity investments in fossil fuel plants (cat. 15)
Upstream activities (suppliers)	**Electric utility**	**Downstream activities (customers)**
Scope 2+3—Upstream	**Scope 1**	**Scope 3—Downstream**

Annex A provides more detailed analysis of the materiality and ability to control Scope 3 emissions by a power generation utility.

Emissions linked to other residential, commercial or industrial high-emitting sectors, such as real estate, manufacturers and transportation, are indirect emissions to utilities (Scope 3 downstream) and can be addressed in separate sectoral targets to avoid double-counting of emissions.

Emissions from transmission, storage[11] and distribution mainly stem from inefficiencies leading to losses. While these sectors currently have a minimal impact on emissions, investing in them is critical for enhancing their functionality and ensuring they can handle the increased adoption of renewable energy sources.

Emissions in the power generation sector are mainly generated through the combustion of fossil fuels—particularly coal, oil and natural gas—releasing carbon dioxide (CO_2)

11 Batteries can fulfil the role of energy transmission as well as power generation. The challenges linked to this are excluded from the analysis in this paper. By storing power, batteries allow for more power to be generated when it is combined with other renewable sources. Future methodology developments will improve the accuracy of greenhouse gas accounting.

and other greenhouse gases, such as methane (CH_4) and nitrous oxide (N_2O). CO_2 is the predominant greenhouse gas emitted, and the contribution of non-CO_2 gases like methane (CH_4) and nitrous oxide (N_2O) varies based on specific factors such as the type of fuel used, technology employed,[12] and operational conditions. In addition, regulation may inform a bank's decision whether to focus on CO_2 or CO_2e emissions in their targets. Both the European Union and the United States target all greenhouse gases in their reduction targets by 2050, whereas China's net-zero plan focuses on balancing only CO_2 emissions by 2060.

Scope 3 emissions and life-cycle assessments

As the power generation sector decarbonises and adopts net-zero or low-carbon technologies, scope 3 and life-cycle emissions will become increasingly relevant, both upstream (e.g., raw material extraction and fuel transport) and downstream (e.g. use of energy by consumers).

Scope 3 and life-cycle emissions overlap in several areas, as they both encompass emissions from the production, usage and disposal of energy. Both categories include emissions from purchased goods and services, transportation and distribution (upstream), waste generated in operations, business travel, employee commuting and the use of sold products and services (downstream).

However, Scope 3 emissions have a broader focus on indirect emissions throughout a company's value chain, including some sources not typically considered in life-cycle assessments, such as emissions from investments and the processing of sold products by third parties. In contrast, life-cycle emissions cover the entire lifespan of a product or service, which includes emissions from raw material extraction, product manufacturing, transportation of raw materials to manufacturing sites and product disposal or recycling.

To calculate a technology's life-cycle emission, the emission intensity of each technology will be critical to the calculation. By evaluating the emission intensity of different energy technologies, power generation companies can prioritise the most efficient and low-carbon technologies to optimise their energy mix.

It should be noted that the analysis of activities along renewable energy or nuclear value chains (renewable energy-related) are not included in the analysis of this publication. However, upstream and downstream life-cycle emissions of related renewable energy or nuclear (uranium) sourcing, manufacturing, recycling of components or energy storage and waste management will become increasingly important with a decarbonised power generation sector and banks might need to revisit their power generation targets approach in future. Complementary targets or indicators for manufacturing of renewable energy can also be considered. As discussions around this topic will evolve, this might further be explored by NZBA in future working groups.

12 Non-CO_2 gases play a significant role when considering biomass as an energy source.

4. Design choices for scenarios and benchmarking sectors

4.1 Metric types

Absolute versus intensity emissions

The NZBA Guidelines for Climate Target Setting for Banks suggests setting targets on either an absolute emission and/or sector-specific emissions intensity (e.g. gCO_2/kWh) basis, each of which fulfils a different purpose.

Absolute emissions: Absolute emission refers to the total quantity of greenhouse gases released into the atmosphere from power generation per year (e.g. tCO_2e/y).

Absolute emission (tCO_2e)	=	Production (kWh)	×	Emissions factor (gCO_2e/kWh)

Emission intensity:[13] Emission intensity measures the amount of carbon dioxide emitted per unit of energy produced and is expressed in **tCO_2e/MWh**.

$$\text{Emission intensity} = \frac{\text{Total GHG emissions } (tCO_2e/y)}{\text{Production metric (MWh)}}$$

Using a target expressed in absolute terms preserves a direct link to the 1.5°C carbon budget, meaning it is unlikely to over- or underestimate warming impact. As the decarbonisation of sectors such as shipping, transportation, or real estate is dependent on its emission profile, the power generation sector is expected to grow. As such, measuring counterparty performance only in absolute terms may not encourage important transition activities—for example the transition from fossil fuels to renewable energy

13 It is important to note that emissions intensity can be expressed as either physical or economic intensity. Using physical intensity metrics has many benefits, including a stronger link to counterparty production decisions and less exposure to volatile economic indicators (e.g. revenues, enterprise value). Asset managers may therefore find them helpful for engaging counterparties on the specific drivers of emissions. In sectors or activities in which it is not possible to define a homogenous production unit, economic intensity can be used more broadly, bearing in mind that it introduces substantial volatility and may be difficult to extract from forward-looking scenarios during benchmark construction.

sources separate from operational decarbonisation activities—unless the portfolio alignment method in question includes specific adjustment mechanisms to compensate for these phenomena.[14]

It may incentivise divestment of assets to other institutions that are less interested in tackling climate change, thereby losing the opportunity to engage with the client and assist them with their decarbonisation.

On the other hand, emission intensity targets capture the progress on decarbonisation while decoupling it from economic growth. As such, the emission intensity metric does not disincentivise key transition activities in the same way as absolute units. However, a key disadvantage of intensity metrics, particularly physical intensity metrics, is that they may not preserve a direct link to the carbon budget. As a result, a company may exceed its 1.5°C carbon budget while appearing aligned based on intensity terms. Indeed, such indicators can over- or underestimate warming if the projections of sectoral physical output used as a denominator are not kept up to date. Targets expressed in these terms enable the evaluation of the climate performance of different utilities.

Banks can opt for dual metrics to demonstrate energy performance improvements (emission intensity) as well as provide an indication of the real-world impact of the transition (absolute emissions).

It should be noted that avoided emissions are an emerging focus within the net-zero landscape, with potential for demonstrating the positive impact of a transition to greener energy sources. However, current methodologies and data for calculating and verifying these emissions are not yet robust enough to be integrated into this publication. Various stakeholders in the net-zero space are actively developing more reliable and standardised approaches for quantifying avoided emissions. Until these methodologies mature and gain wide acceptance, they remain an uncertain variable of current target-setting calculations.

Technology-based metrics

Given that power generation solutions and their pathways toward decarbonisation rely on the utilisation of diverse technologies, banks may consider additional metrics to offer clarity on the transition of portfolios and their financing of net-zero strategies. One such metric, known as technology mix metrics, can illustrate the disparity between the reduction in financing for fossil fuel power generation compared to low-carbon alternatives. This metric offers insights into the composition of power financing within the portfolio, representing the portfolio's exposure to various secondary energy technologies as a percentage of the overall exposure (Katowice Banks 2020).

14 For more methodological information, see Institut Louis Bachelier (2020).

4.2 Attribution and aggregation approaches at portfolio level

This section discusses approaches for the attribution of the emissions of a power generation plant to the financial institution providing the financing to sector-wide portfolio emissions. Two approaches are available to banks: the balance sheet approach and the portfolio weight approach.

Balance sheet approach according to the Partnership for Carbon Accounting Financials (PCAF)

Balance sheet approaches in the context of climate net-zero targets usually refer to a holistic assessment of a bank's assets and liabilities in relation to its exposure to carbon-intensive sectors.

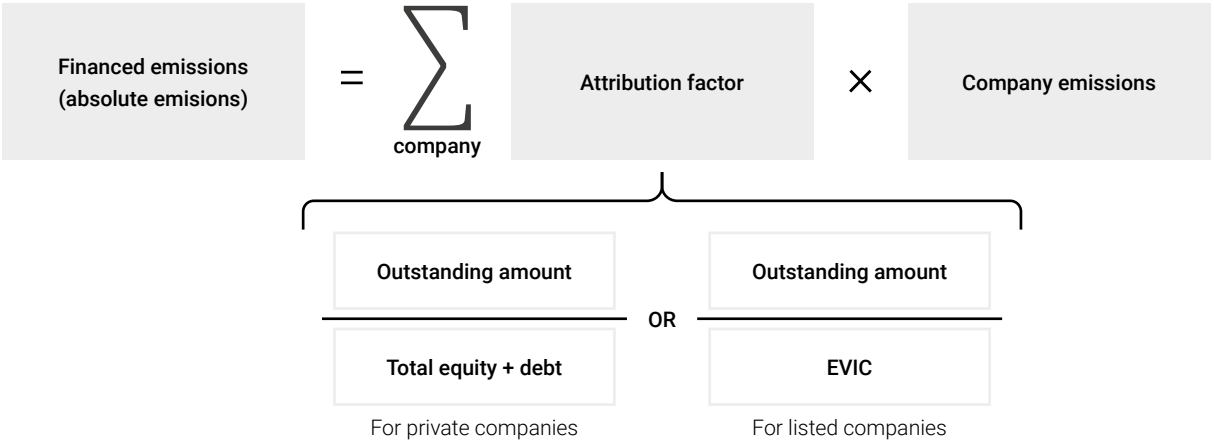
Applying an attribution factor based on the economic value including cash (EVIC) could result in double accounting of emissions if debt outside the company's gross debt is also included. While the primary focus for most banks is currently on power generation activities only, it is important to note that the balance sheet approach may not fully capture the diversification of a company's activities unrelated to power generation, such as transmission. Given the often-insufficient granularity of available data, these unrelated activities are not always easily disaggregated, introducing an additional nuance to the assessment of a bank's carbon exposure. For dedicated purpose loans, other activities like transmission may be excluded from analysis while for general purpose loans company-wide emissions will be reflected in the business mix.

To eliminate fluctuations in the emissions intensity metric and maintain reliability, both emissions and energy output (MWh) are calculated using the same attribution factor. Otherwise, using different attribution factors might introduce variability into the emissions intensity metric. Such variability can make it difficult to discern genuine progress in decarbonisation efforts from mere statistical noise.

The balance sheet approach[15] is illustrated in Equation 1 using absolute emissions.

15 Guarantees, letter of credits and factoring of capital non-cash in rapid credit facility are not included in this equation.

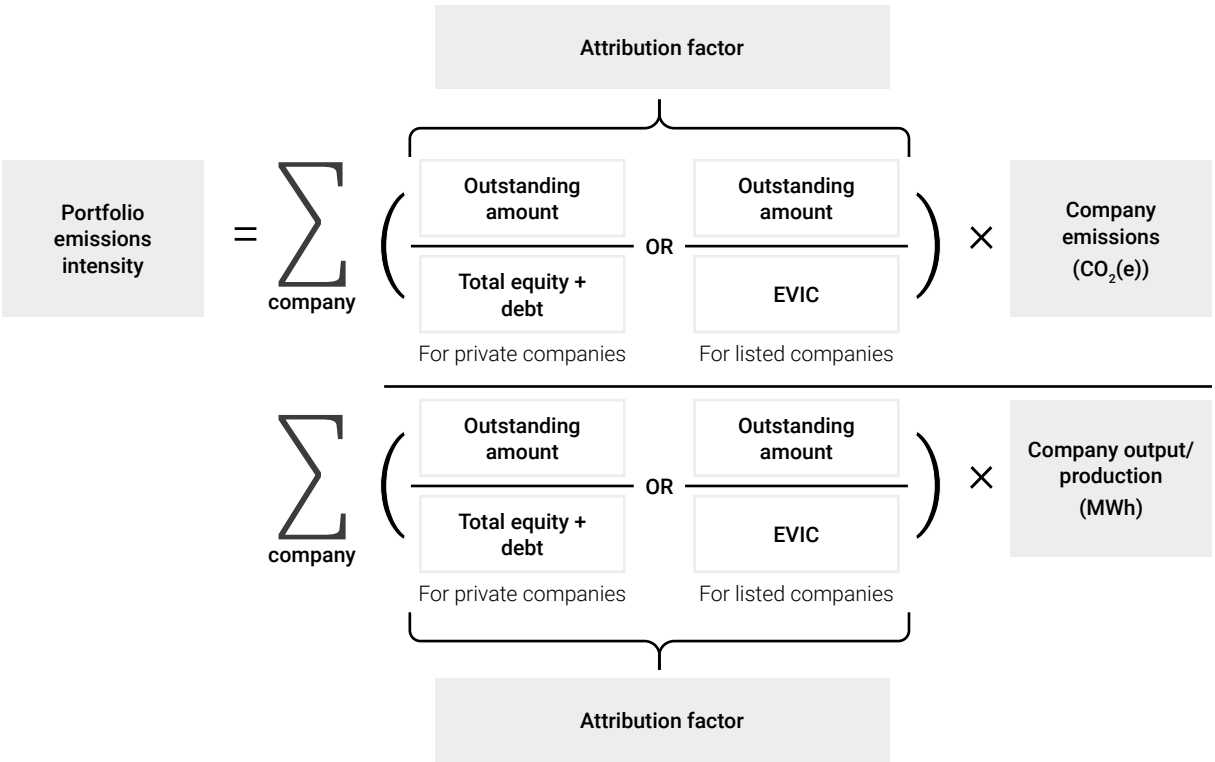
Equation 1: Balance sheet approach (absolute emissions)



Variable for emissions is the total accounted emissions of a company

The balance sheet approach[16] using intensity emissions is illustrated in Equation 2

Equation 2: Balance sheet approach (emission intensity)



Variable for emissions is the total accounted emissions of a company

Variable for output/production is the total energy output of a company

16 Guarantees, letter of credits and factoring of capital non-cash in rapid credit facility are not included in this equation.

Portfolio weight approach (total of eligible products)

The portfolio weight approach (Equation 3) is a methodology where each asset or counterparty's emissions intensity is multiplied by its respective financial weight in the portfolio. The advantage of this approach is that it is simple to implement as it does not require information on the value or companies' debt and equity or EVIC. The calculation is based on the total book value of a bank, encompassing all products that fall within the scope of the power generation portfolio.

Importantly, this method also allows for the consideration that companies may have different emissions intensities in power generation due to their involvement in various other activities along the value chain. However, it may not account for differences in company sizes and production capacity, especially in cases where exposure to two companies is similar if not the same.

Equation 3: Portfolio weight approach

$$\text{Weighted average emissions intensity} = \sum_i \text{Asset level emissions}_i \text{ intensty} \times \text{Portfolio share in \%}$$

Weighted average emissions intensity =∑i(Attribution factor *i* × portfolio share in % *i*)
where:
Asset level emissions ***i*** = is based on emissions intensity on an asset level and aggregated to portfolio level
i denotes each borrower or investee

4.3 Emissions and client data

Emissions-related data requirements

Emissions-related calculations for power generation will depend on the input source, namely coal, oil, gas, solar, wind, nuclear and so on.

The calculation of emissions intensity requires various data input sources to calculate portfolio emissions or estimate proxies, including but not limited to:

- **Production volumes** (GWh) broken down by technology (nuclear, gas,[17] wind, etc.) that can be taken from a third-party data supplier or extracted from clients' annual reports. Where such data is unavailable, it can be calculated from installed capacity (MW).
- **Installed capacity per technology per counterparty**, which is used in the emissions intensity calculation as well as to estimate portfolio generation capacity mix. It is the starting point for understanding the capacity of each technology that a client has for power generation.
- **Capacity factors per technology** measure how often an electric generator operates over a specific period, using a ratio of the actual output to the maximum possible output over that period—the actual electricity production from the installed capacity.

17 Gas can further be broken down as seen in Table 3.

The metric is essential for determining the "real production per technology", which is the actual energy output that can be linked to the emissions.

- **Implied emission factor per technology** represents the relationship between emissions estimates and production data. It allows comparison of emission factors between technologies.

Equation 4: Calculation for real energy production in GWh

Emission factors

An emission factor is a coefficient that represents the average emission rate of a given pollutant for a given source, relative to units of activity or process/material throughput. For example, it could be expressed as kilograms of CO_2 per tonne of coal burned. When emissions or production data are not available, load and emissions factors can be taken from calculations from IEA, the International Renewable Energy Agency (IRENA) or other national databases.

Table 3: Scope 1 emission factor per technology (not exhaustive)

Technology[18]	Range of Scope 1 emission factors (in gCO_2e/kwh)	Additional distinctions
Coal	800–1100	Lignite, hard coal, peat
Fuel oil	600–900	Crude oil, kerosene, diesel gasoline, liquid petroleum gas
Gas (combustion turbine)	400–600	
Gas (gas and co-generation combined cycle)	300–400	
Gas (other)	500–700	Refinery gas
Waste	0	
Nuclear, hydraulic, other renewable energies	0	

Source (selection): EIB (2023)

18 The table does not include biomass due its GHG accounting complexities. The Greenhouse Gas Protocol for instance states that emissions of burning pure biomass should not be included in Scope 1 emissions but should be reported separately.

Data requirements

Table 3 summarises the required data inputs for computing the discussed metrics.

Table 4: Technology related data input

Input data required	Units	Type
Installed capacity	MW	Technology
Capacity factor per technology[19]	%	Technology
Load factor[20]	%	Technology
Efficiency	%	Technology
Bank financing	EUR, USD, JPY etc.	Financial
Counterparty EVIC or total debt and equity	EUR, USD, JPY etc.	Financial

EVIC can be calculated from equity (either market value or loan book value) and total debt data, either provided a by a third party of estimated based on an industry average (EVIC/revenue proxies).

Data challenges

Banks face several challenges in obtaining the right level of data, some of which are outlined in Table 5.

Table 5: Availability of data compared between corporate lending and project finance (not exhaustive)

Availability of data	Corporate lending	Project finance
Breakdown of emissions per power generation per power plant	Difficult	Usually available
Breakdown of gas-fired production (CCGTs and non-CCGTs)	Difficult	
Scope 2 emissions	Usually available (for group company), difficult (for divisions)	Difficult
Optional data requirements		
Documentation of origin of input source (biomass)	Difficult	Usually available
Life-cycle emissions	Difficult	Difficult
Allocation issues of emissions in multi-output utilities	Difficult	Usually available

19 Capacity factor measured the overall actual utilisation of a power generation plant over a given period (per annum) in relation to the potential output at full capacity.

20 Load factor is based on the ratio between the average load (amount of kilowatt-hours delivered) and the maximum (possible) load in a given time period.

In the case of project finance, banks can use forecasted power output to measure a client's alignment.[21] Using the project's expected electricity generation data, typically obtained from the project's financial and technical feasibility studies, involves applying a benchmark or target emission factor that aligns with international, national or sector-specific climate goals (such as the targets set in the Paris Agreement). This comparison is used to determine the project's alignment by assessing the forecasted emissions intensity (GHG emissions per unit of power) against the benchmark or target.

Challenges might also occur with power generation companies with multiple economic activities as their reporting is usually not granular enough to differentiate between power generation and other types of activity.

Sources

Climate conditions and technological performances can differ across regions. As a result, a tailored approach is recommended and different sources are required, including:

- Client annual disclosure or direct client reporting to banks
- External data providers
- External scenario providers
- Public statistical database on emissions and technology-related data
- Proxies and internal assumption to overcome data gaps

Table 6 provides an overview of data available in different geographies and the most relevant technology-related databases. Banks may use national and local sources and standards. This table was compiled based on input from NZBA member banks and expert committee members and should not be considered exhaustive.

Table 6: Data sources (not exhaustive)

Country	Data points	Sources
Global	▪ Energy emissions (factors) ▪ Load factors	▪ IEA World Energy Outlook ▪ Carbon Disclosure Project (CDP) GHG Emissions Dataset (link) ▪ Transition Pathways Initiative (TPI) (link) ▪ Exiobase (link) ▪ European Investment Bank (EIB) (link)
	▪ Pathways	▪ One Earth Climate Model (OECM) (link) ▪ IEA NZE 2050 (link) ▪ NGFS (link)
	▪ Company data	▪ Asset Impact (link) ▪ S&P Global Trucost Intelligence (link) ▪ Client reporting ▪ CDP disclosure

21 In many cases, banks base the commercial operation dates (COD) on the electricity generation data that will be obtained. This means if a project was financed in 2023 with generation only commencing in June 2025, the emissions from the project in 2023 and 2024 are considered zero.

Europe		
European Union (including the United Kingdom)	▪ Energy consumption ▪ Energy emission factor	▪ Eurostat (link) ▪ European Environment Agency (EEA): Emission Factor (link)
Germany	▪ Emission factor	▪ Umweltbundesamt (link)
United Kingdom	▪ Sixth Carbon Budget (the United Kingdom pathway)	▪ Climate Change Committee (CCC) (link)
Americas		
United States	▪ Emission factor	▪ Environmental Protection Agency (EPA) (link)
Canada	▪ Emission factor	▪ NRCan (Natural Resources Canada): Comprehensive energy use database (link)
Asia Pacific		
Australia	▪ Energy emissions ▪ Australia-specific 1.5°C scenario	▪ Australian Clean Energy Regulator: Australian Energy Market Operator (AEMO): AusTIMES model (link)

4.4 Proxies and data quality

As data quality improves, reporting changes in data use and quality and quantifying the impact on baseline financed emissions and targets will improve transparency. New data can be included in an addendum to reporting to highlight changes from prior data.

To ensure data quality the following steps and sources can be considered:

- Assessment of data availability
- Third-party data supplier (e.g. Asset Impact)
- PCAF position on data quality
- Potential changes in consumption and fluctuations in energy data

Companies often lack the necessary granularity in their emissions reporting to associate emissions with distinct economic activities. In such cases, utilising asset-level data linked to a company's power generation activities offers the most accurate assessment, effectively excluding emissions that fall outside the defined value chain boundaries. When such granular information is unavailable, a weighted portfolio approach serves as the most reliable method for banks to address data-related challenges.

Financial institutions can use proxies or modelled emissions. To produce these proxies, PCAF offers a series of options to estimate financed emissions. Banks are free to use other frameworks that comply with NZBA guidelines.

Actual data and supplier-specific emissions factors tend to provide the highest level of accuracy on greenhouse gas emissions for financial institutions. PCAF assigns an average data quality score that reflects the overall data quality mix (PCAF 2022). If they are unavailable, regional electricity grid mix data or country-level emission factors can be used instead of supplier-specific emissions factors but score lower on PCAF's data quality hierarchy (PCAF 2022).

Proxies can be valuable when detailed information during target setting are limited or when dealing with smaller entities for whom detailed emissions reporting is not feasible or available. While proxies are useful for assessing physical substitutes, their application becomes more problematic when financial information is missing, as they can lead to incorrect assumptions and potentially distort the true impact of emissions.

5. Scenario and target-setting approaches

5.1 Scenario choice

NZBA guidelines direct member banks to widely accepted science-based decarbonisation scenarios to guide members when setting individual long-term and intermediate targets that are aligned with the temperature goals of the Paris Agreement. In addition, per the guidelines, "scenarios selected shall be 'no overshoot' or 'low-overshoot' scenarios,"[22] and should have a greater than 50 per-cent probability of limiting global warming to 1.5°C by the end of the century. If banks consider alternative regional scenarios, they should still comply with the NZBA guidelines.

IEA Net Zero Emissions by 2050 Scenario (IEA NZE 2050)

This scenario is a widely adopted benchmark against which to measure the performance of power generation utilities. Thus, broad adoption of the scenario will enhance comparability across loan books. In IEA NZE 2050 sector of the economy decarbonise roughly to zero by 2050, asking all dependent sectors to decarbonise in a relevant manner and putting the onus on all sectors. The IEA scenario requires the least energy-related CO_2 removal and bioenergy of all the IPCC-assessed scenarios that achieve net-zero energy sector and industrial process CO_2 emissions in 2050. The data provided by the IEA includes Scope 1 emissions from electricity generation.

The intensity in 2030 projected by the IEA's NZE scenario is 186 gCO_2e/kWh. This intermediate milestone toward net zero has increased from 138 gCO_2e/kWh in the initial IEA 2021 NZE scenario.[23]

Network for Greening the Financial System (NGFS)

The transition pathways for NGFS scenarios have been generated with well-established integrated-assessment models that combine macroeconomic, agriculture and land-use, energy, water and climate systems into a common numerical framework. NGFS scenarios provide regional emissions in the 1.5°C aligned pathway. In NGFS there is more reliance on the power sector (where net emissions are significantly negative by 2050) and less need for other sectors to decarbonise.

22 Guidelines for Climate Change Target Setting for Banks can be found on UNEP FI's website: unepfi.org/net-zero-banking/commitment/

23 The 2022 NZE scenario already stated an increase of expected emissions intensity for the sector to 165 gCO_2e/kWh. As per NZBA Guidelines (2024, p. 18) banks need to take changes into account and revise their targets on a regular basis, at least every five years to remain in line with the most recent scientific information.

Regional scenario breakdowns from the Transition Pathways Initiative (TPI)

Whether it be due to data availability, methodological limitations or company operations (international versus local presence), for certain sectors, regional benchmarks might be inappropriate or nonviable for certain sectors. As electricity is not a globally traded commodity and utilities tend to operate in individual regions, real economy companies and banks alike can consider setting decarbonisation targets for the power generation sector based on regionally differentiated benchmarks, such as the ones provided by the Transition Pathways Initiative Centre.

The TPI Centre provides four regional benchmarks, namely the European Union, North America, other OECD countries and non-OECD countries, and assigns regional alignment scores (in addition to the global electricity utilities benchmark) to companies with a revenue concentration of at least 90 per cent in one of these four classifications.[24]

Note that it is important to recognise that these scenarios are potential pathways and not forecasts and operate on underlying assumptions and simplified models that might not consistently mirror actual progress. Banks may wish to acknowledge and address these limitations in their target setting and transition plan development.

For additional information on available scenarios, see GFANZ guidance on the use of sectoral pathways for financial institutions (GFANZ 2022).[25]

5.2 Benchmarking approaches

Scenarios distribute the available carbon budget over time and to sectors along different trajectories. These macro trajectories are then distributed to create individual benchmarks for counterparties and financial institutions. Three approaches are possible; when choosing between these designs, it is important to consider the incentives they create for the counterparties being measured. In addition, a portfolio's geographic and asset class distribution is an important consideration when choosing a benchmarking approach and calibrating the benchmark.

These three approaches do not possess sector-specific characteristics and can be universally applied to other sectors. Their primary objective is to enable aggregation across a portfolio. They are listed here only as examples and will not be discussed in further detail. For more information, see the Science Based Target Initiative (SBTi) and the Portfolio Alignment Team (PAT).[26]

The **convergence approach** implies that all counterparties are encouraged to converge to desired industry-average emissions levels. This metric is applicable to emission intensity metrics only.

24 Additional information can be found under transitionpathwayinitiative.org/publications/uploads/2021-carbon-performance-assessment-of-electricity-utilities-note-on-methodology

25 GFANZ_Guidance-on-Use-of-Sectoral-Pathways-for-Financial-Institutions_June2022.pdf (bbhub.io)

26 The Portfolio Alignment Team was formed to respond to growing investor and lender interest in measuring portfolios' relative alignment to the objectives of the Paris Agreement, and to advance industry efforts to promote widespread adoption of a consistent, robust and decision useful approach. tcfdhub.org/wp-content/uploads/2021/10/PAT_Measuring_Portfolio_Alignment_Technical_Considerations.pdf#page=78

It disadvantages counterparties that are more carbon intensive than their industry average, while reducing incentives for counterparties with below-average emissions intensity to continue decarbonisation. A general limitation of this approach is that it may not always be possible to extract an emissions intensity convergence pathway from available scenarios for sectors without commonly modelled homogenous units of production.

The **contraction approach** implies that all counterparties are encouraged to reduce emissions at the same desired industry-average rate. The contraction approach does not reflect discrepancies between regions that have a lower initial level of emissions, but a higher emission growth rate compared to regions with an initially higher level of emissions and a lower emission growth rate. Banks who aim to target reductions across regions, require a steady level of emission reduction.

In addition, best-in-class or companies with an already low emissions baseline might be at a disadvantage compared to companies with a high emissions baseline. It is applicable to metrics expressed in both intensity and absolute units. To implement a target using this method, utilities must collect information on the amount of electricity generated and purchased, along with the corresponding emissions in the base year, and then project electricity generation and purchases in the target year (WBCSD 2020).

The **fair share approach** defines the average rate of reduction in emissions (based on absolute emission) for an industry but recognises that individual counterparties will be better- or worse-performing than average. Based on comparing the counterparty's emissions intensity to its industry average, this approach creates a counterparty-specific rate-of-reduction benchmark for absolute emissions.

The selection of one of these approaches has important implications for the data to be considered (i.e. emissions intensity, absolute emissions or production capacity) and compatibility with forward-looking scenarios. For example, while sometimes using emissions intensity-based convergence pathways may be the preferred choice, it may not be feasible to extract an emissions intensity convergence pathway from available scenarios for sectors without standardised units of production (PAT 2021).

According to GFANZ's workstream 1.4, the fair share approach also involves various underlying assumptions that drive uncertainty when operationalised. This is a particular challenge when attempting to account for a corporate's growth within the benchmark. Financial institutions have noted that this trade-off between the robustness of portfolio alignment methodologies and the ease of computation and comprehension is a key barrier to adoption.

6. Trends in target setting across NZBA members

The Net-Zero Banking Alliance 2024 Progress Report found that more NZBA member banks set targets for power generation than any other sector.

Eighty-nine banks had set targets for the power generation sector as of end-May 2024. This represented 73% of the 122 banks included in the report's analysis and a 21% increase in banks setting targets in this sector since the end of September 2023.

There some similarities and some variation in bank's individual choices when target setting for power generation across different geographical regions.

Eighty-six per cent of targets were set as a physical intensity target for this sector, with the remainder split evenly between absolute emissions targets and economic intensity targets.

Seventy-six per cent chose to include all greenhouse gas emissions in their targets and 73% selected the IEA's NZE 2050 scenario to inform their target setting.

There was more variability when it came to which asset classes and scopes banks chose to include.

Figure 3: Intensity metrics vs financial metrics

While a total of 90% of banks based their targets on either Scope 1 or Scope 1 and 2 emissions, around ten per cent of member banks decided to further include Scope 3 emissions (Figure 4). Banks who set targets focusing only on Scope 3, have done so by setting additional targets for the power generation supply chain.

Client emissions scopes covered by the targets

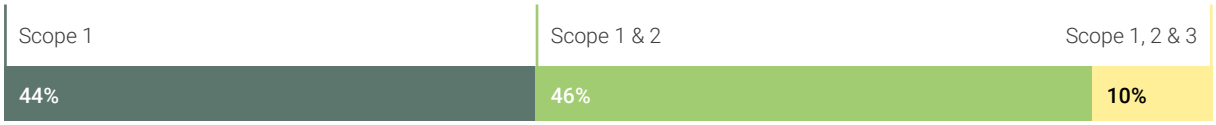


Figure 4: Scope 1, 2 and 3 emissions across targets

The analysis given is intended to provide an overview of the different decisions and should not be interpreted as prescriptive, representative or recommending any specific type of target setting. It serves as a valuable reference for understanding the range of choices and strategies employed by banks in their pursuit of net-zero targets. Each target is informed by its distinct set of criteria and strategic decisions, thereby necessitating a nuanced understanding of their respective contexts and methodologies when evaluating their implications and progress.

7. Conclusion

This paper aims to assist NZBA members and the wider banking sector in setting financed emissions target for the power generation sector.

The power generation sector is a key sector in the net-zero transformation. Multiple sectors including real estate and transportation require an increase of electrification to be able to decarbonise. While overall power demand will increase in the next decades, it is paramount that the sector reduces its energy intensity per kilowatt hour. Banks can use corporate finance or project finance as levers to support the decarbonisation of the sector, including by financing more investments in renewable energy and in phasing out of fossil fuels. Investments in transmission and storage, not usually covered by banks' sectoral targets, will be key to future-proofing grid systems.

While facing several data challenges, banks follow some similar approaches towards setting targets for the power generation sector. Targets are predominantly focused on power generation activities, typically exclude finance for transmission and storage, mainly include all greenhouse gas emissions, and most often use the IEA NZE 2050 scenario. Banks targets tend to vary more when it comes to what asset classes and scopes they include. Scope 3 emissions are usually covered by banks through additional sector targets.

Further accounting methodologies linked to combined-heat-and-power are required for banks that operate in regions where heat (e.g. district heating) is a primary pillar of the respective strategy to move out of coal-fired heating.

Banks face challenges when setting targets in this sector, but, over time, improved data availability, regulatory standards like the International Sustainability Standards Board (ISSB) and national legislation, will enable banks to improve the accuracy and comparability of target-setting approaches.

7.1 Call-to-action for key stakeholders

All actors involved in the power generation industry have the responsibility to take action to support the transition to net zero. Banks' role is to support their clients in the power generation sectors to take the necessary steps to decarbonise and transition in line with net zero. Governments' vital role is to ensure that policy frameworks enable the sector's trajectory towards net zero by 2050, particularly as, depending on jurisdictions, power generation companies can range from free market participants to state-owned entities.

Specific areas that we encourage companies and climate modelers to focus on are:

i. **Enhance disclosure practices:** Companies commit to granular asset-level reporting, including metrics such as MWh produced per asset and CO_2 emissions per asset. This is crucial, not only in regions actively pursuing energy transition but also in less-focused countries.
ii. **Address regional scenario challenges:** For entities with multinational operations, standardising corporate finance assessments becomes complex due to varied regional scenarios. Climate modelers address these complexities to enable a more uniform approach.

Annex A: Analysis of a client's Scope 3 emissions

The World Business Council for Sustainable Development (WBCSD) provided the following overview of a client's Scope 3 emissions, their materiality to clients as well as their ability to control and influence their Scope 3 emissions.

Table 7: Assessment of materiality and ability to control and influence Scope 3 emissions from the perspective of utilities with generation and retail activities (upstream Scope 3 emissions) (WBCSD 2020)

Scope 3 category (upstream)	Sources of emissions	Materiality	Control	Influence
1. Purchased goods and services	Purchase of non-energy related goods and services (e.g. maintenance, office supplies, communication, purchase of chemical products and use of municipality water); upstream emissions from extraction and processing of purchased natural gas that is resold to customers	Medium	High	High
2. Capital goods	Emissions related to the construction or purchase of new fixed assets (e.g. power plants, buildings, technical equipment)	Medium	Low	Medium
3. Fuel- and energy-related activities	Upstream emissions of fossil fuels consumed in electricity generation (e.g. extraction of coal, natural gas, fuel oil and diesel); upstream emissions from third-party generation of electricity purchased for retail; transmissions and distribution losses related to electricity purchased and sold for retail activities	Very high	Low	Medium
4. Upstream transportation and distribution	Transportation of fuels (e.g. coal, natural gas, biomass, fuel oil and diesel) used for electricity generation	Medium	Low	Medium
5. Waste generated in operation	Disposal and treatment of waste generated in the company's operations (in facilities not owned or controlled by the reporting company)	Low	High	Medium

Scope 3 category (upstream)	Sources of emissions	Materiality	Control	Influence
6. Business travel	Transportation of employees for business-related activities (in vehicles not owned or operated by the reporting company)	Low	High	High
7. Employee commuting	Transportation of employees between their homes and their worksites	Low	Low	Medium
8. Upstream leased assets	Operation of assets leased by the reporting company (lessee) and not included in Scope 1 and Scope 2	Low	Low	Low

Table 8: Assessment of materiality and ability to control and influence Scope 3 emissions from the perspective of utilities with generation and retail activities (downstream Scope 3 emissions) (WBCSD 2020)

Scope 3 category (downstream)	Sources of emissions	Materiality	Control	Influence
9. Downstream transportation and distribution	Transportation of by-products (such as coal fly ash) or transport of appliances (e.g. efficient lighting, electric boiler) sold to customers	Low	Medium	Medium
10. Processing of sold products	Usually not relevant to utilities as products are used (category 11) sold to customers	Low	Low	Low
11. Use of sold products	Combustion emissions of natural gas sold to customers	Very high	Low	Low
12. End-of-life treatment of sold products	Usually not relevant as there is no end-of-life treatment of sold products	Low	Low	Low
13. Downstream leased assets	Operation of assets owned by the reporting company and leased to other entities in the reporting year, not included in Scope 1 and Scope 2	Low	Low	Low
14. Franchises	Operation of franchises not included in Scope 1 and Scope 2	Low	Medium	High
15. Investments	Only applies when choosing the operational control approach; in cases where a company has a minority stake and non-operational control of a company, account for emissions under this category, not under Scope 1	High	High	High

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UN environment programme

finance initiative

UNEP Finance Initiative (UNEP FI) brings together a large network of banks, insurers and investors that catalyses action across the financial system to deliver more sustainable global economies.

For more than 30 years the Initiative has been connecting the UN with financial institutions from around the world to shape the sustainable finance agenda establishing the world's foremost sustainability frameworks that help the finance industry address global environmental, social and governance challenges.

Convened by a Geneva, Switzerland-based secretariat, more than 500 banks and insurers with assets exceeding USD 100 trillion are individually implementing UNEP FI's Principles for Responsible Banking and Principles for Sustainable Insurance. Financial institutions work with UNEP FI on a voluntary basis to apply the sustainability frameworks within their industries using practical guidance and tools to position their businesses for the transition to a sustainable and inclusive economy.

Founded in 1992, UNEP FI was the first organisation to engage the finance sector on sustainability. Today, the Initiative cultivates leadership and advances sustainable market practice while supporting the implementation of global programmes at a regional level across Africa & the Middle East, Asia Pacific, Europe, Latin America & the Caribbean and North America.

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