

Handbook on Financed Emissions

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 The
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Council
FOSTERING ECONOMIC GROWTH
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Preface

From Measurement to Market Transformation

The Financed Emissions handbook arrives as Pakistan’s financial sector faces a dual challenge. The country ranks among the most climate-vulnerable globally, with agriculture and textiles facing escalating physical risks. At the same time, international markets are tightening expectations around disclosure, supply-chain resilience, and transition planning. For Pakistan’s banks, preparedness is no longer optional—it is a competitive necessity.

Why Measuring Financed Emissions Matters

Financed emissions—the greenhouse gas emissions associated with a bank’s loans and investments—are typically far larger than a bank’s operational emissions. For Pakistan’s financial sector, they represent the critical link between lending decisions and real-economy climate impact.

Measuring financed emissions serves three strategic purposes. First, it allows banks to identify concentrations of physical and transition risk in their portfolios, enabling proactive credit-policy adjustments and client engagement. Second, it reveals where investment is most needed: water-efficiency upgrades for agriculture, energy-efficiency investments for SMEs, resilience improvements for exporters, and renewable-energy infrastructure. Banks that measure financed emissions can design products that address these needs and capture first-mover advantage. Third, transparent disclosure builds confidence with international investors, development partners, and large corporate clients, translating into improved access to capital and stronger market position.

Direction Over Perfection

One of the greatest barriers to progress is the pursuit of perfect data. This handbook embraces a different philosophy: start with directionally correct estimates, identify hotspots, prioritise engagement, and improve systematically. The methodology—anchored in the Partnership for Carbon Accounting Financials (PCAF) and the GHG Protocol—provides a clear data-quality framework, showing banks how to begin with proxy-based estimates and progress towards verified, client-specific data.

Recognising Pakistan’s unique challenges—limited corporate disclosure, data-poor SME portfolios, and high exposure to climate-vulnerable sectors—the handbook outlines practical workarounds and guidance on how banks can adapt global methodologies using available regional and sector proxies until local emission-factor data become more robust.

Pakistan's Enabling Environment

This handbook operates within Pakistan's evolving regulatory architecture. The State Bank's Green Banking Guidelines and ESRM Framework require integration of environmental and social risks into credit decisions. The Securities and Exchange Commission has adopted IFRS S1 and S2, mandating climate-related disclosure. The Pakistan Green Taxonomy provides classification guidance to distinguish genuinely sustainable finance. And Pakistan's updated Nationally Determined Contributions commit to a 50 per cent reduction in projected emissions by 2030. Together, these frameworks create the conditions for Pakistan's financial sector to lead the climate transition.

This handbook operationalises that vision by providing practical tools to measure, manage, and reduce financed emissions. It builds on the foundation established through the Paris-Aligned Finance Fellowship, which has brought together financial professionals to translate climate-risk concepts into operational practice—moving from scenario analysis to credit-policy adjustments, from taxonomy classification to product origination, and from disclosure frameworks to portfolio steering.

From Measurement to Transformation

Measuring financed emissions is the foundation, not the destination. The real impact comes when banks use that data to redesign credit policies reflecting climate risks, develop new financial products tailored to Pakistan's transition needs, engage clients as partners in transition planning, and set science-based targets for portfolio decarbonisation.

Pakistan's financial institutions face a choice: trail climate disruption or shape the transition. The institutions that integrate climate risk into core decision-making, finance adaptation and transition at scale, and demonstrate progress will shape Pakistan's financial system for the decade ahead.

For Pakistan's financial sector, preparedness is competitiveness.

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Centre of Excellence in Responsible Business (CERB) at the PBC

The Pakistan Business Council (PBC) is a research-based business advocacy platform established in 2005. It is now supported by over 100 local and multinational private sector businesses with significant investment in and long-term commitment to sustainable growth of the country. PBC's major objectives are to advocate policies that lead to creation of jobs, value-added exports and reduction in import reliance through improved competitiveness of manufacturing, services and the agriculture sectors. It also promotes formalisation of the economy. Further information on the PBC is available on www.pbc.org.pk.

Through its Centre of Excellence in Responsible Business (CERB), the PBC works to build capacity and capability of businesses beyond its membership, to adopt high environmental, social and governance standards. CERB's research captures good business practices to help stimulate the economy by providing opportunities for inclusive livelihood and guidance on sustainably using the country's limited resources. For more information on CERB, visit cerb.pbc.org.pk

Crowe Pakistan – Sustainability and Climate Consulting

Crowe Pakistan, established in 1947, is one of the country's oldest professional services firms and an independent member of Crowe Global, a top 10 international accounting and advisory network operating in 145 countries. With over 400 professionals across Lahore, Karachi, Islamabad, and Multan, Crowe Pakistan provides assurance, advisory, tax, technology and sustainability consulting services. Its Sustainability and Climate Consulting Division supports financial institutions, corporations, and public-sector organizations in ESG strategy, climate-risk management, sustainability reporting and assurance, and sustainable finance structuring. Guided by the philosophy "Smart Decisions, Lasting Value," Crowe Pakistan aligns clients with global frameworks such as IFRS S1 & S2, GRI, SBTi, GHGP, and Pakistan's Green Taxonomy. As a knowledge partner, Crowe Pakistan has extensive experience with financial institutions and plays a key role in advancing sustainable finance in Pakistan. <https://www.crowe.com/pk>

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► Introduction

If the world continues under current national and international policy commitments, average global temperatures are projected to rise by roughly 2.1°C to 3.9°C above pre-industrial levels by the end of the century. There is an urgent need to act in the short term for our long-term benefit. To limit global warming to 1.5°C above pre-industrial levels, all sectors of society need to decarbonise and collectively reach net-zero emissions by 2050. The financial sector has a pivotal role to play by mobilising and directing capital towards activities and innovations that enable this transition.

For this to happen, financial institutions including commercial banks, investment banks, and asset managers first need to acknowledge both the scale and pace of decarbonisation that is required. A key step is understanding the climate risks embedded in their portfolios and quantifying the greenhouse gas (GHG) emissions linked to their loans and investments.

Measuring financed emissions provides the foundation for risk assessment, target-setting, portfolio alignment, and transparent reporting. It also supports internal discussions and engagement with stakeholders about concrete actions to lower emissions.

Moreover, emissions data serve as a valuable tool for identifying both risks and opportunities in the transition. For example, portfolio stress testing against potential climate policies, such as carbon pricing, can reveal the resilience or vulnerability of certain investments. These insights enable more robust risk-management strategies and can uncover business opportunities that contribute to both financial stability and the broader transition to a low-carbon economy.

What Are Financed Emissions?

Financed emissions refer to the greenhouse gas (GHG) emissions associated with financial services, investments, and lending activities of financial institutions. These emissions occur indirectly and stem from the businesses and projects that banks finance. Given the scale of capital flows, financed emissions often exceed an institution's direct operational emissions, making them a critical factor in climate impact assessments and sustainability reporting.

By positioning financed emissions within the broader Scope 1–3 framework, banks can see clearly why their greatest climate impact lies in portfolio choices, not internal operations.

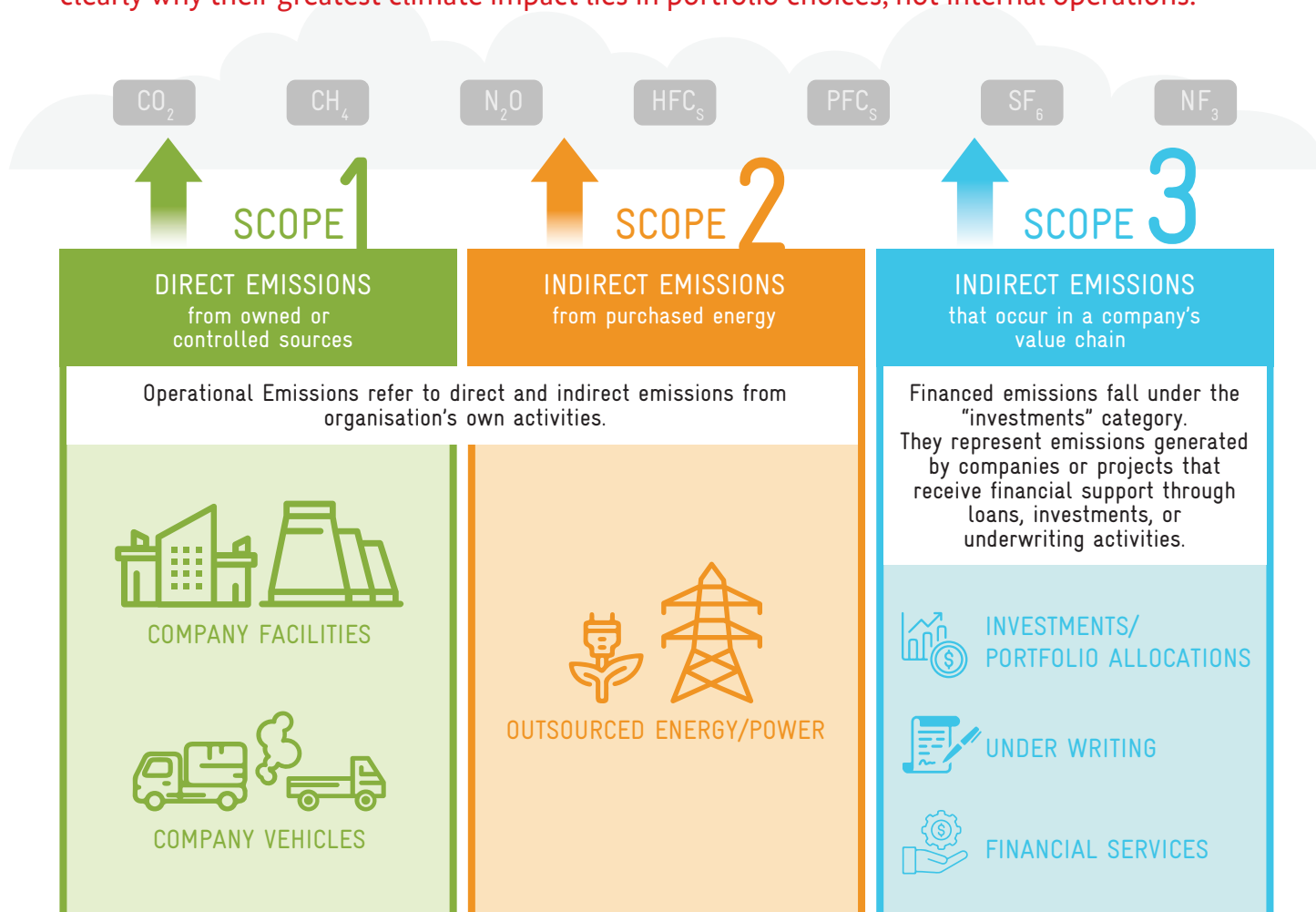


Figure 1 – Adapted from <https://www.musimmas.com/resources/blogs/demystifying-scopes-1-2-and-3-emissions-in-the-palm-oil-industry/>

Why Measure Financed Emissions?

Measuring financed emissions allows the banking sector to make transparent climate disclosures on their GHG emissions exposure, identify climate-related transition risks and opportunities, and set the baseline emissions for target-setting.

MEASURING FINANCED EMISSIONS ENABLES FINANCIAL INSTITUTIONS TO ALIGN DISCLOSURES WITH ESTABLISHED FINANCIAL REPORTING TIMELINES.

ACCOUNTABILITY

Banks are not just passive capital providers – they actively shape economic activity through lending and investment decisions.

TRANSPARENCY

Transparent reporting of financed emissions.

MANAGE RISKS

Climate-related risks – both physical and transition – can significantly affect asset values and financial stability.

DEVELOP TRANSITION PLANS

It enables banks to set science-based targets for emissions reduction.

CAPITALISE ON OPPORTUNITIES

CLIMATE SOLUTIONS

Prioritise capital allocation to businesses with credible net zero transition plans.

FINANCING OR ENABLING ENTITIES THAT ARE ALREADY TO A 1.5 PATHWAY

Scale investments in renewable energy, carbon capture, and nature-based solutions.

FINANCING OR ENABLING ENTITIES COMMITTED TO TRANSITIONING IN LINE WITH 1.5 ALIGNED PATHWAYS

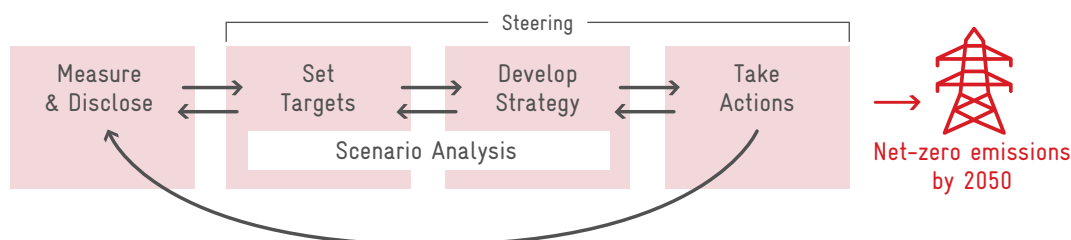
Mobilise finance for emerging markets and developing economies through blended finance and risk mitigation tools.

MANAGED PHASEOUT VIA EARLY RETIREMENT OF HIGH EMITTING PHYSICAL ASSETS

Provide financial support for decarbonisation and innovation in carbon-intensive industries.

DEVELOPING TRANSITION PLANS

Financed emissions measurement is not an end goal but a means to enable systemic change in financial decision-making. Without translating numbers into action, banks risk reducing financed emissions reporting to a compliance exercise. Transition plans ensure that financed emissions data are actively used to steer portfolios toward low-carbon pathways, enabling the banking sector to align with Pakistan's Nationally Determined Contributions (NDCs) and a long-term climate strategy.



Source: GFANS Recommendations and Guidance on Financial Institution Net Zero Transition Plans and PCAF

Figure II

▶ How to Use the Guide

This handbook has been designed as a practical guide for banks in Pakistan to measure, report, and strategically use financed emissions data. It integrates global best practices such as the Partnership for Carbon Accounting Financials (PCAF) and the Greenhouse Gas Protocol (GHGP), with local frameworks including SECP's reporting requirements, SBP's prudential guidance, and the Pakistan Green Taxonomy.

The structure follows a step-by-step progression, taking banks from understanding the concept of financed emissions all the way to setting measurable net-zero targets.

1. Standards Framework for Financed Emissions

PAGE 10

This section explores global standards for financed emissions and how they support the data needs for Pakistan's green and climate finance infrastructure.

2. Defining Scope and Objectives

PAGE 16

This section highlights why defining scope and boundaries is essential for consistent attribution, data use, and reporting, ensuring credible climate accountability.

3. Methodology, Data Collection and Calculation of Financed Emissions

PAGE 26

This section outlines the methodology for financed emissions accounting: identifying asset classes, calculating attribution factors, assessing data quality, performing emissions calculations, and deriving Economic Emissions Intensity with a case study.

4. Environmental and Social Due Diligence

PAGE 50

This section summarises the key steps in applying the SBP's Environmental and Social Risk Management Framework.

5. Pakistan Green Taxonomy (PGT)

PAGE 53

This section covers sectors and economic activities under Pakistan Green Taxonomy (PGT), screening criteria, and links PGT classification of the textile industry with PCAF financed emissions results.

6. Reporting and Disclosure

PAGE 61

This section covers IFRS S2 disclosure requirements, quantitative and qualitative measures, reporting templates, and using financed emissions data for shadow carbon pricing, stress testing, and scenario analysis.

7. Target Setting and Decarbonisation Pathways

PAGE 70

This section focuses on developing net-zero transition plans for banks, setting SBTi targets, designing portfolio decarbonisation strategies, aligning with TPT and Pakistan's NDC, and ensuring continuous monitoring and reporting with practical examples.



1

Standards Framework for Financed Emissions

IN THIS SECTION:

- 1.1 The Greenhouse Gas Protocol (GHGP)
- 1.2 The Partnership for Carbon Accounting Financials (PCAF)
- 1.3 How GHGP and PCAF Work Together
- 1.4 Integration with Pakistan's Local Frameworks

Measuring financed emissions is not a stand-alone exercise. It rests on globally recognised frameworks that ensure banks measure, report, and disclose their climate impact in a way that is credible, comparable, and decision-useful. For banks in Pakistan, applying these standards is essential not only to meet international benchmarks but also to comply with domestic requirements under the State Bank of Pakistan (SBP), the Securities and Exchange Commission of Pakistan (SECP), and the Pakistan Green Taxonomy.

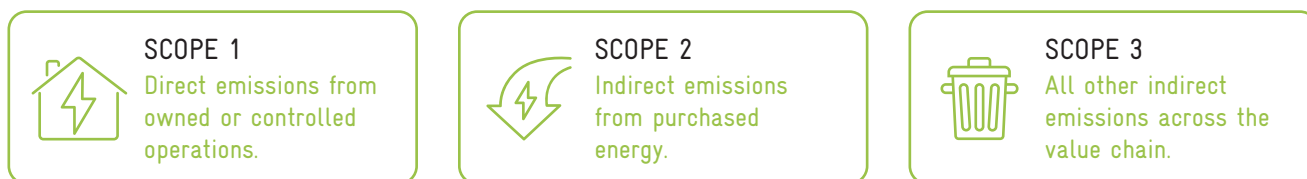
At the heart of this system are two complementary global standards: the Greenhouse Gas Protocol (GHGP), which provides the broad accounting framework for emissions measurement, and the Partnership for Carbon Accounting Financials (PCAF), which translates those principles into financial-sector methodologies. Together, they create a layered approach that allows banks to capture financed emissions in a way that aligns with both international best practice and Pakistan's regulatory ecosystem.

1.1 The Greenhouse Gas Protocol (GHGP)

The GHG Protocol, developed jointly by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), is the most widely used standard for greenhouse gas accounting worldwide. It forms the backbone of how companies, governments, and financial institutions measure and report emissions.

For banks, the most material category is Scope 3, Category 15: Investments. This category explicitly requires financial institutions to account for the emissions associated with their loans, equity investments, and debt holdings. In essence, it recognises that when a bank provides capital to a company, it is indirectly responsible for a share of that company's emissions.

The Protocol divides emissions into three categories:



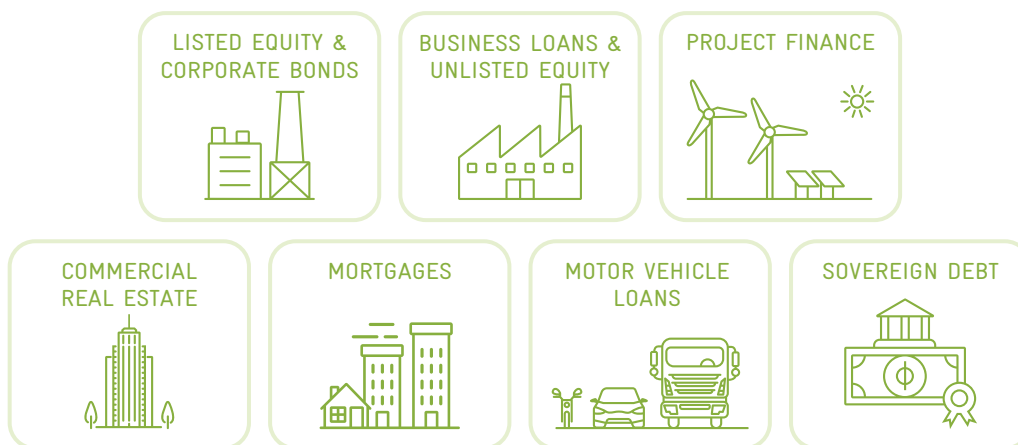
The GHGP thus establishes the principle that financed emissions are part of a bank's Scope 3 footprint. It provides guidance on proportional accounting—requiring banks to calculate their share of an investee's emissions based on the extent of their financing—and to disclose these emissions transparently. Importantly, the Protocol also sets expectations for banks to report not only financed emissions but also their own Scope 1, Scope 2, and other relevant Scope 3 categories, ensuring a full and balanced emissions inventory.

For Pakistan, adopting GHGP ensures that financed emissions reporting by banks aligns with global corporate disclosure standards, making it easier to compare with peers, attract international investment, and prepare for compliance with IFRS S2 climate disclosure requirements.

1.2 The Partnership for Carbon Accounting Financials (PCAF)

While the GHGP defines what banks must report, the Partnership for Carbon Accounting Financials (PCAF) provides the detailed guidance on how to measure financed emissions. Established in 2015, PCAF has become the global benchmark for financial-sector emissions accounting, with over 500 banks, asset managers, and development finance institutions as signatories.

PCAF translates the GHGP's principles into practical methodologies that cover the full spectrum of financial products. It provides harmonised approaches across seven asset classes that are most relevant for banks:



For each of these asset classes, PCAF outlines:

Attribution principles:

How to calculate the share of emissions a bank is responsible for, based on the amount of financing relative to the investee's enterprise value or asset size.

Data hierarchy:

A clear system to prioritise high-quality borrower-specific data, while allowing fallback to industry averages or proxy data where necessary.

Data quality scoring:

A scale from 1 (best quality, verified client data) to 5 (proxy estimates), which must be disclosed to promote transparency and continuous improvement.

Figure 1.2

The strength of PCAF lies in its consistency and comparability. By using standardised methods, banks can ensure that their financed emissions are measured in the same way as peers, regulators, and investors expect. This is critical for Pakistan's banks, which increasingly need to benchmark against international institutions while competing for global capital flows.

1.3 How GHGP and PCAF Work Together

The GHGP provides the umbrella accounting framework: it defines the boundaries of emissions, establishes financed emissions as part of Scope 3, and ensures consistency with corporate reporting standards across sectors.

PCAF builds directly on this foundation, offering the toolkit for the financial sector to apply those principles at the level of loans, bonds, mortgages, and project finance. In practice:

- The GHGP recognises the banking sector's role in financing emissions and stipulates that these financed emissions must be reported.
- The PCAF provides a standardised methodology for calculating these emissions.

This alignment ensures that banks' disclosures are both methodologically sound and comparable across markets. It also provides a pathway for continuous improvement: banks can start with proxies (PCAF score 5) and gradually move towards verified client-level emissions (score 1), strengthening their disclosures year on year.

1.4 Integration with Pakistan's Local Frameworks

Global standards must be embedded within Pakistan's regulatory and prudential ecosystem to be effective. Three frameworks are particularly important.

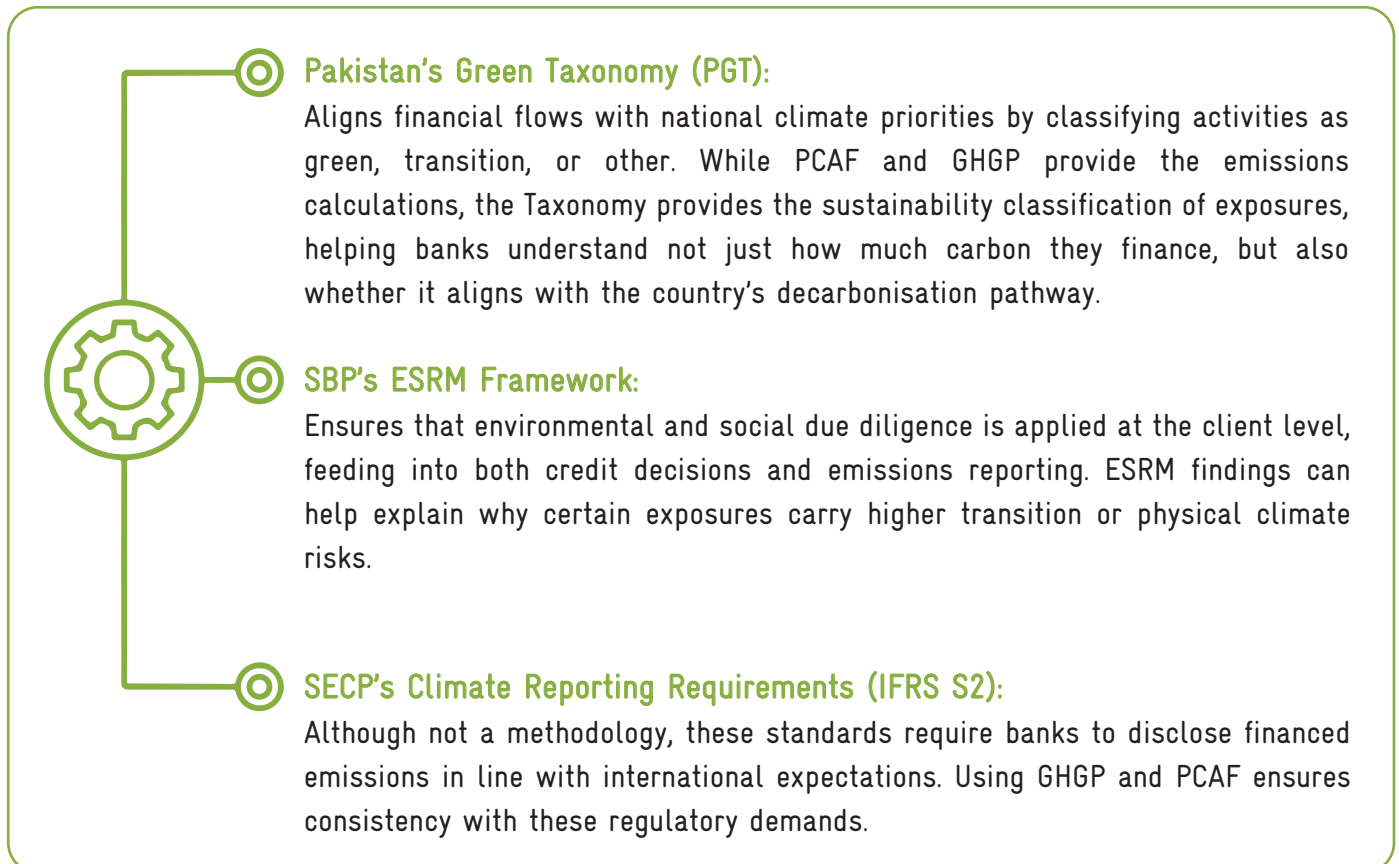


Figure 1.3

2

Defining Scope & Objectives

IN THIS SECTION:

- 2.1 Purpose of Measurement – Why is the Bank Measuring Financed Emissions?
- 2.2 Scope: Defining Boundaries – What Activities, Asset Classes, and Boundaries Are Included?
- 2.3 How Can Attribution, Data Use, and Reporting Conventions Be Applied Consistently?
 - 2.3.1 The Role of Asset Classes in Financed Emissions Accounting
 - 2.3.2 How Can Attribution, Data Use, and Reporting Conventions Be Applied Consistently?
 - 2.3.3 Data Identification and Availability
 - 2.3.4 Identify Relevant Asset Classes

Establishing scope and objectives is the foundation of financed emissions accounting. Without clear boundaries and purpose, results can be misleading, inconsistent, or incomparable across time and peers. In practice, this chapter answers three critical questions:

- ?**

 1. **Why is the bank measuring financed emissions?**
 2. **What activities, asset classes, and boundaries are included?**
 3. **How will attribution, data use, and reporting conventions be applied consistently?**

Anchoring these decisions in the GHG Protocol (Scope 3, Category 15: Investments) and operationalising them through PCAF's asset-class methodologies ensures that banks in Pakistan build financed emissions inventories that are technically robust, transparent, and globally comparable while aligned with local regulatory frameworks.

| 1. Purpose of Measurement | 2. Defining the Boundary | 3. Defining the Asset Classes | 4. Attribution Method | 5. Data Availability | 6. Benchmarking |
|--|--|--|---|---|---|
| Clarifies why financed emissions are being measured. A clear purpose ensures alignment with both global frameworks and Pakistan's NDC commitments. | The boundary establishes which entities, activities and financial instruments are included in the emissions assessment, ensuring consistency in scope. | Asset classes specify the types of investments included in the assessment. | Emissions are allocated differently depending on the share of exposure in the client or project. | Different asset classes have varying levels of data accessibility and quality. | Ensures that results are placed in context by comparing them over time, across sectors, and against peers. |
| EXAMPLES | | | | | |
| A bank discloses financed emissions to meet SECP's IFRS S2 requirements while also using the data to design green sukuk products. | Applying the financial control approach, a bank reports 100% of emissions from a subsidiary it controls; other loans remain in Scope 3 Category 15. | Measuring project finance loans (known use of proceeds) separately from general-purpose corporate loans (known use of proceeds). | A bank financing 20% of a renewable energy project attributes 20% of the project's emissions (or avoided emissions) to its portfolio. | Listed equity → public GHG disclosures (high data quality). Business loans → private company data, often incomplete (proxy reliance). | Comparing financed emissions intensity of the bank's power sector portfolio against both global peers and Pakistan's decarbonisation pathway. |

Figure 2.1

2.1 Purpose of Measurement - Why is the Bank Measuring Financed Emissions?

The starting point is to define the business purpose for undertaking financed emissions accounting. Purpose determines ambition, level of detail, and resource allocation. For most banks, multiple objectives converge.

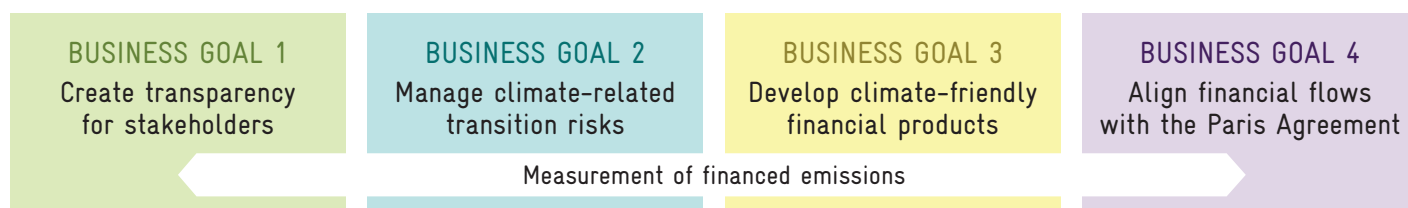


Figure 2.2

BUSINESS GOAL 1

Transparency for stakeholders: Clients, regulators, and investors demand disclosure of how financial flows align with climate goals. Financed emissions provide a transparent metric that links banking activities to real-economy climate impact.

BUSINESS GOAL 2

Manage climate-related transition risks: Financial institutions are increasingly inclined to understand the exposure of their portfolios to risks posed by climate-related policies and regulations. GHG accounting helps these institutions screen and identify areas of their lending and investment activities that fall under emission intensive assets. Such lending and investment activities could suffer setbacks resulting from the introduction of carbon prices and policies and regulations that are strict on fossil fuels.

BUSINESS GOAL 3

Develop climate-friendly financial products: With the transition to a low carbon economy, financial institutions can develop innovative products and services- green sukuk, sustainability-linked loans, transition financing- that enables their clients to decarbonise their business activities. By measuring financed emissions financial institutions can see which sectors and businesses require the most help in their decarbonisation efforts and how best to support them in their transition to a net-zero future.

BUSINESS GOAL 4

Align financial flows with the Paris Agreement: By quantifying financed emissions, banks can track whether their portfolios are on a decarbonisation pathway consistent with a 1.5°C future and Pakistan's commitment to reduce projected emissions by 50% by 2030 (15% unconditional, 35% conditional).

2.2 Scope: Defining Boundaries – What Activities, Asset Classes, & Boundaries are Included?

The scope determines what is included in the financed emissions inventory. The GHG Protocol provides the overarching framework, while PCAF ensures consistency at the asset-class level.

Organizational Boundary

Banks must align their financed-emissions boundary with the consolidation used in their financial statements. Two main approaches are permitted under the GHG Protocol.

a. Equity Share Approach

The bank accounts for emissions in proportion to its equity stake in subsidiaries or investments. This approach reflects the bank's economic interest in the entity.

Example: If a bank owns 25% of a subsidiary, it reports 25% of that subsidiary emissions.

b. Control Approach

The bank accounts for 100% of the emissions from entities over which it has financial or operational control. This approach reflects decision-making power rather than shareholding.

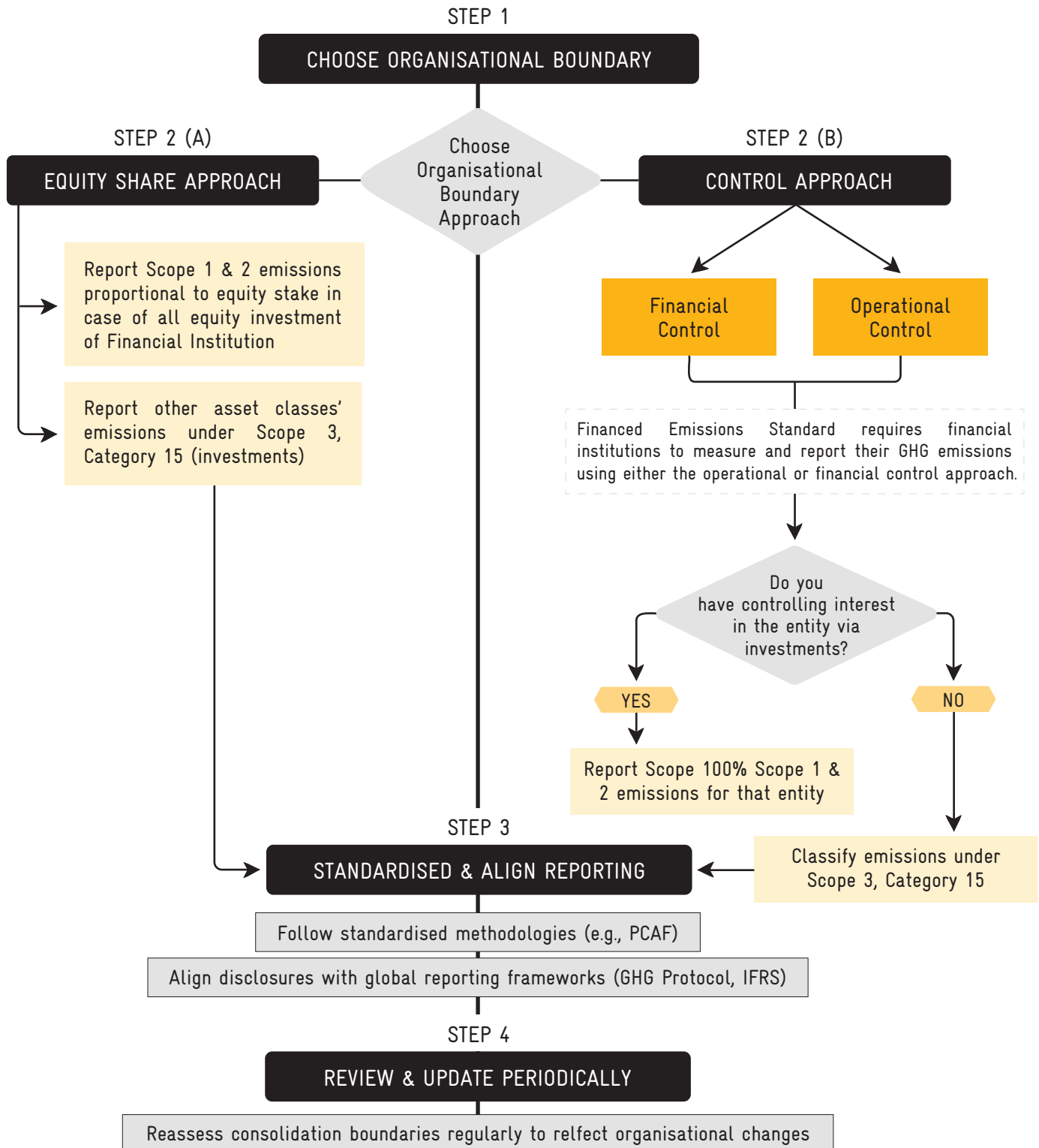
- i. **Financial Control:** the bank can direct financial and operating policies (e.g., majority shareholding).
- ii. **Operational Control:** the bank directs day-to-day operations, even without majority ownership.



Note: For most financial products—such as loans, bonds, and project finance—emissions are not consolidated into Scope 1 or Scope 2. Instead, they are categorized as Scope 3, Category 15 (investments) under the GHG Protocol. These represent the financial emissions that form the backbone of this handbook.

Figure 2.3

Figure 2.4 Consolidation Approach & Financed Emissions Accounting










2.3 How Can Attribution, Data Use, & Reporting Conventions Be Applied Consistently?

The Role of Asset Classes in Financed Emissions Accounting

In line with the PCAF Standard, financed emissions are calculated at the asset class level because each type of financial product has distinct characteristics, risk profiles, and data requirements. By categorising exposures into asset classes, banks can apply consistent attribution methods, improve comparability across institutions, and ensure transparency in reporting.

Each asset class differs in whether it typically represents known use of proceeds (e.g., project finance, vehicle loans) or unknown use of proceeds (e.g., corporate loans, sovereign debt). This classification affects the accuracy of emissions measurement and the level of data disclosure required.

Figure 2.5 presents an overview of the key asset classes recognised under PCAF, along with their definitions:

| | |
|---|--|
|  | LISTED EQUITY & CORPORATE BONDS Includes all on-balance-sheet listed corporate bonds and equity traded on a market. Typically for general corporate purposes, meaning emissions are estimated at the entity level. |
|  | BUSINESS LOANS & UNLISTED EQUITY Covers all on-balance-sheet loans, lines of credit, and equity exposures to businesses, nonprofits, or organisations not traded on a market. Usually general-purposes financing, requiring corporate-level emissions attribution. |
|  | PROJECT FINANCE Refers to on-balance-sheet loans or equity tied to specific projects or activities (e.g., power plants, renewable energy, transport infrastructure). Emissions are directly attributable to the project boundary. |
|  | COMMERCIAL REAL ESTATE (CRE) Includes loans for purchase or refinancing of commercial property and on-balance-sheet investments in CRE, where the bank does not have operational control. Can be treated as known or unknown depending on property data availability. |
|  | MORTGAGES (RESIDENTIAL REAL ESTATE) Consists of consumer loans for purchase or refinancing of residential properties, including single-family homes and small multifamily housing. Emissions linked to household energy use, often requiring proxies. |
|  | MOTOR VEHICLE LOANS Refers to loans or credit lines for businesses and consumers to finance motor vehicles. Emissions are calculated based on vehicle or fleet fuel efficiency data. |
|  | SOVEREIGN DEBT Includes sovereign bonds and loans of all maturities issued in domestic or foreign currency. Emissions are attributed using national GHG inventories. |

How Can Attribution, Data Use, and Reporting Conventions Be Applied Consistently?

Once the organisational boundary is set and asset classes are identified, the next step is to determine how much of a borrower’s or investee’s emissions should be attributed to the financial institution. This is done through the attribution factor, a core principle in both the GHG Protocol (Scope 3, Category 15) and the PCAF Standard.

Attribution ensures that banks only account for the proportional share of emissions linked to their financing or investment, rather than the full emissions of the borrower or project. This approach provides a fair, transparent, and comparable measure of financed emissions across different institutions and asset classes.

| PRINCIPLE OF ATTRIBUTION | | |
|--|---|--|
| <p>Proportional allocation: GHG emissions from loans and investments are allocated to the reported financial institution in proportion to its share of financing in the borrower or investee.</p> | <p>Annual emissions basis: Because attribution is linked to the borrower’s annual emissions, financed emissions must be reported at least annually, aligned with financial reporting cycles.</p> | <p>Consistent across asset classes: The same principle applies whether the bank holds equity, debt, or provides project finance—only the way the attribution factor is calculated changes by asset class.</p> |

$$\text{FINANCED EMISSIONS} = \sum_i \left(\frac{\text{Outstanding amount}_i}{\text{Total equity} + \text{debt}_i} \right) \times \text{Emissions}_i \quad (\text{with } i = \text{borrower or investee})$$

Figure 2.6

Where:

Attribution Factor represents the financial institution’s share of the borrower’s or project’s capital structure.

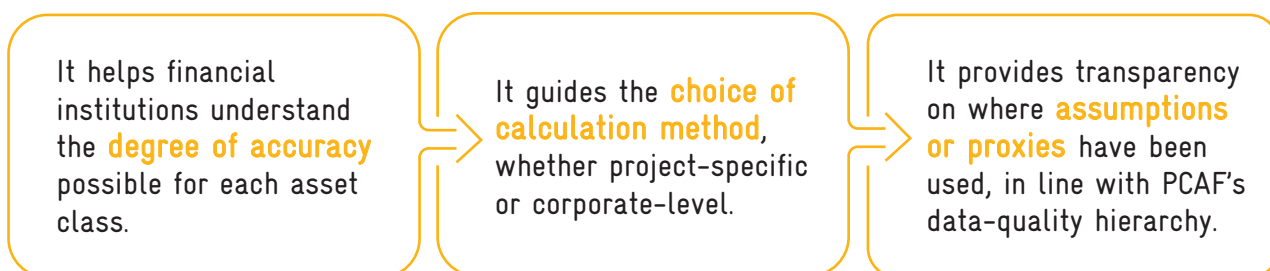
Emissions represent the total GHG emissions of the borrower, investee, or project (Scope 1 and 2, plus Scope 3 where available).

The concept of the attribution factor is explained in detail in Chapter 4

Data Identification and Availability

Once attribution factors are defined, the next step is to assess what data is available to calculate financed emissions. Data availability determines not only the choice of methodology but also the accuracy, precision, and comparability of results. In practice, the quality of data often varies widely across asset classes, sectors, and clients.

Evaluating data availability serves three purposes:



A key part of data identification is understanding the purpose of financing—whether funds are directed to a specific project or used for general corporate purposes. This classification shapes the emissions boundary and data collection process.

KNOWN USE OF PROCEEDS

Where financing is explicitly tied to a defined project or activity, emissions can be traced directly to that project. This allows more precise, attributable, and transparent reporting.

UNKNOWN USE OF PROCEEDS

Where financing is provided for general corporate purposes, emissions must be estimated at the entity level, typically using the borrower's total reported emissions or proxy data. This approach is broader, less precise, and often requires assumptions.

Notes for Banks:



- Always classify exposures as known or unknown use of proceeds before selecting a calculation method.
- Known use of proceeds offers higher precision but requires project-level data and monitoring; unknown use of proceeds is more common but less precise.
- Both approaches must be applied consistently and disclosed transparently, including data-quality scores and underlying assumptions.
- Combining this classification with taxonomy alignment (e.g., Pakistan Green Taxonomy) strengthens the credibility of sustainable finance claims and regulatory compliance.

The following table summarizes the main differences between known and unknown use of proceeds in financed emissions accounting:








| ASPECT | KNOWN USE OF PROCEEDS | UNKNOWN USE OF PROCEEDS |
|--|---|---|
| Emissions Measurement  | Calculated using emissions data from the particular project or asset (Scope 1, Scope 2, optionally Scope 3) | Estimated based on total emissions of the borrower or issuer at corporate/entity level. |
| Allocation Method  | Emissions allocated proportionally based on the bank's share of financing in the project. | Emissions allocated proportionally based on the bank's financing relative to the company's enterprise value or capital structure. |
| Accuracy and Precision  | More precise and directly attributable, allowing granular tracking of emissions. | Less precise; relies on aggregate data and proxies when detailed information is not available. |
| Use Case Examples  | Project finance loans for renewable energy, infrastructure projects, or specified green bonds. | Corporate loans, bonds, or equity financing where the use of funds is general or unspecified. |
| Challenges  | Requires access to detailed project-level emissions data. | Requires estimating emissions using general company data or sectoral averages, which may increase uncertainty. |
| Regulatory Guidance  | Supported by GHG Protocol Scope 3 Standard for project finance. | Covered by GHG Protocol and PCAF methodologies for "general corporate" instruments. |
| Transparency  | Higher transparency and clearer attribution in emissions reporting. | Requires clear assumptions and disclosures on estimation methods and limitations. |

Figure 2.7

Identify Relevant Asset Classes

Under the PCAF Standard, financed emissions must be measured across all material asset classes on a bank's balance sheet. Each asset class has its own attribution rules, data requirements, and degree of precision depending on whether the financing is linked to a known use of proceeds (e.g., project finance) or an unknown use of proceeds (e.g., corporate loans). This classification is critical, as it shapes the methodology for calculating emissions and determines how accurate or proxy-driven the results will be. For example, project finance exposures with clearly defined purposes can be traced to specific assets and yield higher-quality data, while general corporate loans typically rely on broader entity-level disclosures or proxies. Identifying relevant asset classes, and classifying them into known or unknown use of proceeds, allows banks to apply PCAF's asset-class-specific methodologies consistently and transparently across their portfolios.

Each bank's balance sheet contains a mix of financial instruments. Financed emissions must be calculated for all material asset classes, even if proxy data are required at the outset.

Asset Classes Relevant for Banks in Pakistan

| Asset Classes | Description | Relevance in Pakistan |
|-------------------------------------|---|--|
| Corporate Loans & Unlisted Equity | Loans and private equity exposures to corporates, including SMEs. | High relevance: textiles, cement, agriculture, and manufacturing dominate loan books. |
| Listed Equity & Corporate Bonds | Direct investments in publicly listed companies and bonds. | Moderate relevance: some banks hold listed securities through treasury or investment arms. |
| Project Finance | Financing tied to a specific project, often infrastructure or energy. | High relevance: power plants, renewable energy, transport, and infrastructure projects. |
| Commercial Real Estate | Loans secured by commercial property. | Growing exposure: malls, office buildings, industrial estates. |
| Mortgages (Residential Real Estate) | Retail housing loans secured against property. | Increasingly material: mortgage market expansion supported by SBP housing finance initiatives. |
| Sovereign Debt | Investments in government securities (T-bills, PIBs, Sukuk). | Very high: government securities account for a large share of bank assets. |

Figure 2.8

3

Methodology, Data Collection & Calculation of Financed Emissions

IN THIS SECTION:

- 3.1 Step 1: Identify Relevant Asset Classes
- 3.2 Step 2: Calculating Attribution Factors
- 3.3 Step 3: Selecting and Classifying Emissions Data Using the Data Quality Score
- 3.4 Step 4: Step-by-Step Financed Emissions Calculations (with Case Study/Example)
- 3.5 Step 5: Aggregating and Analyzing Portfolio-Level Results
- 3.6 Case Study

This chapter provides a structured methodology for calculating financed emissions, guiding Financial institutions from data collection to final computation. It explains how financial data serves as the foundation for attribution, introduces the use of standardised calculation approaches and integrates the Data Quality Score* as a measure of reliability and accuracy. By combining methodological clarity with practical tools, this section equips financial institutions to apply a consistent framework that enhances comparability, transparency and decision-making in financed emissions management.

Financed Emissions Calculation Methodology



Figure 3.1

* Data Quality Score is a measure of the reliability of emissions data. It ranges from Score 1 (highest quality, company-specific verified data) to Score 5 (lowest quality, based on proxy data).

3.1 Step 1: Identify Relevant Asset Classes

The method through which financed emissions are calculated varies either by the type of financing provided to the borrower or investee or by the known flow of the money (use of proceeds).

The first step is to select the type and source of financing provided.

| TYPE OF FINANCE AND SOURCE | | |
|--|---|--|
| Corporate Finance | Project Finance | Consumer Finance |
| Finance provided to companies, such as listed equity, corporate bonds, and business loans and equity investments in private companies (i.e., unlisted equity). | Financing provided to projects—such as energy, power, industrial, infrastructure, and agricultural projects—that rely primarily on the project's cash flow for repayment. | Finance provided to individual and household consumers, such as mortgages and motor vehicle loans. |

Figure 3.2 and Figure 3.3 are a starting point for banks to determine the appropriate asset class that is a prerequisite for the selection of calculation methodology of financed emissions. After identifying the type of finance, the next step is to determine the use of proceeds and the activity for which the financing is used.

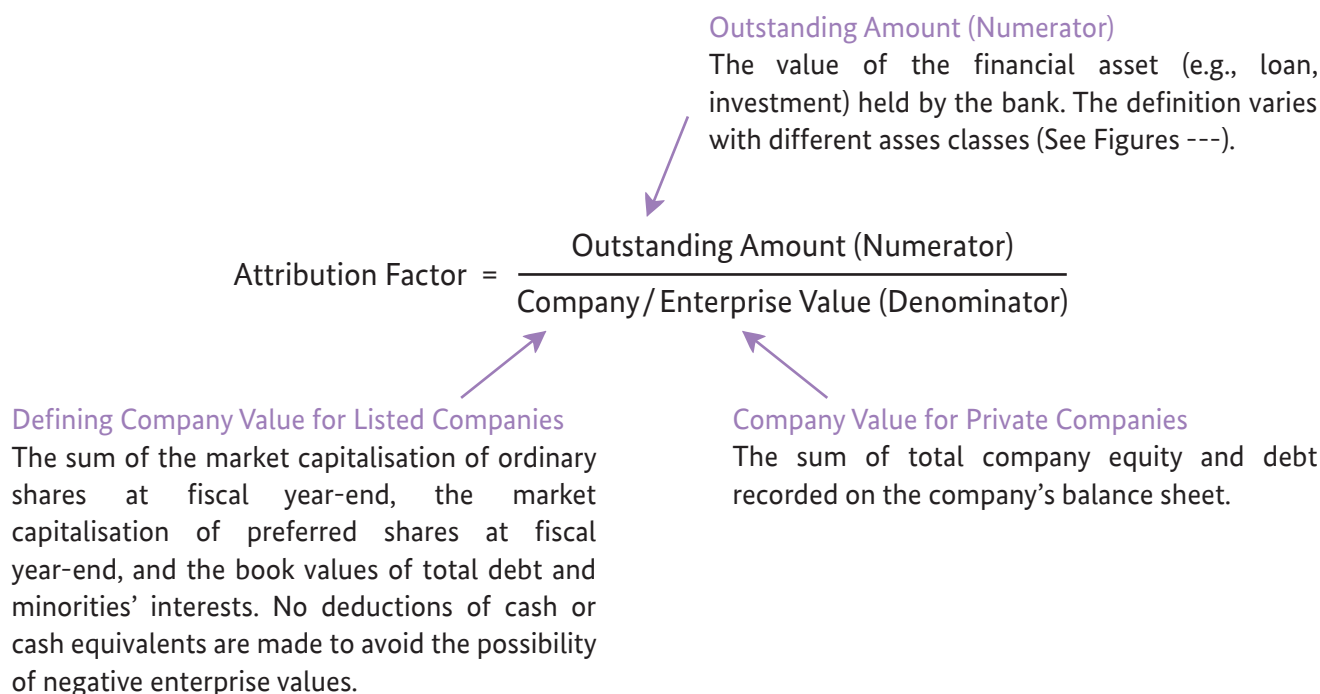


| Type of Financing and Source | | Use of Proceeds | Activity Sector | Asset Class (as defined by PCAF) |
|------------------------------|--------------------------------------|-----------------|-----------------|------------------------------------|
| Corporate Finance | Listed Equity (equity) | Unknown | All | Listed Equity and Corporate Bonds |
| | Corporate Bonds (debt) | Unknown | All | Listed Equity and Corporate Bonds |
| | | Known | All | Project Finance |
| | Equity in Private Companies (equity) | Unknown | All | Business Loans and Unlisted equity |
| | | Known | Real Estate | Commercial Real Estate |
| | Sovereign Debt | Unknown | All | Sovereign Debt |
| | Loans (debt) | Unknown | All | Business Loans and Unlisted equity |
| | | Known | All Other | Project Finance |
| | | | Real Estate | Commercial Real Estate |
| Project Finance | Equity and Loans (equity and debt) | Known | All | Project Finance |
| | | | | |
| Consumer Finance | Loans (debt) | Unknown | All | (Not Yet Developed by PCAF) |
| | | | All Other | |
| | | Known | Real Estate | Mortgages |
| | | | Motor Vehicles | Motor Vehicle Loans |

Figure 3.3

3.2 Step 2: Calculation of the attribution factor

The attribution factor determines what share of financed company's annual GHG emissions is allocated to a bank or financial institution.



Enterprise Value Including Cash (EVIC)

+
Market Cap or Preferred Shares
+
Book Value of Debt
+
Minority Interests

Illustrated example of a company's enterprise value including and excluding cash. Equity = 50, Debt = 50, Cash = 20.

| Approaches | Enterprise value | Attribution to equity | Attribution to debt | Total |
|--------------------------|------------------|-----------------------|---------------------|-------|
| EV excl. cash (standard) | 50+50-20 = 80 | 50/80 = 63% | 50/80 = 63% | >100% |
| EV incl. cash | 50+50 = 100 | 50/100 = 50% | 50/100 = 50% | 100% |

Figure 3.4

The PCAF applies the same general attribution principle across all asset classes even though the actual equations and underlying (financial) data sources might differ for each asset class. **The principle defines that the attribution factor for all asset classes is calculated by determining the attribution factor of the outstanding amount of a financial institution over the total equity and debt of the company, project, property, etc. in which the financial institution is invested.**

Figure 3.5 Numerator and Denominators per Asset Class

| Asset Class | Numerator (Outstanding Amount) | Denominator (Company Value) |
|--------------------------------------|--|--|
| Listed Equity | Market value of equity held | EVIC |
| Corporate Bonds | Book value of bond owed | EVIC |
| Private Company Bonds | Book value of bond owed | Total equity + total debt* |
| Private Equity | Ownership share x total equity | Investee's balance sheet equity |
| Business Loans | Outstanding loan (disbursed-repayments) | EVIC |
| Project Finance | Outstanding loan (disbursed-repayments) | Total project's equity and debt* |
| Commercial real estate and Mortgages | Outstanding loan (disbursed-repayments) | Total value of property at the time of origination |
| Motor Vehicle | Outstanding loan (disbursed-repayments) | Total value of vehicle at the time of origination |
| Sovereign debts | Exposure to Sovereign Bond (Exposure to government-issued debt securities) | PPP-adjusted GDP (GDP of country by dividing GDP by purchasing power parity) |

*Note: The total debt includes both current and long-term debt on the balance sheet.

Points to Note:



If the total debt or total equity cannot be obtained from a client's balance sheet (e.g., for some it might be difficult to obtain these values), financial institutions are allowed to fall back to the total balance sheet value (i.e., the sum of total equity and liabilities, which is equal to the client's total assets) with the intention of improving this data quality in the future.

Figure 3.6 Attribution Factor Formula for each Asset Class

| Asset Classes | Attribution Factors |
|------------------------------------|--|
| Listed Equity and Corporate Bonds | $\text{Attribution Factor}_C = \frac{\text{Outstanding Amount}}{\text{Enterprise Value including Cash}_C}$ <p>For bonds to private companies</p> $\text{Attribution Factor} = \frac{\text{Outstanding Amount}}{\text{Total Equity} + \text{Debt}_C}$ <p>C = borrower or investee company</p> |
| Business Loans and Unlisted Equity | $\text{Attribution Factor}_C = \frac{\text{Outstanding Amount}}{\text{Total Equity} + \text{Debt}_C}$ <p>For business loans to listed companies</p> $\text{Attribution Factor} = \frac{\text{Outstanding Amount}}{\text{Enterprise Value including Cash}_C}$ <p>C = borrower or investee company</p> |
| Project Finance | $\text{Attribution Factor}_C = \frac{\text{Outstanding Amount}}{\text{Total Equity} + \text{Debt}_P}$ <p>P = project</p> |
| Commercial Real Estate | $\text{Attribution Factor}_B = \frac{\text{Outstanding Amount}}{\text{Property value at the time of origination}_B}$ <p>B = building</p> |
| Mortgages | $\text{Attribution Factor}_B = \frac{\text{Outstanding Amount}}{\text{Property value at the time of origination}_B}$ <p>B = building</p> |
| Motor Vehicles | $\text{Attribution Factor}_V = \frac{\text{Outstanding Amount}}{\text{Total value at the time of origination}_V}$ <p>V = vehicle</p> |
| Sovereign Debts | $\text{Attribution Factor} = \frac{\text{Outstanding Amount}}{\text{PPP} - \text{adjusted GDP}}$ |

Points to Note:

- The attribution factor must be recalculated annually to reflect updated exposure
- EVIC ensures comparability across asset classes
- Outstanding exposure naturally reduces as loans are repaid or bonds mature
- The attribution factor calculation is, in principle, only possible for listed equity and corporate bonds where financial data specific to the borrower or investee is available. For listed equity and corporate bonds where such data is unavailable, the attribution factor cannot be calculated, but rough estimations on attribution can still be made based on region- and sector-specific average financial data and the outstanding amount

3.3 Step 3: Selecting and Classifying Emissions Data Using the Data Quality Score

The next step is to calculate emissions associated with each exposure. Institutions can choose different calculation approaches depending on data availability and reliability. Each option is linked to a data quality score, which provides a standardised measure of confidence in the results.

In order to ensure the internal and external stakeholders can make informed decisions, there is a need to ensure that the GHG accounting process accurately captures the emissions associated with their loans and investments, supporting informed decision-making for both internal and external stakeholders. To achieve this, institutions should utilise the highest quality data available for each asset class and commit to improving data quality over time.

While the PCAF acknowledges that high-quality data may be difficult to obtain—particularly for certain asset classes—this should not hinder institutions from initiating their financed emissions inventories. Even estimated or proxy data can reveal emission-intensive areas within portfolios, providing valuable insights for climate strategy development. Where data quality is limited, institutions are encouraged to adopt approaches that enhance data reliability over time.

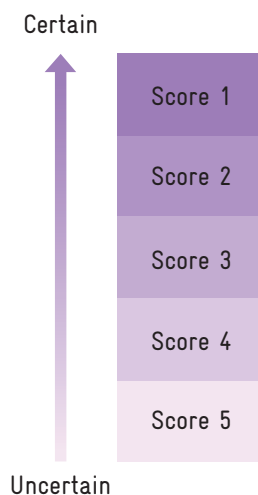
Data Challenge: Negative Equity in Client Balance Sheets (Pakistan Context)

In some cases, the total equity value of a company may be negative (e.g., due to large accumulated losses). When this occurs, the financial institution shall set equity = 0. As a result:

- All financed emissions are attributed to debt providers.
- No emissions are attributed to equity investments.

This approach mirrors PCAF treatment of listed companies, where the equity portion of EVIC (market capitalisation) already reflects retained earnings or losses.

Data quality scoring from 1 to 5...



...enables financial institutions to develop a strategy to improve data over time

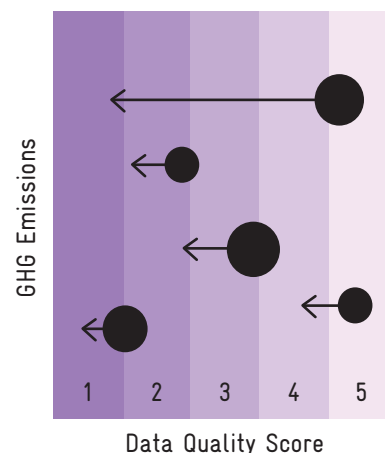


Figure 3.7



Fintech Startup – Pakistan

A fintech startup in Pakistan reports negative retained earnings, exceeding the value of other equity components. As a result, the company's total balance sheet equity is –PKR 50 million.

In this case, the equity value is set to zero for financed emissions calculations, and 100% of the emissions are attributed to the financial institution's debt exposure.

If the same company later becomes profitable and reports positive retained earnings, its equity value would increase. Consequently, a greater share of financed emissions would be attributed to equity holders, reflecting the updated financial structure.

3.3.1 Calculation Options and Their Corresponding Data Quality Scores

Financed emissions from all the seven asset classes can be calculated in different ways depending on the availability of financial and emissions data specific to the borrower and investee. Overall, PCAF distinguishes three different data-based calculation methodologies to calculate the financed emissions.

Option 1 REPORTED EMISSIONS:

Where verified or unverified emissions are directly collected from the borrower or investee company.

Potential Data Sources: a company sustainability report or indirectly via verified third-party data providers (e.g., CDP) and then allocated to the reporting financial institutions using the attribution factor.

Option 2 PHYSICAL ACTIVITY-BASED EMISSIONS:

Where emissions are estimated by the reporting financial institution based on primary physical activity data collected from the borrower or investee company.

Potential Data Sources: Megawatt-hours of natural gas consumed or tons of steel produced. The emissions data should be estimated using an appropriate calculation methodology or tool with verified emission factors expressed per physical activity (e.g., tCO₂e/MWh or tCO₂e/t of steel) issued or approved by a credible independent body.

Option 3 ECONOMIC ACTIVITY-BASED EMISSIONS:

Where emissions are estimated by the reporting financial institution based on economic activity data collected from the borrower or investee company.

Potential Data Sources: Euro/USD/PKR of revenue of Euro/USD of sectoral assets and then allocated to the reporting financial institution using the attribution factor. The emissions data should be estimated using official statistical data or acknowledged environmentally extended input-output (EEIO) tables providing region- or sector-specific average emission factors expressed per economic activity (e.g., tCO₂e/€ or \$ of sectoral assets).

Figure 3.8

Figure 3.9 to 3.12 summarise the calculation options and their corresponding Data Quality Scores for all the asset classes.

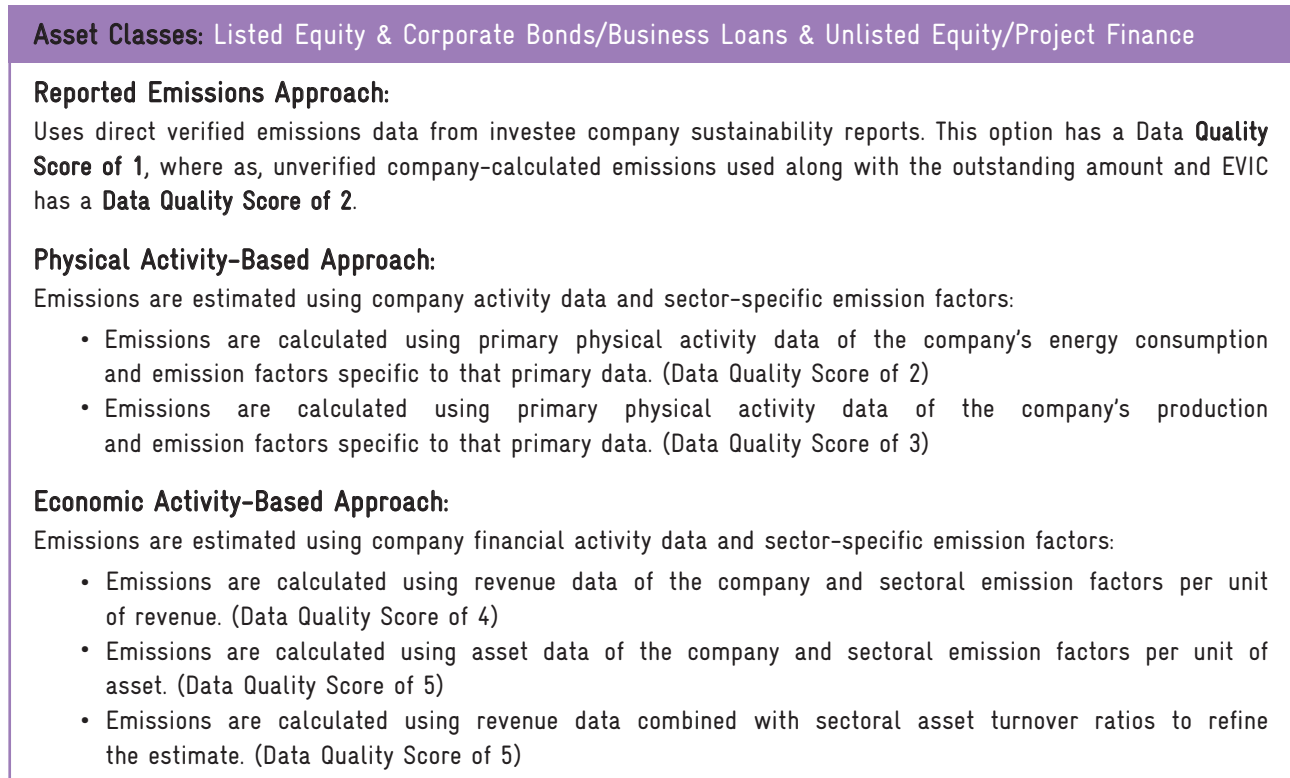


Figure 3.9

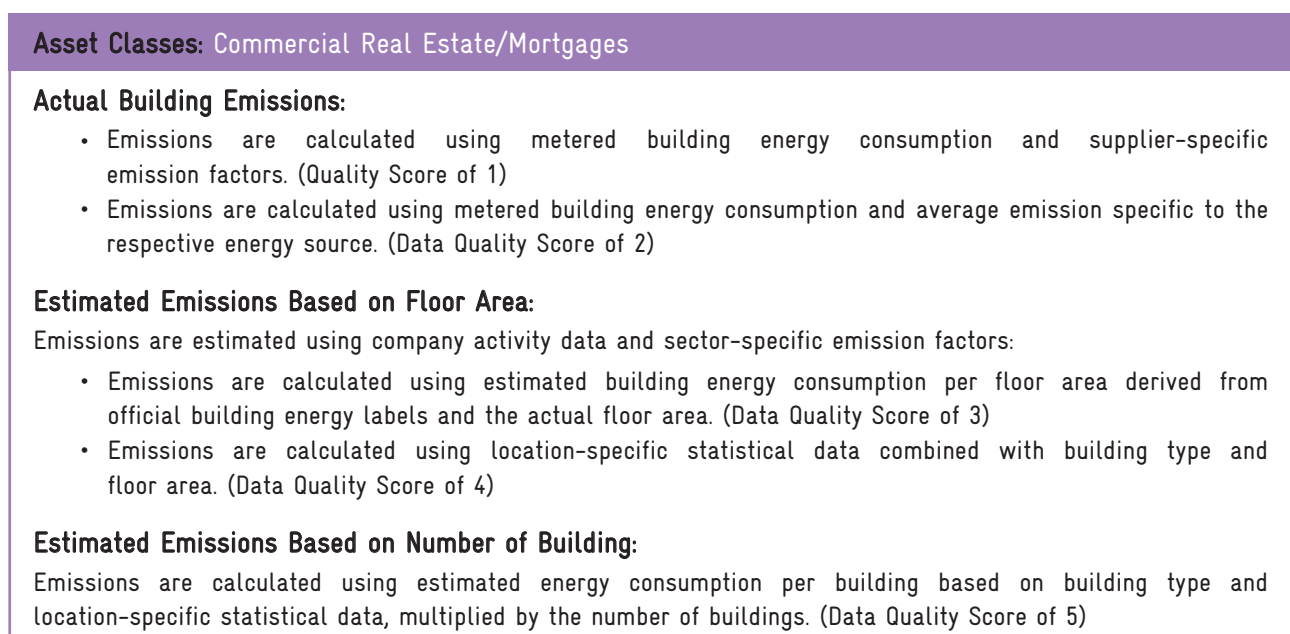


Figure 3.10

Asset Classes: Motor Vehicles**Actual Vehicle Emissions:**

- Emissions are calculated using actual vehicle fuel consumption and fuel-specific emissions factors. (Data Quality Score of 1)
- If actual fuel consumption is not available, but vehicle make, model, efficiency, fuel type and distance traveled are known, emissions are calculated using estimated fuel consumption and fuel-type specific emissions factors. (Data Quality Score of 1)

Estimated Vehicle-Specific Emissions:

- Emissions are calculated using vehicle efficiency, fuel type, and distance traveled estimated from local statistical data. (Data Quality Score of 2)
- Emissions are calculated using vehicle efficiency, fuel type, and distance traveled estimated from regional statistical data. (Data Quality Score of 3)

Estimated Vehicle-Unspecific Emissions:

- If the vehicle type is known (but make and model are unknown), and distance traveled is estimated using local or regional data, emissions are calculated using estimated fuel consumption and fuel-type specific emission factors. (Data Quality Score of 4)
- If neither vehicle make, model, nor type is known and only an average vehicle profile is used, with distance traveled estimated from local or regional data, emissions are calculated using estimated fuel consumption and fuel-specific emission factors. (Data Quality Score of 5)

Figure 3.11

Asset Classes: Sovereign Debts**Reported Emissions:**

- Emissions are taken directly from country-level reporting. If verified GHG emissions are available and reported by the country to the UNFCCC, these are used as the emissions basis. (Quality Score of 1)
- Alternatively, if only unverified emissions data is available, these are used instead. (Data Quality Score of 2)

Physical Activity-Based Estimates:

- When reported GHG emissions of a country are not available, emissions are calculated using primary physical activity data. This includes the country's total energy consumption (both domestically generated and imported), combined with emission factors specific to that energy source. (Data Quality Score of 3)

Economic Activity-Based Estimates:

- When reported GHG emissions of a country are not available, emissions are calculated using sectoral revenue data from the country's production, combined with emission factors specific to that revenue data. (Quality Score of 4)
- When reported or activity-based GHG emissions are not available, emissions are estimated using proxy data. In this case, emissions from a similar country (based on factors such as climate zone, wealth, or GDP) are used as the basis to estimate the country's GHG emissions. (Data Quality Score of 5)

Figure 3.12

3.4 Step-by-Step Financed Emissions Calculations (with Case Study/Example)

The financed emissions of a loan or investment in a company are calculated by multiplying the attribution factor by the emissions of the respective borrower or investee company. The following table presents the financed emissions equations for each asset class.








| Asset Classes | Equations to calculate financed emission |
|---|---|
|  Listed Equity and Corporate Bonds | Financed emissions = Attribution factor _C x Company emissions _C C = borrower or investee company |
|  Business Loans and Unlisted Equity | Financed emissions = Attribution factor _C x Company emissions _C C = borrower or investee company |
|  Project Finance | Financed emissions = Attribution factor _P x Project emissions P = project |
|  Commercial Real Estate | Financed emissions = Attribution factor _B x Building emissions _B B = building |
|  Mortgages | Financed emissions = Attribution factor _B x Building emissions _B B = building |
|  Motor Vehicles | Financed emissions = Attribution factor _V x Vehicle emissions _V Vehicle emissions _V = Distance traveled _B Efficiency _{V,F} x Emission factor _F V = vehicle F = fuel type |
|  Sovereign Debts | Financed emissions = $\frac{\text{Outstanding Amount}}{\text{PPP - adjusted GDP}}$ x Sovereign emissions _S S = sovereign borrower |

Figure 3.13

3.5 Step 5: Emissions Intensity per million – aggregation of portfolio

While robust methodologies such as PCAF ensure consistent calculation of financed emissions, numbers alone are not enough. Financial institutions must embed these insights into their broader risk management frameworks. This is where Environmental and Social Risk Management (ESRM) becomes critical—ensuring that financed emissions are not only measured, but actively managed through due diligence, client engagement, and monitoring mechanisms aligned with the State Bank of Pakistan’s regulatory requirements. (See Chapters 4 and 5)

3.5 Step 5: Aggregating & Analyzing Portfolio-Level Results

Economic Emission Intensity (EEI) serves as a key performance indicator that translates the absolute financed emissions of a portfolio into a relative metric of carbon efficiency. It expresses the quantity of greenhouse gas (GHG) emissions (tCO₂e) financed per unit of economic exposure—typically per million rupees invested or loaned. This allows financial institutions to normalise emissions data, compare performance across asset classes, and track decarbonisation progress over time.

The equation for calculating Economic Financed Emissions:

$$\text{Emission Intensity} = \frac{\text{Financed Emissions (tCO}_2\text{e)}}{\text{Outstanding Amount of Loan or Investment (PKR, USD or other currency)}}$$

Where:

Financed Emissions (tCO₂e): The portion of a borrower or investee's total GHG emissions attributed to the financial institution, based on the PCAF attribution factor.

Outstanding Amount: The current value of the loan or investment exposure to that client, sector, or portfolio.



Illustrated Case Example

A commercial bank in Pakistan calculates its portfolio-level **emission intensity** using the PCAF methodology. The bank's total **financed emissions** amount to **60,000 tCO₂e**, while the **total loan and investment portfolio** stands at **PKR 30,000 million**.

According to the PCAF formula:

$$\text{Emission Intensity} = \frac{60,000}{30,000} = 2.0 \text{ tCO}_2\text{e per PKR million}$$

This means that, on average, the bank finances 2 tonnes of CO₂e for every PKR 1 million invested or loaned. Tracking this metric annually enables the bank to assess whether its portfolio is becoming more carbon efficient over time and to benchmark its progress against both local peers and international decarbonisation pathways.

3.6 Case Study



Green Trust Bank Ltd. – Pakistan

Overview

Green Trust Bank Ltd., a commercial bank headquartered in Lahore and established in 2010, has initiated the measurement of climate-related risks across its lending and investment portfolio. This effort marks a significant step toward integrating environmental considerations into financial decision-making.

Methodology

The Bank is applying the PCAF methodology for quantifying financed emissions linked to financial activities. This approach enables the Bank to assess its climate risk exposure and understand the potential impact on portfolio performance.

This initiative is aligned with:

- Pakistan's Green Banking Guidelines
- The country's Nationally Determined Contributions (NDCs)
- Increasing regulatory and market expectations for environmental accountability in the financial sector

Portfolio Categorisation

To ensure a standardised and transparent approach, the Bank has categorised its portfolio into asset classes consistent with the PCAF framework. This classification supports accurate measurement and reporting of financed emissions.

Next Steps

The case examples illustrate how financed emissions are calculated across different asset classes within the Bank's portfolio using the 4 step approach.

ACTIVITY 1

Green Trust Bank Ltd. has invested in PakPro Ltd., a major cement manufacturer based in Pakistan. PakPro has disclosed its Scope 1, Scope 2, and Scope 3 greenhouse gas (GHG) emissions in its sustainability report, in alignment with the GHG Protocol Corporate Standard. These disclosures have been independently verified by a third-party auditor, qualifying them as Data Quality Score (DQS) 1

- Investment Value: PKR 1 billion (Financial Statement of bank)
- EVIC: PKR 10 billion (Information from investee)

Investee's Emissions

- Scope 1 Emissions: 350,000 tCO₂e/year
- Scope 2 Emissions: 100,000 tCO₂e/year
- Scope 3 Emissions: 200,000 tCO₂e/year

Steps

STEP 1
Select Asset
Class



STEP 2
Calculate
Attribution Factor



STEP 3
Determine
Data Quality



STEP 4
Calculate the
Financed Emissions

Formulas

$$\text{Attribution Factor}_c = \frac{\text{Outstanding Amount}}{\text{Enterprise Value including Cash}_c}$$

$$\text{Financed emissions} = \text{Attribution factor}_c \times \text{Company emissions}_D$$

Calculations

| TYPE OF ASSET CLASS | Listed Equity | |
|--|---------------|---|
| OUTSTANDING AMOUNT (in PKR million) | A | 1000 |
| EVIC (in PKR million) | B | 10000 |
| ATTRIBUTION FACTOR | A / B = C | 0.1 |
| TYPE OF DATA AVAILABLE | DQS = 1 | The bank applied Option 1: Reported Emissions to calculate emissions which corresponds to a DQS of 1 |
| TOTAL EMISSIONS | D | 650,000 |
| FINANCED EMISSIONS | CXD | 65,000 |

ACTIVITY 2

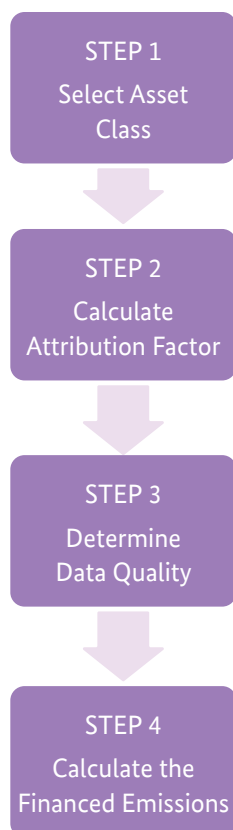
Green Trust Bank Ltd. has acquired bonds issued by Starbridge Technologies Inc., a U.S.-based company. The company has disclosed its greenhouse gas (GHG) emissions based on actual energy consumption and operational data. The company has also invested in emission removal projects, including wind energy and forestry initiatives. As the use of proceeds is not specified, this exposure is classified under the corporate bonds asset class, and the associated emissions have been allocated accordingly in line with the PCAF methodology.

- Outstanding Amount: 30 billion (Financial Statement of bank)
- Total Company Debt & Equity: PKR 70 billion (Information from investee)

Investee's Emissions

- Scope 1 Emissions: 250,000 tCO₂e / year
- Scope 2 Emissions: 100,000 tCO₂e / year
- Scope 3 Emissions: 150,000 tCO₂e / year
- Emission removal: 20,000 tCO₂e

Steps



Formulas

$$\text{Attribution Factor}_C = \frac{\text{Outstanding Amount}}{\text{Total Equity} + \text{Debt}_C}$$

$$\begin{aligned} \text{Financed emissions} &= \text{Attribution factor}_C \times \text{Company emissions}_D \\ \text{Emission removal} &= \text{Attribution factor}_C \times \text{Company emissions removal} \end{aligned}$$

Calculations

| TYPE OF ASSET CLASS | Corporate Bonds | |
|--|-----------------|---|
| OUTSTANDING AMOUNT (in PKR million) | A | 30,000 |
| DEBT + EQUITY | B | 70,000 |
| ATTRIBUTION FACTOR | A+B = C | 0.428 |
| TYPE OF DATA AVAILABLE | DQS = 1 | The bank applied Option 1: Reported Emissions to calculate emissions which corresponds to a DQS of 1 |
| TOTAL EMISSIONS / COMPANY EMISSIONS | D | 500,000 |
| FINANCED EMISSIONS | CXD | 214,000 |
| EMISSIONS REMOVAL | CX20000 | 8580 |

ACTIVITY 3

Green Trust Bank Ltd. has provided a loan to Indus Textile Pvt. Ltd., a privately held textile manufacturer specializing in fabric and apparel production. The company has not disclosed quantified Scope 1, Scope 2, or Scope 3 greenhouse gas (GHG) emissions.

- Outstanding Amount: PKR 2 billion (Financial Statement of bank)
- Annual Revenue: PKR 5 billion
- Total Equity & Debt: PKR 10 billion (Information from investee)
- Emission intensity Factor: Based on EEIO: 0.396kgCO₂e / 2022 USD (Code: 313300)

Steps

STEP 1
Select Asset
Class



STEP 2
Calculate
Attribution Factor



STEP 3
Determine
Data Quality



STEP 4
Calculate the
Financed Emissions

Formulas

$$\text{Attribution Factor}_c = \frac{\text{Outstanding Amount}}{\text{Total Equity} + \text{Debt}_c}$$

Conversion (Average Exchange Rate)
1USD = 278 PKR
5,000,000,000 / 278.4223 PKR =
17,958,332USD

Emissions are divided by 1,000 in
the calculation to convert the result from
kilograms of CO₂e to tonnes of CO₂e
(tCO₂e)

$$\text{Financed emissions} = \text{Attribution factor}_c \times \text{Total emissions}_f$$

Calculations

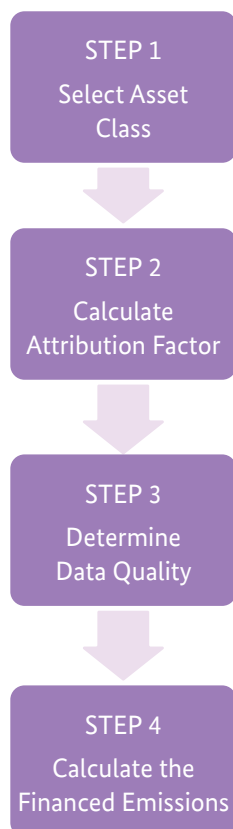
| TYPE OF ASSET CLASS | Unlisted Equity and Business Loans | |
|--|---|--|
| OUTSTANDING AMOUNT (in PKR million) | A | 2000 |
| EQUITY + DEBT (in PKR million) | B | 10000 |
| ATTRIBUTION FACTOR | A + B = C | 0.2 |
| TYPE OF DATA AVAILABLE | Due to the unavailability of physical activity data, emissions are being estimated using Option 3: Economic activity-based approach which corresponds to DQS of 4 | |
| REVENUE (in USD) | D | 17,958,332 |
| EMISSIONS INTENSITY FACTOR | E | 0.396 KgCO ₂ e / 2022USD |
| TOTAL EMISSIONS 0.396 KgCO ₂ e / 2022USD | F = DxE / 1000 | 7111 |
| FINANCED EMISSIONS | CXF | 1422 |

ACTIVITY 4

Green Trust Bank Ltd. has extended finance to Sindh Gas Power Ltd., last year for the construction and operation of a gas-fired power plant. Since the use of proceeds is clearly and exclusively tied to the development and operation of this specific generation asset, this exposure qualifies under the Project Finance in line with the PCAF methodology.

- Outstanding Amount: PKR 6.5 billion (Financial Statement of Bank)
- Total Project Value: PKR 7 billion
- Construction Emissions = 82,688 tCO₂e
- Operational emissions (annual) = 64,488 tCO₂e

Steps



Formulas

$$\text{Attribution Factor}_p = \frac{\text{Outstanding Amount}}{\text{Total Equity} + \text{Debt}_p}$$

Construction + Operational Emissions

$$\text{Financed emissions} = \text{Attribution factor}_p \times \text{Project emissions}$$

Calculations

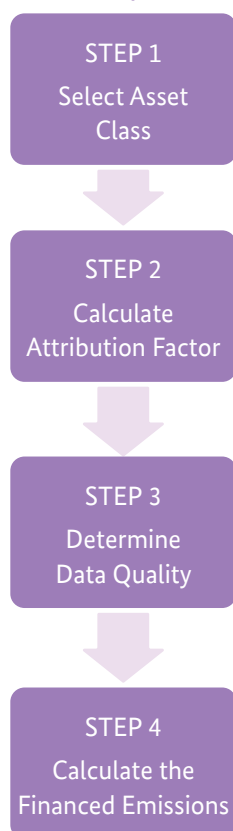
| | | |
|--|---|-----------------|
| TYPE OF ASSET CLASS | | Project Finance |
| OUTSTANDING AMOUNT (in PKR million) | A | 6,500 |
| EQUITY + DEBT (in PKR million) | B | 7,000 |
| ATTRIBUTION FACTOR | A / B = C | 0.9286 |
| TYPE OF DATA AVAILABLE | The bank applied Option 1 – Reported Emissions, corresponding to a Data Quality Score of 2, as the emissions are derived from project-reported data and are based on unverified Emissions of the project. | |
| PROJECT EMISSIONS (tCO ₂ e) | D | 147,176 |
| FINANCED EMISSIONS (tCO ₂ e) | CXD | 136,668 |

ACTIVITY 5

Green Trust Bank Ltd. has exposure to Habib Property Developers, which owns five buildings located in Karachi's Central Business District (CBD). In the absence of detailed metered utility data for individual tenants or floors, the annual energy consumption of these buildings is estimated using total floor area as the basis for calculation

- Outstanding Loan: PKR 2.7 billion (Financial Statement of bank)
- Property Value: PKR 4.5 billion (Financial Statement of bank)
- Total Area: 200,000 m²
- Average Electricity Intensity: 180 kWh/m²/year
- Total Energy Intensity : 200,000 × 180 = 36,000,000 kWh/year
- Emission Factor: 359 gCO₂/kWh

Steps



Formulas

$$\text{Attribution Factor}_B = \frac{\text{Outstanding Amount}}{\text{Property value at the time of origination}_B}$$

Emissions are divided by 1,000,000 to convert from grams of CO₂e (tCO₂e)

$$\text{Financed emissions} = \text{Attribution factor}_B \times \text{Total emissions}_F$$

Calculations

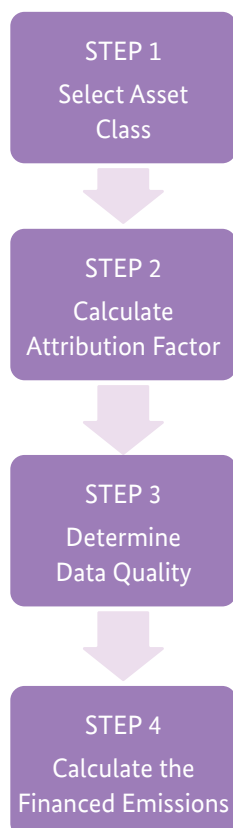
| TYPE OF ASSET CLASS | Commercial Real Estate | |
|--|--|-------------------------------------|
| OUTSTANDING AMOUNT (in PKR million) | A | 2,700 |
| EQUITY + DEBT (in PKR million) | B | 4,500 |
| ATTRIBUTION FACTOR | A / B = C | 0.6 |
| TYPE OF DATA AVAILABLE | As actual consumption data is unavailable, emissions for this property are calculated using Option 2, which estimates building emissions based on floor area, which corresponds to a DQS of 3. | |
| ENERGY PRODUCTION | D | 36,000,000 kWh/m ² /year |
| EMISSION INTENSITY FACTOR | E | 0.359 KgCO ₂ e/KWg |
| TOTAL EMISSIONS | F = DxE / 1000000 (tCO ₂ e) | 12,924 |
| FINANCED EMISSIONS | CXF | 7,754 |

ACTIVITY 6

A loan has been extended to Mr. Ahsan Ali for the purchase of four residential properties, each measuring 10 Marla and located in an urban area. The estimated annual electricity consumption across these properties is 9,000 kWh, which is used to calculate Scope 2 emissions.

- Property Value: PKR 80 million (Financial Statement of bank)
- Outstanding Amount: PKR 70 million (Financial Statement of bank)
- Electricity Consumption: 9000 kWh
- Emission Factor: 359 gCO₂/kWh¹

Steps



Formulas

$$\text{Attribution Factor}_b = \frac{\text{Outstanding Amount}}{\text{Property value at the time of origination}_b}$$

Emissions are divided by 1,000,000 to convert from grams to tonnes of CO₂e (tCO₂e)

$$\text{Financed emissions} = \text{Attribution factor}_c \times \text{Total emissions}_f$$

Calculations

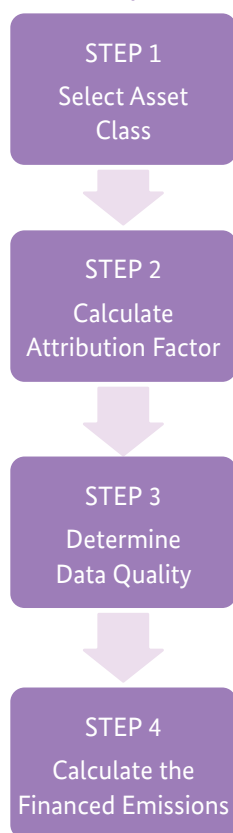
| TYPE OF ASSET CLASS | | Mortgages |
|--|--|-------------------------------|
| OUTSTANDING AMOUNT (in PKR million) | A | 70 |
| EQUITY + DEBT (in PKR million) | B | 80 |
| ATTRIBUTION FACTOR | A / B = C | 0.875 |
| TYPE OF DATA AVAILABLE | In line with the PCAF methodology for residential mortgages, financed emissions will be calculated using Option 4: Actual building emissions, as the estimate closely reflects actual energy usage which corresponds to a DQS of 2 | |
| ENERGY PRODUCTION | D | 9,000 kWh |
| EMISSION INTENSITY FACTOR | E | 0.359 KgCO ₂ e/KWg |
| TOTAL EMISSIONS | F = DxE / 1000000 (tCO ₂ e) | 3.231 |
| FINANCED EMISSIONS | CXF | 2.83 |

ACTIVITY 7

The bank has financed seven light commercial vehicles. The calculation is based on vehicle type, estimated mileage, and DEFRA emission factors, allowing for a more accurate estimate of Scope 3 emissions associated with the use of the financed vehicles.

- Vehicles Value: PKR 50 million (Financial Statement of bank)
- Annual Distance Travelled: 3,000km per Vehicle
- Total distance Travelled : 3000 × 7 = 21,000km
- Fuel Type: Petrol
- Fuel Efficiency: 13 km/liter
- Emission Factor: 2.37372 kg CO₂e/km (From DEFRA)
- Outstanding Loan: PKR 35 million (Financial Statement of bank)

Steps



Formulas

$$\text{Attribution Factor}_v = \frac{\text{Outstanding Amount}}{\text{Property value at the time of origination}_c}$$

Emissions are divided by 1,000,000 to convert the result from grams to tonnes of CO₂e (tCO₂e)

$$\text{Financed emissions} = \text{Attribution factor}_c \times \text{Total emissions}_f$$

Calculations

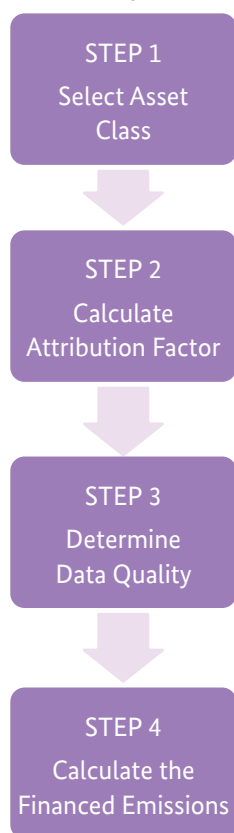
| TYPE OF ASSET CLASS | Motor Vehicles | |
|--|--|--------------------------------|
| OUTSTANDING AMOUNT (in PKR million) | A | 35 |
| EQUITY + DEBT (in PKR million) | B | 50 |
| ATTRIBUTION FACTOR | A / B = C | 0.7 |
| TYPE OF DATA AVAILABLE | Emissions from these vehicles are estimated using Option 2: Estimated Vehicle-Specific Emissions, as actual fuel consumption data is not available; however, average annual mileage and vehicle specifications are known which corresponds to a DQS of 3 | |
| TOTAL DISTANCE TRAVELED | D | 21000Km |
| EMISSION INTENSITY FACTOR | E | 2.37372 KgCO ₂ e/Km |
| TOTAL EMISSIONS | F = DxE / 1000000 (tCO ₂ e) | 49.8 |
| FINANCED EMISSIONS | CXF | 34.86 |

ACTIVITY 8

The bank holds sovereign debt issued by the Government of Pakistan, classified under treasury bills. To calculate financed emissions, the bank applies the PCAF methodology for sovereign debt, which uses the proportion of the bank's investment relative to the country's GDP, multiplied by national greenhouse gas (GHG) emissions.

- Instrument Type: T Bills
- Investment Value: PKR 250,000,000 (Financial Statement of bank)
- Country GDP: PKR 106,045 billion¹
- GHG Emissions: 489.87 MtCO₂e/year²
- Currency: PKR
- Outstanding Investment: PKR 200,000,000

Steps



Formulas

$$\text{Financed emissions} = \frac{\text{Outstanding Amount}}{\text{PPP - adjusted GDP}} \times \text{Sovereign emissions}$$

Calculations

| TYPE OF ASSET CLASS | Sovereign Debts | |
|--|---|-------------|
| OUTSTANDING AMOUNT (in PKR million) | A | 200 |
| GDP | B | 106,045,000 |
| EMISSIONS | C | 489,870,000 |
| TYPE OF DATA AVAILABLE | Since national emissions data is available, emissions for sovereign debt are calculated using Option 1: the Reported Emissions Approach which corresponds to a DQS of 1 | |
| FINANCED EMISSIONS | (A/B) x C | 924 |

¹ finance.gov.pk/survey

² Pakistan Updated NDC

Calculation of Emissions Intensity for the Portfolio of Green Trust Bank Limited

Following table provides a breakdown of financed emissions across different asset classes in the bank's portfolio. For each activity, the outstanding loan and investment exposure is presented alongside the associated Scope 1 & 2 and Scope 3 greenhouse gas (GHG) emissions. Emissions intensity is expressed as financed emissions per million invested, enabling comparability across asset classes.

| | Activity | Outstanding Loan and Investment (Million) | Scope 1 + 2 emissions (tCO ₂ e) | Scope 3 emissions (tCO ₂ e) | Emission Intensity (tCO ₂ e)/Rs | Weighted data quality score |
|---|---|---|--|--|--|-----------------------------|
| 1. Carbon-Intensive Asset Classes | Listed Equity and Corporate Bonds | 31,000 | 195,150 | 84,350 | 9.016 | 1 |
| | Business Loans and Unlisted Equity | 2,000 | 1,422 | | 0.711 | 4 |
| 2. Moderate- to Low-Intensity Asset Classes | Project Finance | 6,500 | 136,668 | | 21.026 | 2 |
| | Commercial Real Estate | 2,700 | 7,754 | | 2.87 | 3 |
| 3. Carbon Removals & Offsets | Mortgages | 70 | 7.85 | | 0.112 | 2 |
| | Motor Vehicle Loans | 35 | 12.355 | | 0.353 | 3 |
| | Sovereign Debts | 200 | 925 | | 4.625 | 2 |
| | Emission removal from Forestry and wind project | | | 8560 (tCO ₂ e) | | |

Actions Green Trust Bank can take include:

- Develop a transition plan focusing transition-aligned investment strategies
- Engagement with investees
- Portfolio rebalancing towards asset classes which demonstrate comparatively low emissions intensity, lower emissions intensity sources: Motor vehicle loans, Business Loans & Unlisted Equity and Mortgages
- The portfolio also reflects the impact of emission removal from forestry and wind projects amounting to 8,560 tCO₂e, along with the generation of 166.5 tCO₂e in certified carbon credits, which are reported separately in line with the PCAF methodology

Note to Banks:

Calculating financed emissions can enable insights to guide portfolio management by shifting capital toward lower-intensity asset classes, strengthening disclosure requirements, and setting portfolio-level decarbonization targets that specifically address high-intensity exposures. Aligning these actions with the Nationally Determined Contributions (NDCs), the Green Taxonomy, and Green Banking Guidelines further ensures that portfolio decisions not only reduce financed emissions but also contribute directly to country-level climate commitments and sustainable finance objectives.

4

Environment & Social Due Diligence

IN THIS SECTION:

- 4.1 Applying the Environmental and Social Risk Management (ESRM) Framework
- 4.2 Environment and Social Due Diligence Flow Chart



An Environmental and Social Risk Management (ESRM) system complements the financed emissions framework by embedding climate-related and environmental risks into a financial institution's core business processes. While financed emissions provide a quantitative baseline for portfolio climate impact, ESRM ensures these risks are systematically identified, assessed, and managed within the bank's risk governance framework.

The implementation of an Environmental and Social Risk Management (ESRM) system requires a structured approach that aligns with the institution's overall risk management framework.

Figure 4.1 outlines the key components of ESRM

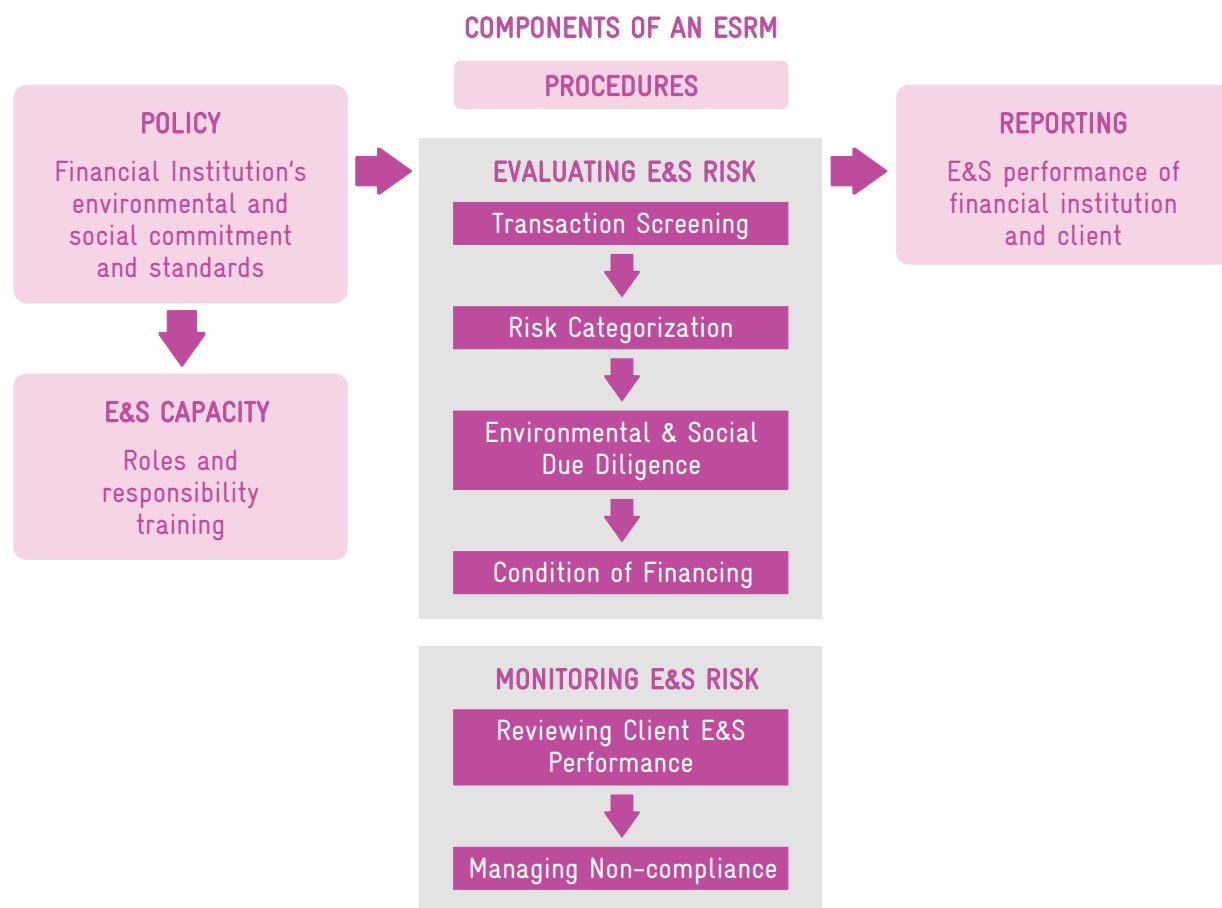


Figure 4.2 Environmental and Social Due Diligence Flow Chart

Conducting an environmental and social due diligence (ESDD) on transactions is a critical component of a bank environmental and social risk management system and its outcome should be factored into the decision-making process for proceeding with a transaction. The purpose of ESDD is to review any potential E&S risk associated risk with business activities of potential borrower to ensure that the transaction does not carry E&S risk which could present a potential liability or risk to the bank.

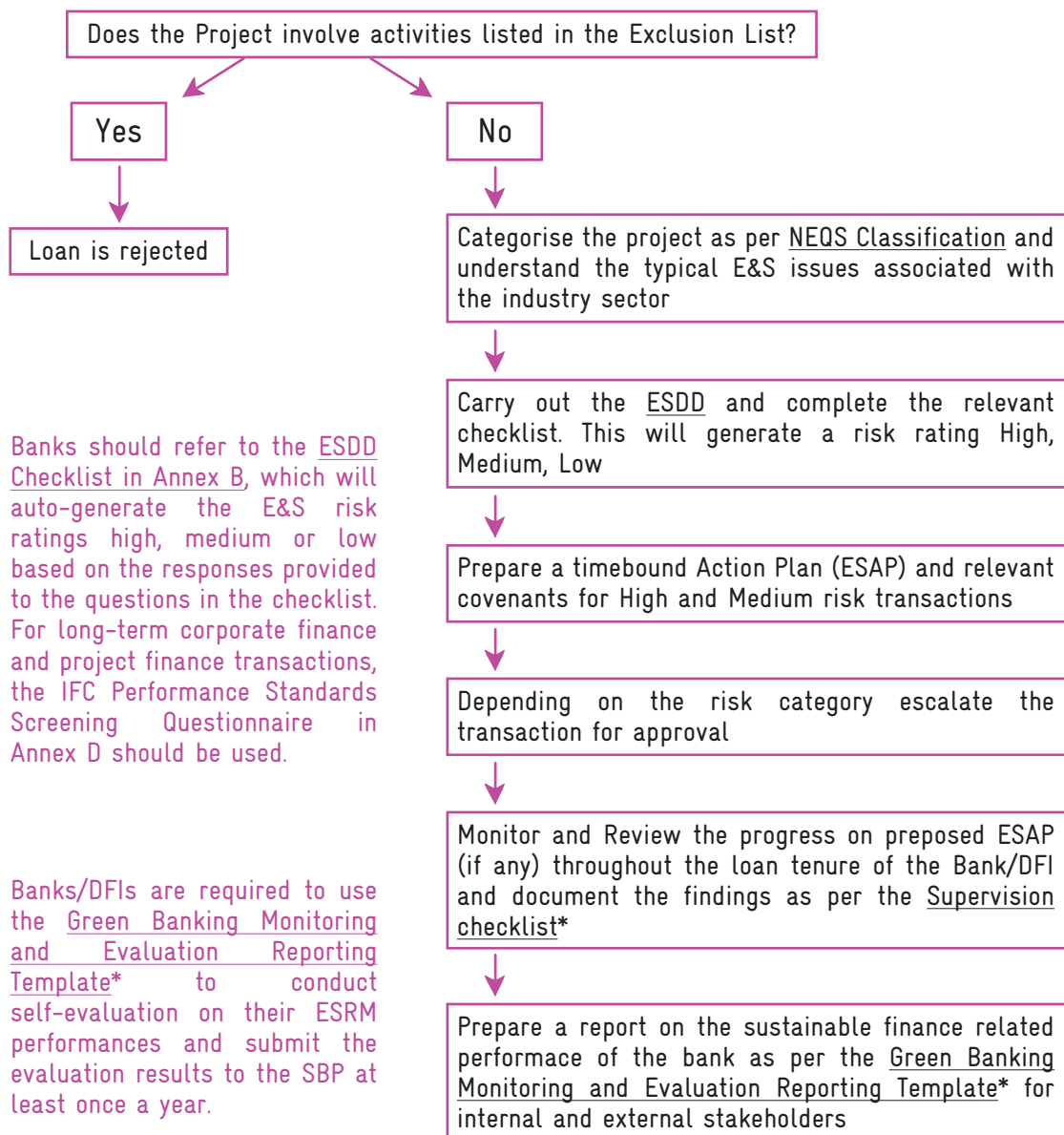


Figure 4.2

5

Pakistan Green Taxonomy (PGT)

IN THIS SECTION:

- 5.1 Sectors and economic activities
- 5.2 Screening criteria
- 5.3 Textile industry under Pakistan Green Taxonomy
- 5.4 Linking PGT classification with PCAF financed emissions results

The Pakistan Green Taxonomy, developed with technical assistance from the World Bank, approved in August 2025, represents a landmark step in aligning the country’s financial system with its climate and sustainable development objectives. It provides banks, development finance institutions (DFIs), and capital market participants with a nationally defined classification system for green and sustainable activities. By setting out clear criteria for what qualifies as “green,” “transition,” or “non-aligned,” the PGT enables transparency, comparability, and credibility in sustainable finance.

While global standards such as the GHG Protocol and the Partnership for Carbon Accounting Financials (PCAF) provide robust methodologies to measure financed emissions, they do not determine whether an activity is sustainable. This is where the PGT fills a critical gap:

- PCAF measures the “how much” (GHG emissions financed).
- PGT defines the “what” (whether activities are green, transitional, or non-aligned).

Together, these frameworks allow Pakistani banks to quantify their climate impact and classify their portfolios in line with both global best practice and local regulatory expectations.

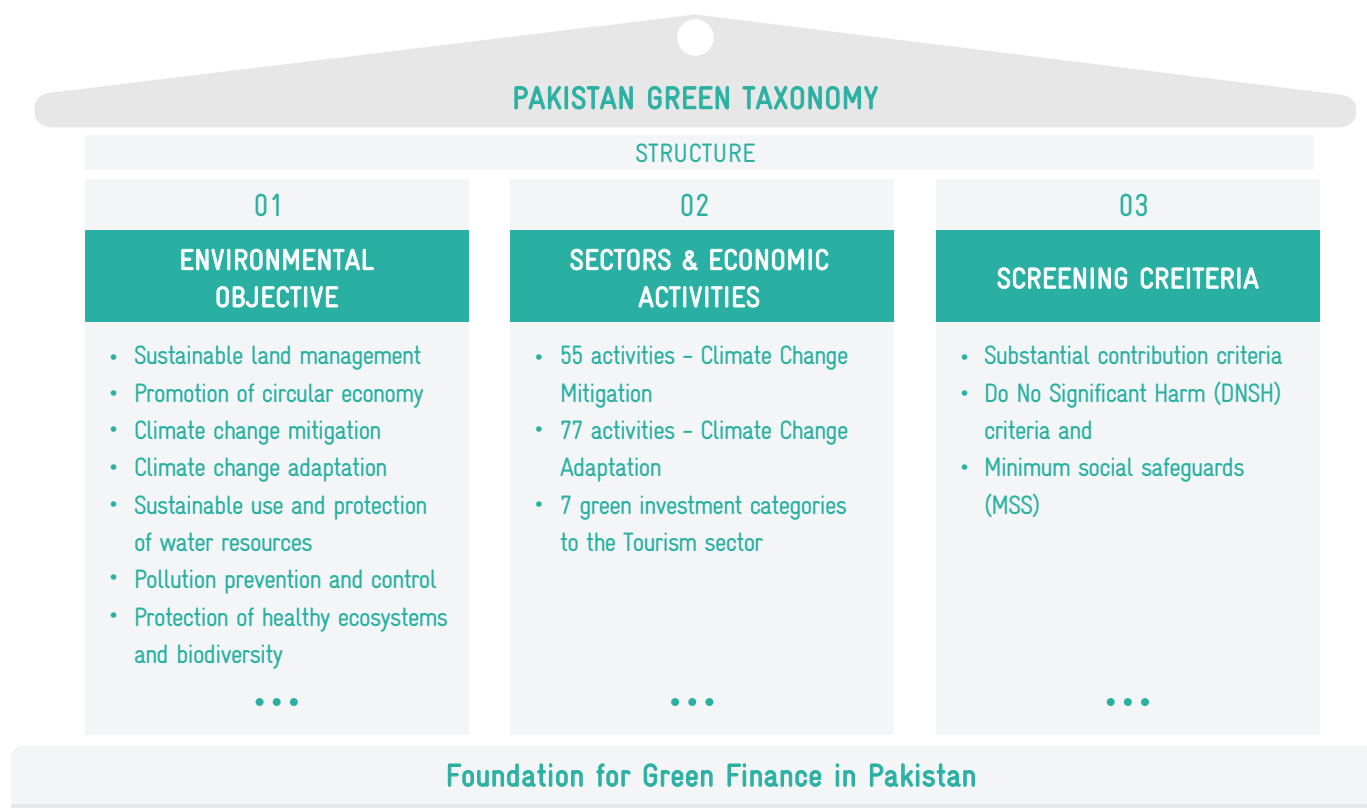


Figure 5.1

5.1 Sectors and Economic Activities

The following sectors were prioritised in the 2025 edition of the PGT and validated by national experts to ensure their relevance to Pakistan. The PGT identifies 55 activities under the Climate Change Mitigation objective, 77 activities and measures under Climate Change Adaptation, and seven green investment categories specific to the Tourism sector.

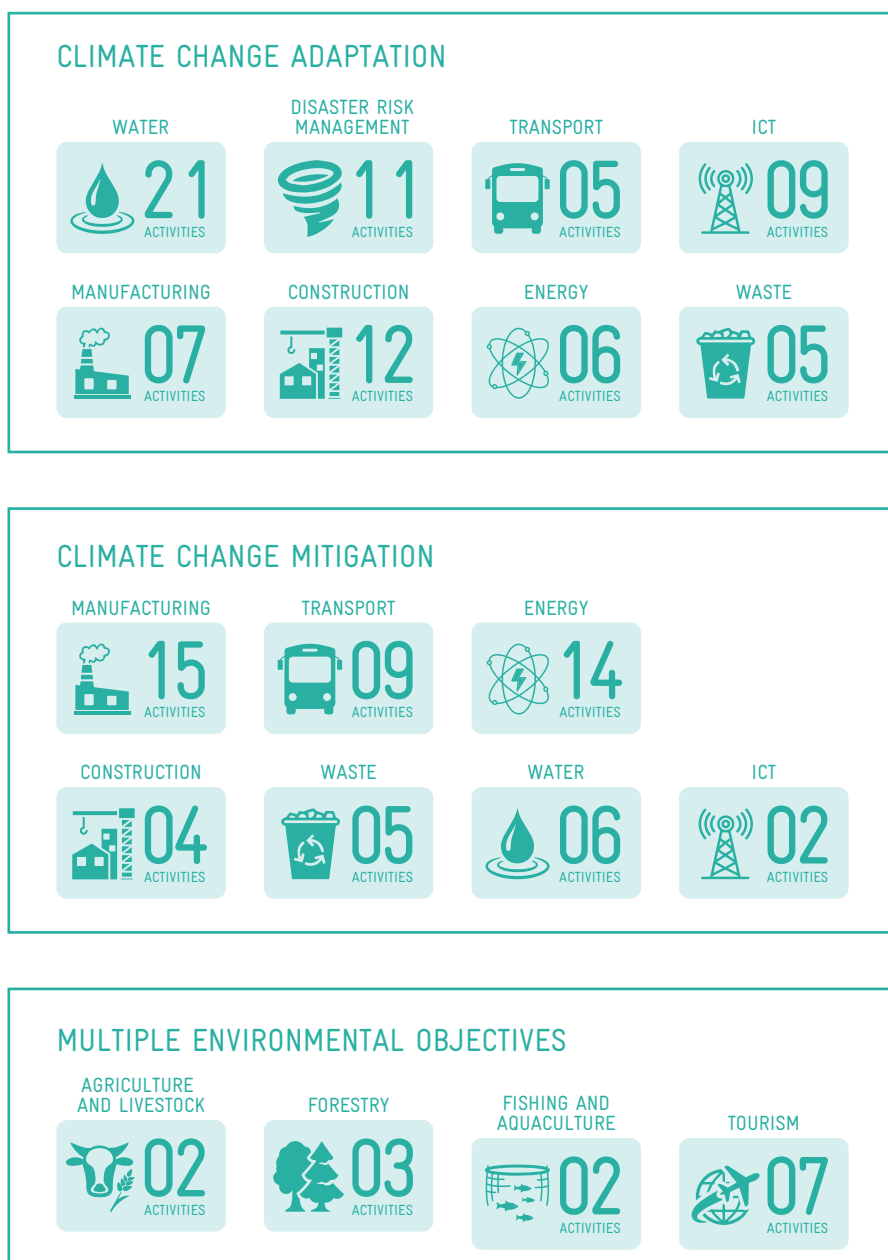


Figure 5.2

5.2 Screening Criteria

An activity or project is eligible when the sector and activity is listed in the Taxonomy. An activity is deemed aligned with the Taxonomy if it fulfills the substantial contribution criteria, adheres to applicable generic and specific DNSH requirements, and complies with the MSS.

Following are the steps that an activity/project must take to demonstrate its alignment with the Taxonomy. Figures 5.3 – 5.7 demonstrate how the PGT can be employed to ascertain whether a project or activity makes a substantial contribution to climate change mitigation; adaptation objectives; to multiple environmental objectives in the land use and tourism sectors.

Figure 5.3 Taxonomy Application for Sectors and Activities that contribute substantially to climate change mitigation objective

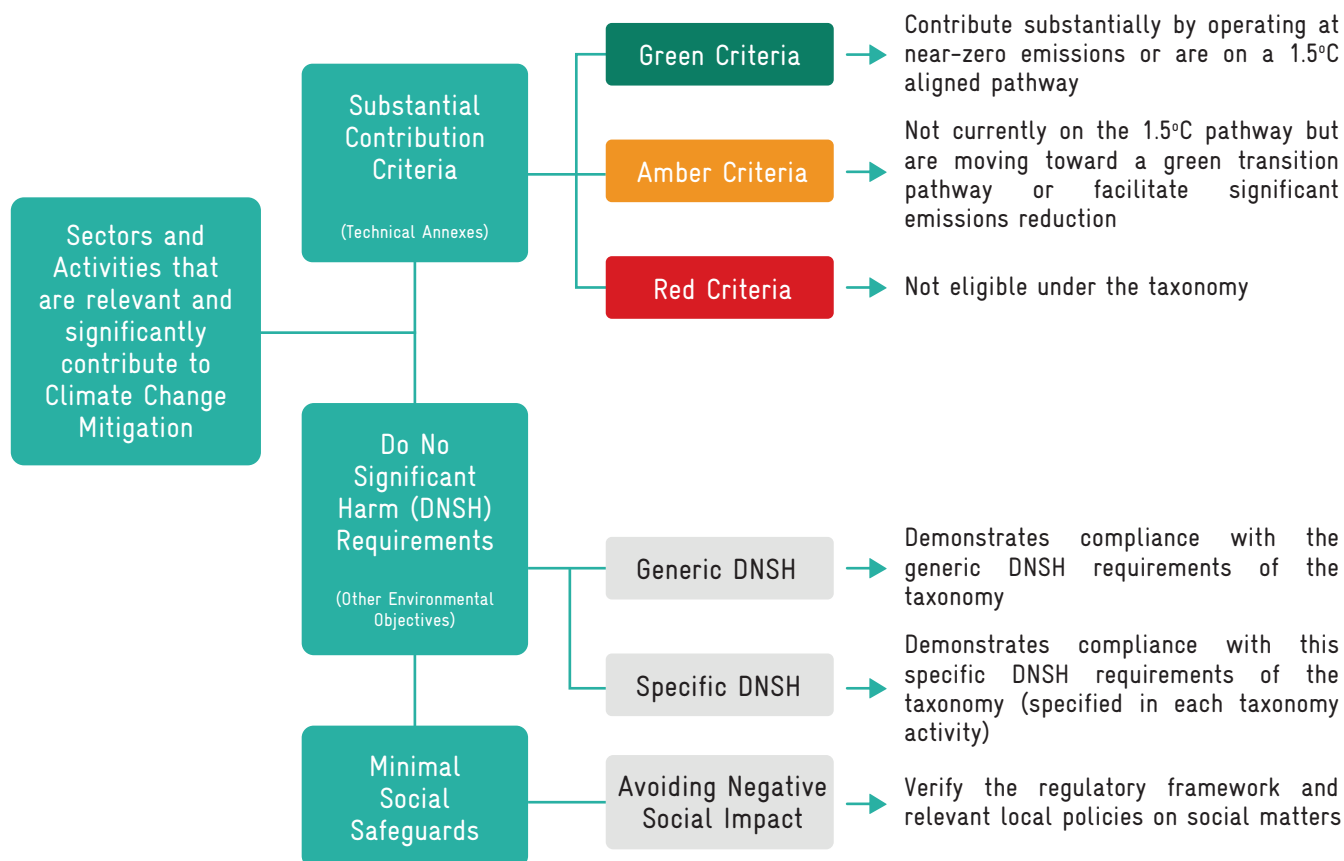


Figure 5.4 Taxonomy Application for Sectors and Activities that contribute substantially to climate change adaptation objective

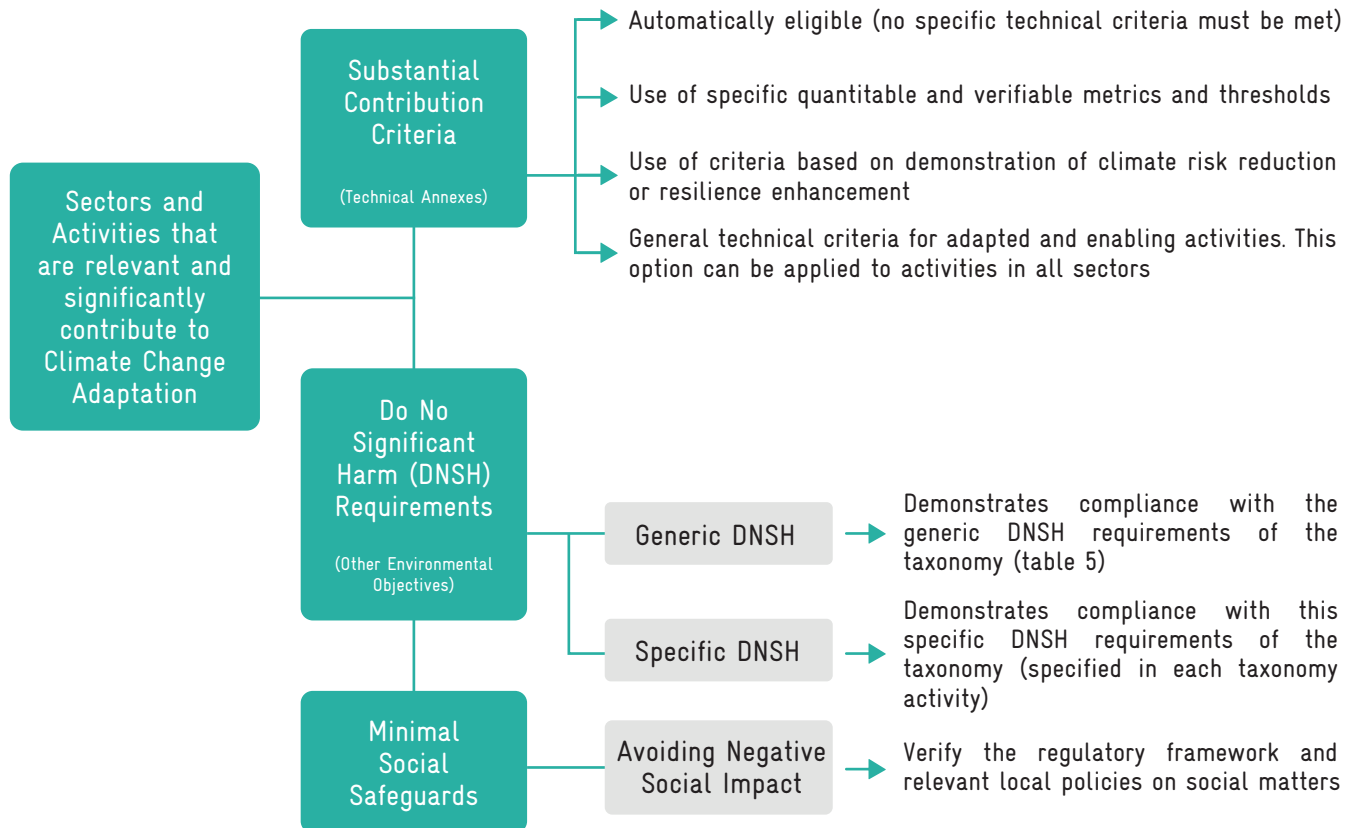


Figure 5.5 Taxonomy Application for Sectors and Activities in the Agricultural (including livestock), Forestry, Fishing and Aquaculture contributing to Multiple Environmental Objectives

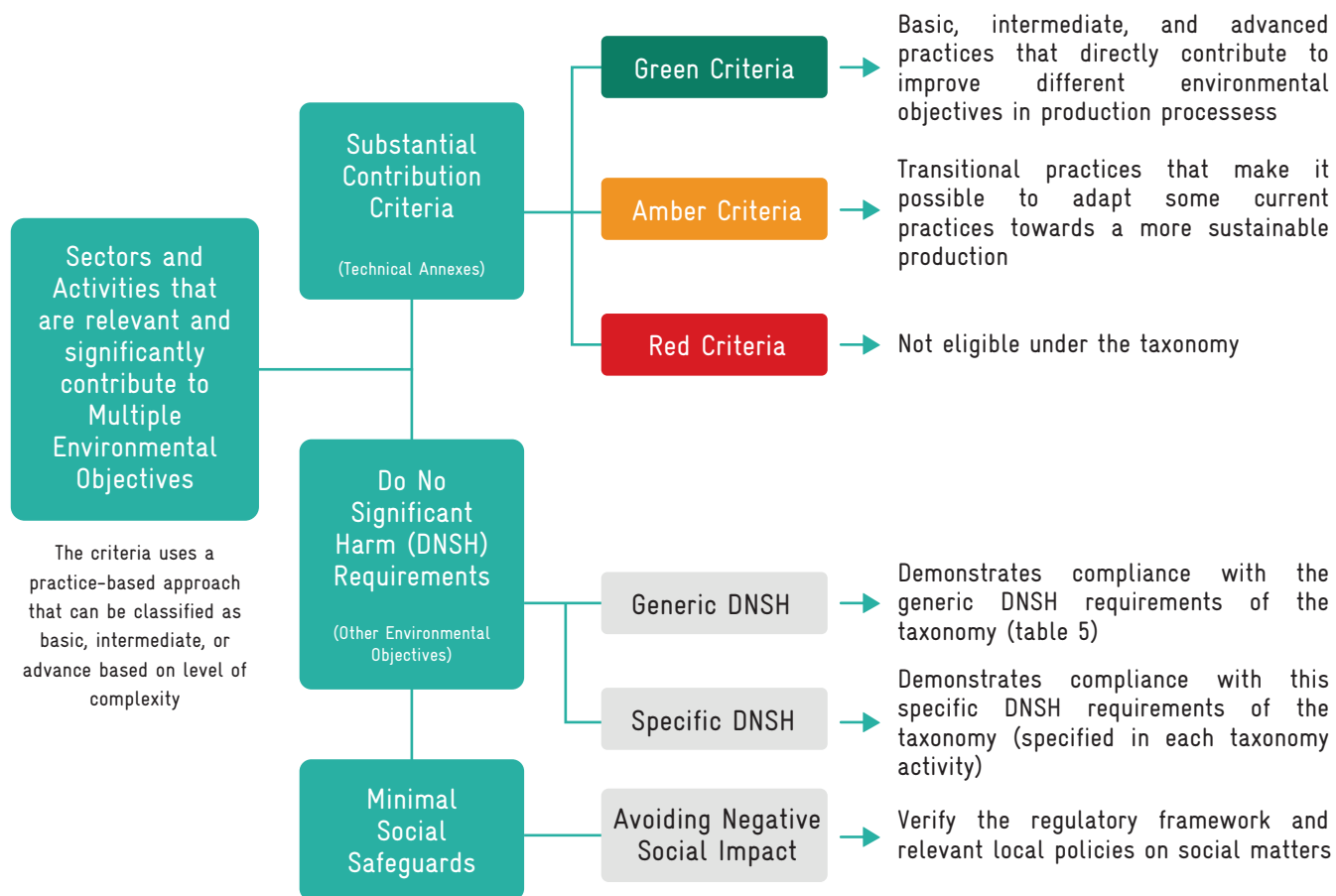
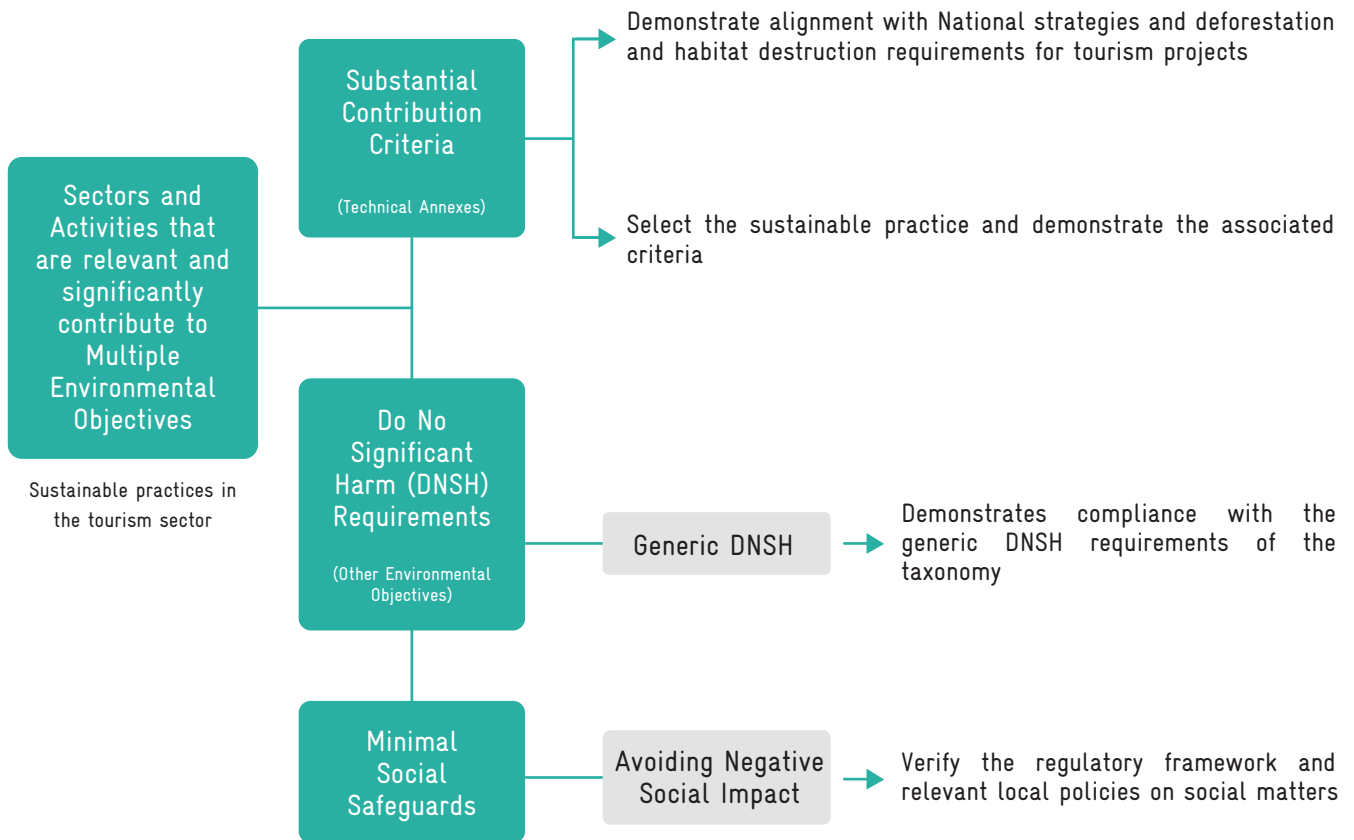


Figure 5.6 Taxonomy Application for Sectors and Activities that contribute substantially to climate change adaptation objective



5.3 Textile Industry under Pakistan Green Taxonomy

Under the Pakistan Green Taxonomy, the Textile industry is assessed against defined criteria to align manufacturing with climate objectives, sustainability standards, and responsible production practices. This is one of the examples from the taxonomy, demonstrating how capital flows can be directed towards activities that promote low-carbon growth, sustainable resource use, and enhanced environmental compliance.

| | |
|-------------------------|--|
| Asset Classes | Manufacturing |
| Activity | Manufacturing of textiles |
| ISIC/PSIC | C1311, C1312, C1313, C1391, C1393, C1399, C1410, C1430, C1520 The activity does not include A0163, C1511, C1512, C4611, C4751, C4771 |
| Description | Manufacture of fabrics and garmets that meet internationally recognised standards on sustainable production and manufacture |
| Environmental Objective | Climate Change Mitigation |
| Methodology | Criteria |

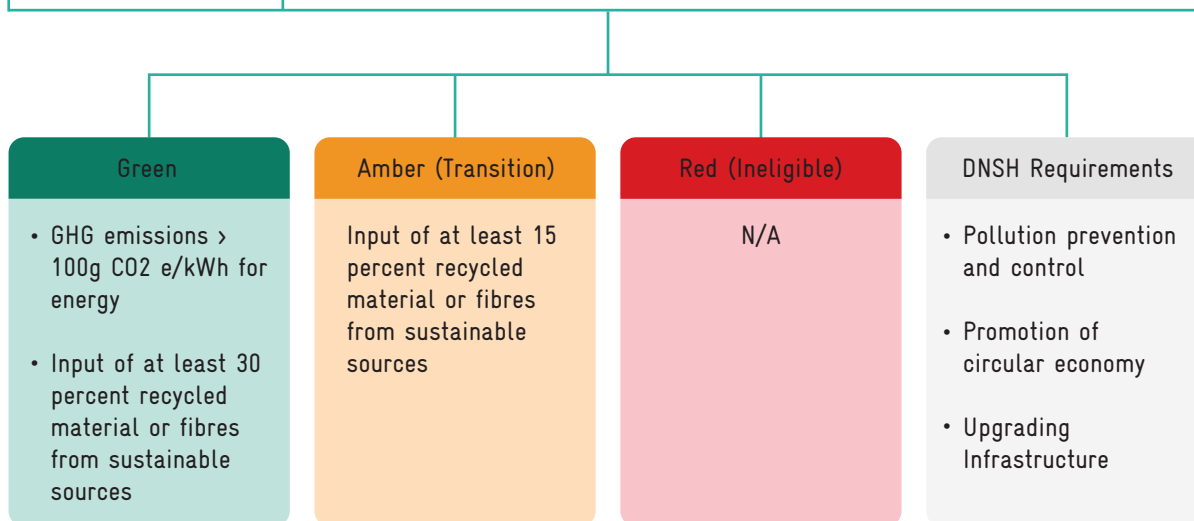


Figure 5.7

6

Reporting & Disclosure

IN THIS SECTION:

- 6.1 Relevant IFRS S2 Disclosure Requirements
- 6.2 Quantitative and Qualitative Measures
- 6.3 Reporting Templates
- 6.4 From Measurement to Action – Using Financed Emissions Data for Shadow Carbon Pricing, Stress Testing & Scenario Analysis
 - 6.4.1 Shadow Carbon Pricing: Monetising Financed Emissions
 - 6.4.2 Scenario Analysis
 - 6.4.3 Stress Testing & Portfolio Steering
- 6.5 Integration Framework: From Measurement to Action

To manage financial and reputational risk and steer in line with the Paris Agreement, it is crucial that the financial sector reports GHG emissions of loans and investments for transparency and accountability. To best support financial institutions in assessing whether their financed emissions are reported in line with PCAF's reporting requirements, the PCAF has developed a Disclosure Checklist. All questions in the checklist are answered with a clear "Yes" or "No." Where a response to a reporting requirement is "No" are complemented with a sufficient justification for the deviation from the standard in the checklist.

The PCAF Standard offers a comprehensive methodology for calculating and reporting financed emissions across asset classes. Its application directly reinforces the disclosure objectives of the IFRS Sustainability Disclosure Standards. IFRS Sustainability Disclosure Standards establish the framework for what must be disclosed to meet global investor expectations on sustainability and climate reporting.

6.1 Relevant IFRS S2 Disclosure Requirements

An entity that participates in commercial banking activities shall disclose:

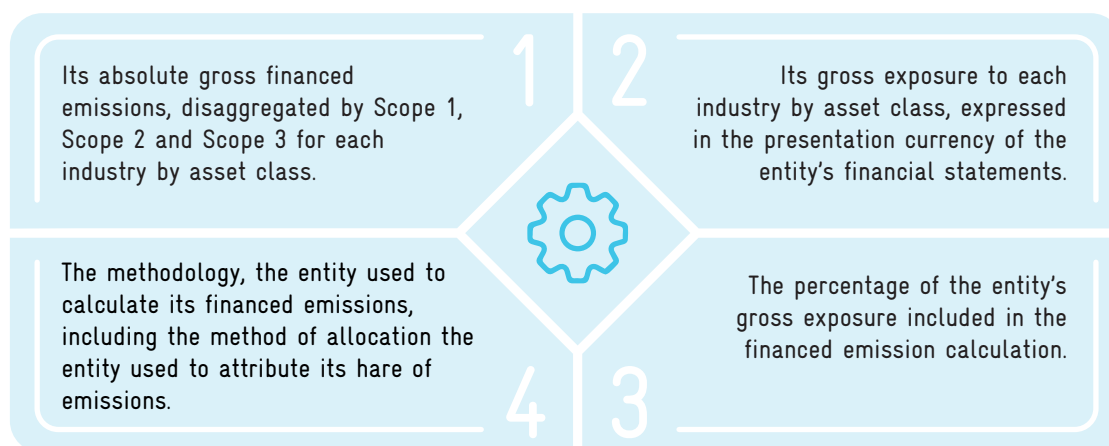


Figure 6.1



Financed emissions reporting is best understood through two dimensions: the quantitative measures, which provide verifiable calculations of portfolio emissions, and the qualitative measures, which embed those results within risk management practices and the Pakistan Green Taxonomy.

6.2 Quantitative & Qualitative Measures

A comprehensive approach to financed emissions requires financial institutions to assess both quantitative and qualitative dimensions. Each serves a distinct purpose but together they provide a complete picture of portfolio alignment and risk management.



QUANTITATIVE MEASURE

- The quantitative measures provide the numerical foundation for financed-emissions disclosure.
- Using the PCAF Standard, banks calculate financed emissions at both absolute and intensity levels.
- This measure allow institutions to identify high-emission concentrations and evaluate exposure to climate-related risks.



QUALITATIVE MEASURE

- The qualitative measures provide the framework within which these numbers gain meaning.
- Through ESRM, banks embed environmental and social considerations into their credit appraisal, due diligence and portfolio monitoring processes.
- The PGT complements this by offering clear classification standards for identifying sustainable activities and guiding capital flows toward priority sectors.

Quantitative and Qualitative measures ensure fact-based, strategic disclosures that enhance climate risk management, guide capital to sustainable sectors, and position banks as enablers of the low-carbon transition.

6.3 Reporting Templates

Financed Emissions Portfolio Reporting Template

With the quantitative and qualitative measures defined, the next step is to present them within a structured reporting format that ensures clarity, consistency, and comparability. The following template offers a structured framework for reporting financed emissions across major asset classes. It consolidates outstanding exposures with Scope 1, 2, and 3 emissions, alongside portfolio emission intensity and data quality indicators. This standardised approach enables institutions to present their financed-emissions footprint in a transparent, consistent, and comparable manner, supporting alignment with international disclosure standards and investor expectations.

| Activity | Outstanding Loan and Investment PKR (Million) | Scope 1 + 2 emissions (tCO ₂ e) | Scope 3 emissions (tCO ₂ e) | Emission Intensity (tCO ₂ e)/Rs | Weighted data quality score |
|---|--|--|--|--|--------------------------------|
| Listed Equity & Corporate Bonds | 31,000 | 195,150 | 84,350 | 9.016 | 1 |
| Business Loans & Unlisted Equity | 2,000 | 1,422 | | 0.711 | 4 |
| Project Finance | 6,500 | 136,668 | | 21.026 | 2 |
| Commercial Real Estate | 2,700 | 7,754 | | 2.87 | 3 |
| Mortgages | 70 | 7.85 | | 0.112 | 2 |
| Motor Vehicle Loans | 35 | 12.355 | | 0.353 | 3 |
| Sovereign Debts | 200 | 925 | | 4.625 | 2 |
| Total | | | | | |
| Emission removal from Forestry and wind project | | 8560 (tCO ₂ e) | | | |

Figure 6.2

This template was introduced in Chapter 4



PGT Alignment and Sustainable Finance Classification Template

Following the assessment of financed emissions, it is equally important to evaluate how portfolio exposures align with sustainable finance frameworks. Financed emissions measure the footprint of lending and investment, green taxonomy provides a forward-looking framework to classify economic activities according to their environmental sustainability.

For demonstration purposes, the template below uses hypothetical portfolio data to illustrate how exposures may be categorized into PGT Eligible and PGT Aligned, followed by their classification into Green/Amber/Red categories.

| Segments | Exposure Pak Rupees | PGT Eligible | PGT Aligned | Classification Green/Amber/Red | Notes |
|------------------------|------------------------|-----------------|----------------|-----------------------------------|-----------------------|
| Cement | 1 billion | 100% | 0% | Red (Not Aligned) | High Risk Exposure |
| ICT | 30 billion | 100% | 75% | Partly Aligned | DNSH Gap |
| Textile | 2 billion | 100% | 50% | Partly Aligned | DNSH Gap |
| Renewable Energy | 5 billion | 100% | 100% | Green (Aligned) | Meet Threshold + DNSH |
| Commercial Real Estate | 2.7 billion | 100% | 20% | Amber (Transition) | Eligible until 2030 |
| Vehicle Financing | 35 million | 0% | 0% | Red (Not Aligned) | High Risk Exposure |

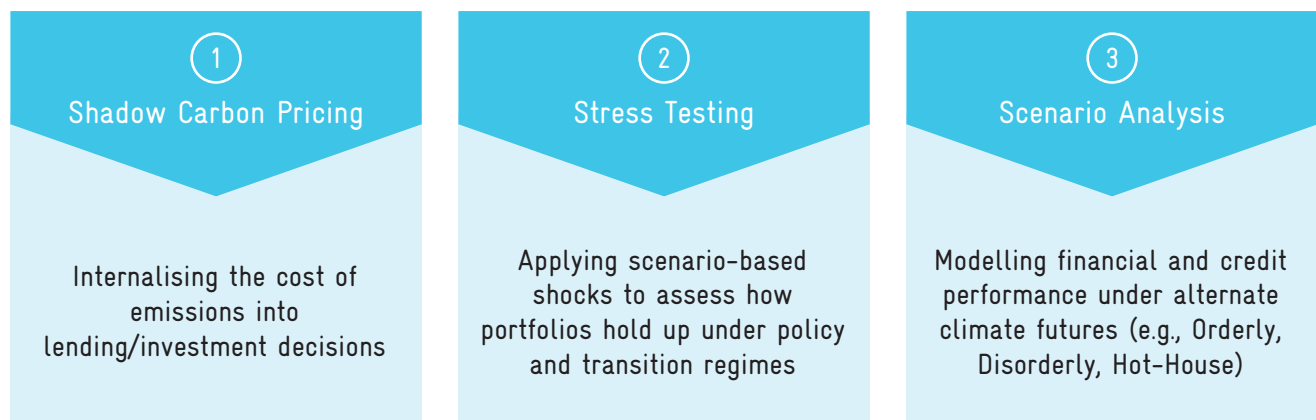
Figure 6.3

A practical example can be seen in the report of BNP Paribas, which demonstrates the application of this framework in practice.

6.4 From Measurement to Action – Using Financed Emissions Data for Shadow Carbon Pricing, Stress Testing & Scenario Analysis

Once a bank has measured and reported its financed emissions, the next challenge is to determine what the data means and how it should guide decision-making. Financed emissions are more than a compliance figure, they represent a financial signal about the carbon exposure embedded within a bank's balance sheet. These emissions indicate the exposure of a bank's lending and investment portfolio to carbon-intensive activities and provide the basis for climate-risk management, transition finance, and disclosure alignment under IFRS S2 (2023) and SBP's ESRM Guidelines (2023). **Once emissions are quantified, the next step is to interpret their financial implications: how do these emissions affect credit quality, capital adequacy, lending decisions, and long-term portfolio value?**

In the “from measurement to action” phase, the bank is required to deploy the data across three strategic tools.



6.4.1 Shadow Carbon Pricing: Monetising Financed Emissions

Shadow carbon pricing converts emissions exposure into a monetary figure. By applying a hypothetical price per tonne of CO₂-equivalent (tCO₂e) to the financed emissions inventory, the bank translates carbon risk into credit-risk and capital-planning terms.

Formula: "Carbon Cost Exposure" = "Financed Emissions (tCO₂e) "×" Shadow Carbon Price (PKR/tCO₂e)"

Illustrated case example of a bank's portfolio

Financed emissions: 60,000 tCO₂e

Total portfolio size: Rs 30,000 million

Shadow carbon price: PKR 20,000/tCO₂e

Carbon cost exposure = 60,000 × 20,000 = PKR 1.2 billion

This figure reflects the potential transition cost borne by borrowers (and ultimately impacting credit quality and capital) if carbon pricing were introduced. It provides banks a tangible lever in pricing, credit-risk assessment and portfolio steering.

6.4.2 Scenario Analysis

Network for Greening the Financial System (NGFS) is a global coalition of central banks and financial supervisors that promotes integrating climate and environmental risks into the financial system. It provides guidance on climate-risk integration, scenario analysis, stress testing, and best practices for sustainable finance. NGFS Phase IV scenarios offer consistent transition and physical-risk pathways for financial institutions and are widely used by regulators for risk management and stress testing.

Banks in Pakistan can adapt NGFS scenarios to local conditions. For example, a transition risk could involve rising shadow carbon prices as countries tighten measures to manage carbon footprints. These scenarios must be calibrated to Pakistan's economic context, sectoral emissions, and climate policy priorities.

Illustrated Example: NGFS Scenarios with hypothetical carbon price trajectory

| NGFS Scenarios | Transition Timing | Hypothetical Carbon Price (PKR/tCO ₂ e) | Key Financial Implication |
|-----------------------|---------------------|--|---|
| Orderly Transition | Early, coordinated | 6,000 → 25,000 | Predictable policy path; moderate credit risk |
| Disorderly Transition | Late, abrupt | 10,000 → 45,000 | Sharp repricing; higher transition risk |
| Hot-House World | Very limited action | < 5,000 | Severe physical risk; systemic financial impact |

By overlaying the financed emissions inventory with scenario-specific carbon prices, banks can estimate Credit at Risk (CaR), quantify capital vulnerability, and guide strategic decisions aligned with SBP's ESRM stress-testing requirements and IFRS S2 disclosure standards.

6.4.3 Stress Testing & Portfolio Steering

Financed emissions data, when combined with shadow-cost assumptions and scenario inputs, permits banks to conduct multi-dimensional stress tests covering both transition and physical-risk channels. Key uses include:

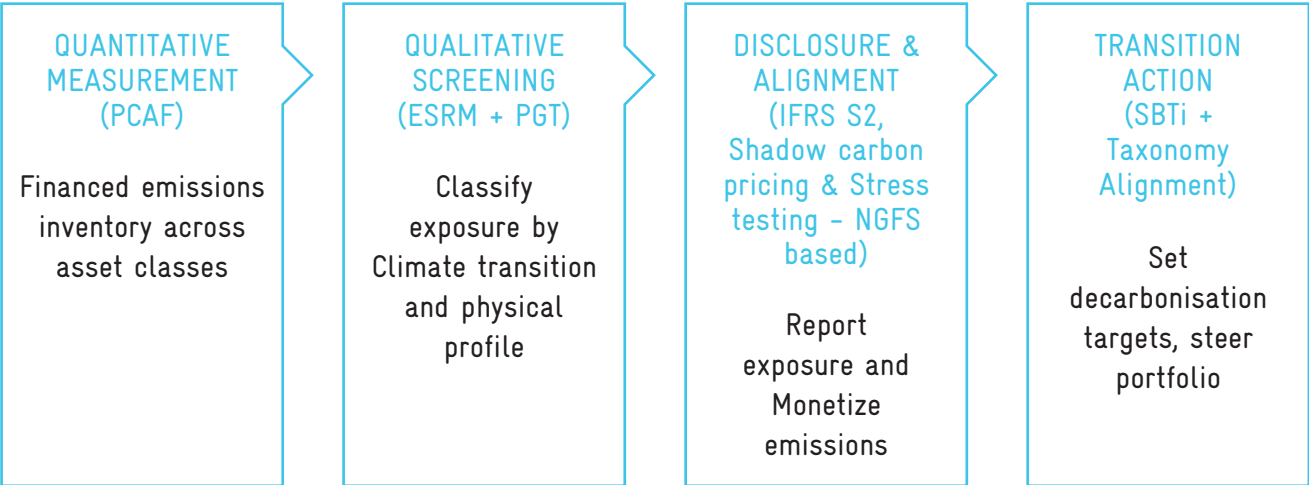
- Sectoral vulnerability analysis: which industries will face high carbon-cost exposures?
- Portfolio rebalancing: shifting toward low-carbon sectors or increasing taxonomy-aligned lending.
- Strategic allocation: embedding carbon cost into internal Risk-Adjusted Return on Capital (RAROC) frameworks and capital-allocation decisions.

For instance, under a Disorderly scenario, the bank might find that its financed-emission exposure in cement and steel translates to potential 10–15% of Tier 1 capital being at risk triggering proactive adjustment of exposure and pricing.

6.5 Integration Framework: From Measurement to Action

Financed Emissions Portfolio Reporting Template

With the quantitative and qualitative measures defined, the next step is to present them within a structured reporting format that ensures clarity, consistency, and comparability. The following template offers a structured framework for reporting financed emissions across major asset classes. It consolidates outstanding exposures with Scope 1, 2, and 3 emissions, alongside portfolio emission intensity and data quality indicators. This standardised approach enables institutions to present their financed-emissions footprint in a transparent, consistent, and comparable manner, supporting alignment with international disclosure standards and investor expectations.



Transition Action will be discussed comprehensively in the following chapter

7

Target Setting & Decarbonisation Pathways

IN THIS SECTION:

- 7.1 Net Zero Transition Plans
- 7.2 Developing a Bank's Transition Plan
- 7.3 Set Targets using the Science Based Targets Initiative (SBTi)
- 7.4 Designing Portfolio Decarbonisation Strategies
- 7.5 Transition Planning Aligned with TPT Framework
- 7.6 Aligning Targets with Pakistan's NDC and Green Taxonomy
- 7.7 Monitoring, Reporting, and Continuous Improvement
- 7.8 From Measurement to Action: How are banks using Financed emissions in their portfolio
- 7.9 Example: Reporting Financed Emissions Across Seven Asset Classes
- 7.10 From Reporting to Responsibility

7.1 Net Zero Transition Plans

Measuring financed emissions allows financial institutions to establish an emissions baseline for scenario analysis and target setting. Without measuring a clear baseline, financial institutions do not have the knowledge necessary to assess scenarios and define their climate targets, let alone gauge their progress in aligning with the Paris Agreement. A robust, transparent and harmonised approach to measuring financed emissions helps financial institutions make informed decisions on target setting, strategy development, and the actions required to decarbonise the economy.

7.2 Developing a Bank's Transition Plan

PCAF outlines the five stages, banking institutions can follow to align with the Paris Agreement. To effectively align with the Paris Agreement and strengthen long-term resilience, financial institutions should adopt a structured transition plan. This approach enables banks to manage portfolio emissions, set credible reduction targets, and embed climate considerations into risk management.

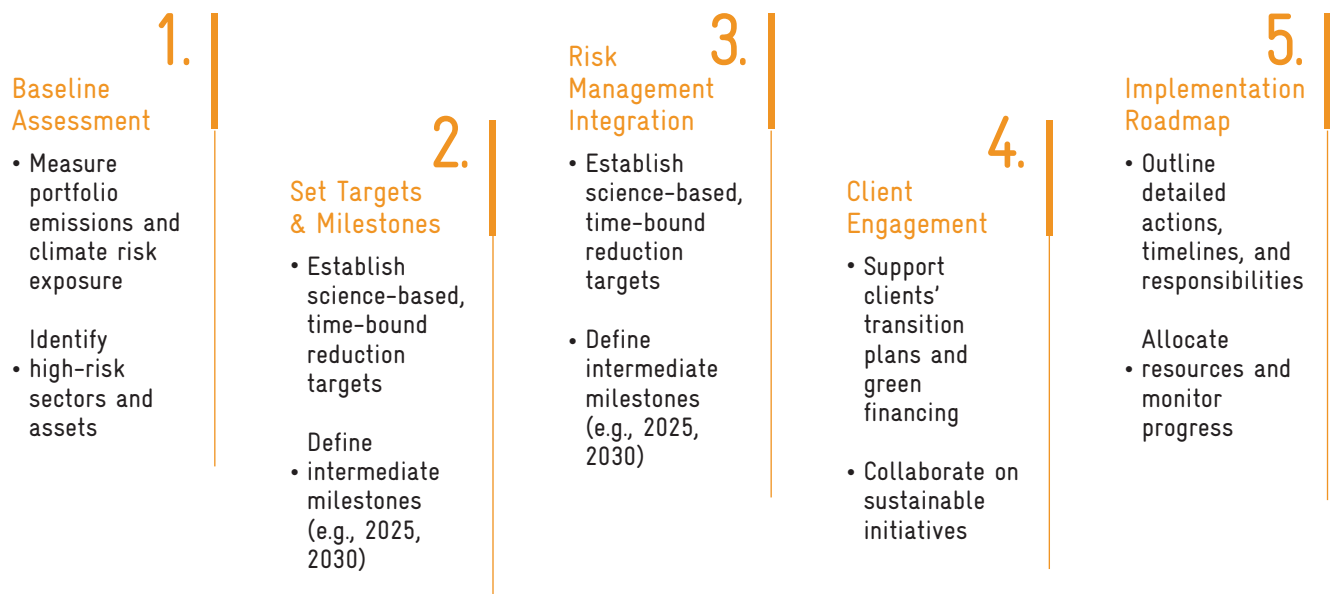


Figure 7.1

7.3 Set Targets using the Science Based Targets Initiative (SBTi)

The SBTi developed the **Financial Institutions Net-Zero Standard** to provide a science-based framework for financial institutions to align their lending, investing activities with net-zero. The Standard is structured in line with the net-zero journey of financial institutions: commitment to net-zero, base year assessment, development of policies and targets, assessment of progress, and communications and claims related to this process. The standard provides the benchmark framework that allows banks to convert financed-emission data into credible decarbonisation commitments consistent with the Paris Agreement and Pakistan's Nationally Determined Contribution. Figure 7.2 illustrates the Standard's conceptual framework, focused on increasing the share of climate-aligned financial activities and reducing portfolio emissions.

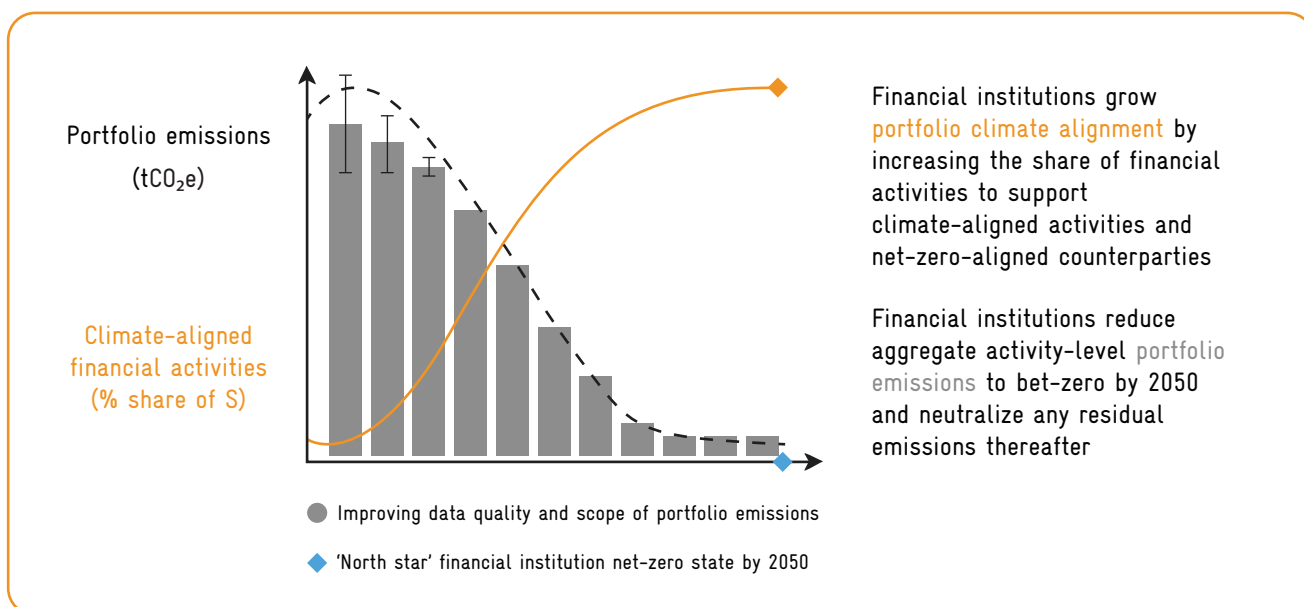


Figure 7.2: SBTi Conceptual Frameworks for Portfolio Decarbonisation and Climate Alignment

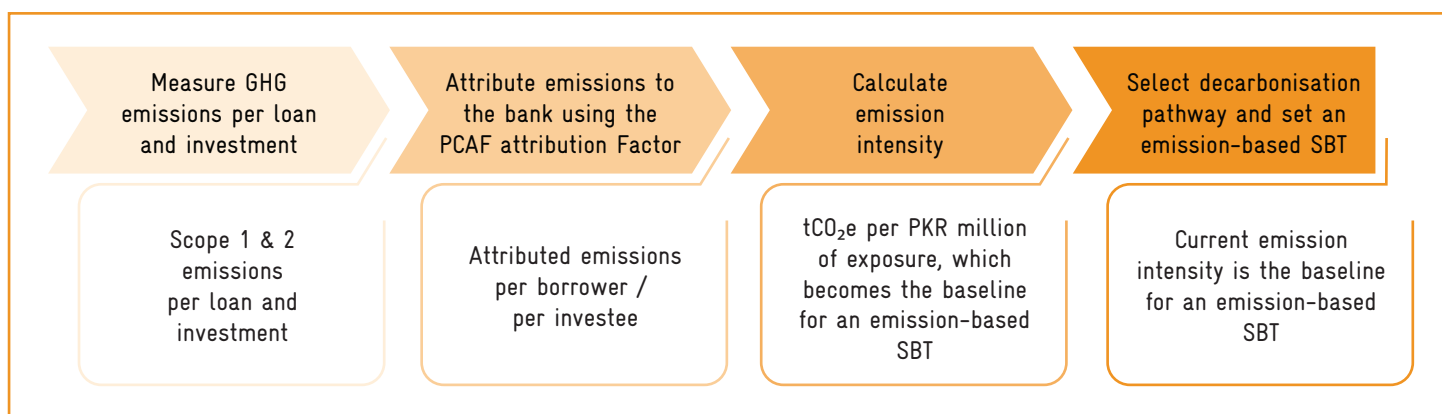


Figure 7.3: Analytical Steps for Setting Science-Based Targets Using the Sectoral Decarbonization Approach (SDA)

The initial step for banks, SBTi, is to make a public, entity-level commitment to achieve net-zero emissions by 2050 or sooner. As per the commitment requirements, the organisational boundary must include all relevant subsidiaries and the governance model. After defining this boundary, as per the Financial Institutions Net-Zero Standard, banks are required to identify in-scope financial activities representing 5% or more of total revenue and classify them into four segments*:

- Corporate Instruments (e.g., loans, debt, equity)
- Project Finance
- Commercial Real Estate
- Mortgages

The segments are used to link sectors with sub-asset classes and business lines to establish a prioritisation in relevant criteria of the Standard.**Furthermore, the SBTi provides detailed guidance on sector-specific metrics, net-zero-aligned benchmarks, and target-setting methods***.

Once the baseline is confirmed, the bank applies sector-specific decarbonisation pathways, known as the Sectoral Decarbonisation Approach (SDA), to determine feasible reduction trajectories.

The Sectoral Decarbonization Approach (SDA) links each sector's carbon-intensity pathway (e.g., tCO₂e per unit of output or credit exposure) to global temperature goals (well below 2°C, aiming for 1.5°C). This process involves three steps:

- Map sector pathways to align with global temperature targets.
- Calculate portfolio intensity based on current exposure.
- Define annual reduction targets needed to reach net-zero by 2050 or earlier, consistent with global benchmarks.

*For details refer to Tables 1.1–1.5,

** Target-setting guidance for these segments is outlined in Table 3: Target specifications (for FINZ-C13 Portfolio near-term and FINZ-C14 Portfolio long-term targets.

*** Refer Table 4.3: Sector specifications – metrics, net-zero-aligned benchmarks, and target-setting methods.

7.4 Designing Portfolio Decarbonization Strategies

SBTi requires financial institutions to pursue measurable emission reductions rather than only divestment. In practice, this means using three integrated levers for portfolio decarbonisation:

| Decarbonisation Lever | Approach | Example Application for Banks |
|-----------------------|---|---|
| Engagement | Work with high-emitting clients to set their own SBTs and report verified emissions data (DQS 1-2). | Engage large power producers or cement firms to adopt energy-efficiency or renewable targets. |
| Steering | Redirect new financing toward low-carbon and PGT-aligned sectors, gradually reducing exposure to carbon-intensive assets. | Adjust sectoral limits to favor renewable energy, EV, and green buildings. |
| Exit / Phase-down | Phase out relationships or exposures that cannot align with the bank's decarbonisation trajectory. | Time-bound exit from coal-based lending by 2030 in line with SBP's ESRM guidance. |

This tri-channel approach ensures that decarbonisation is managed, not merely offloaded. By balancing engagement, steering, and exit, banks can preserve client relationships while re-positioning their portfolios toward a climate-resilient economy.

7.5 Transition Planning Aligned with TPT Framework

The Transition Plan Taskforce (TPT, 2023) recommends that banks adopt a strategic and rounded approach to transition planning across three inter-connected channels:

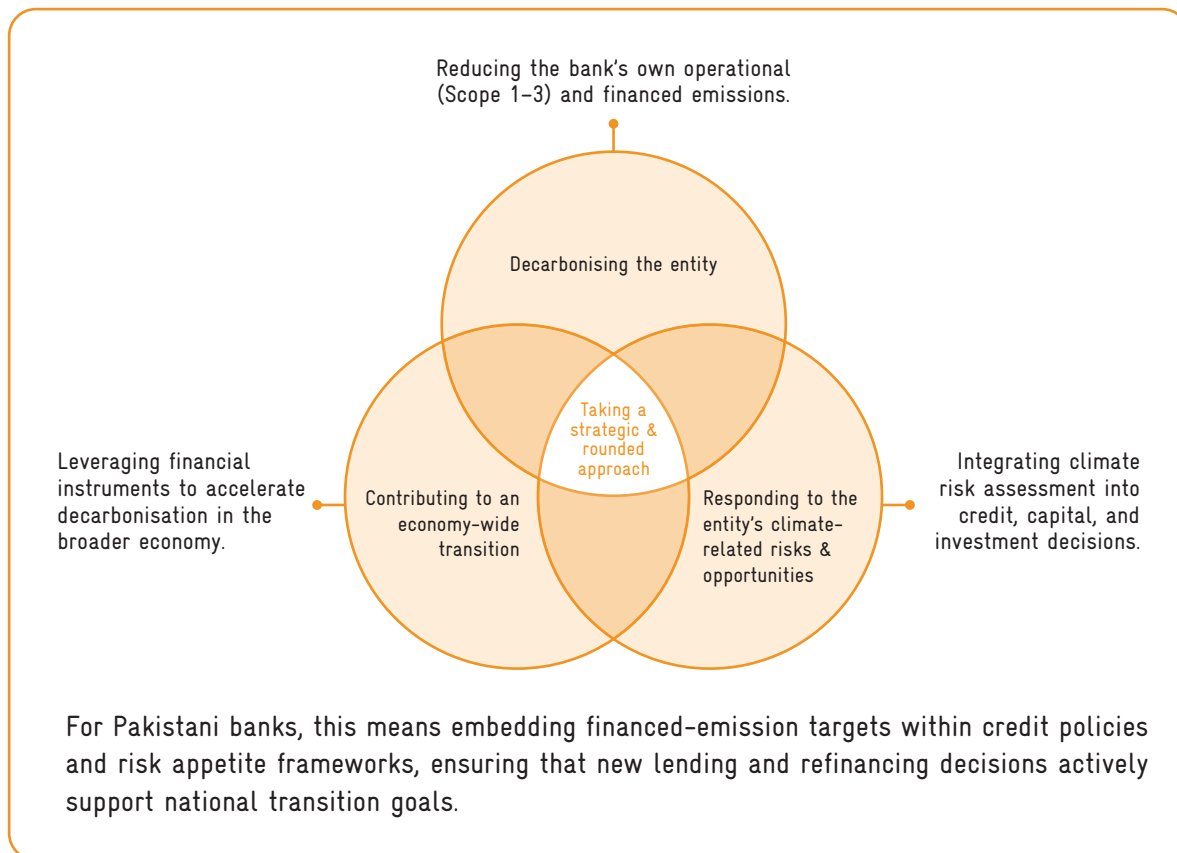


Figure 7.4: Transition Plan Taskforce (TPT) Framework – A Strategic and Rounded Approach to Decarbonisation

Financed-emission data helps link carbon intensity to credit worthiness. By treating a borrower's shadow carbon cost as an additional expense in cash-flow projections, banks can adjust credit ratings and pricing. This approach makes climate risk financially visible and ensures the true cost of carbon is reflected in lending decisions. To operationalise this, banks can incorporate financed-emission metrics and internal carbon prices into:

- Credit Appraisal Forms (CAF) to assess borrowers' transition readiness.
- Risk-Adjusted Return on Capital (RAROC) to factor carbon cost exposure.
- Sectoral Lending Caps by setting emission-intensity thresholds by sector.

This integrated approach will support compliance with both IFRS S2 and SBP ESRM disclosure expectations.

7.6 Aligning Targets with Pakistan's NDC and Green Taxonomy

Pakistan's Updated NDC (2025) commits to reducing GHG emissions by 50% below the Business-as-Usual pathway by 2030, conditional on international finance. The Pakistan Green Taxonomy (2025) further defines economic activities that qualify as environmentally sustainable. Banks can therefore align their financed-emission targets with the NDC by prioritising financing that contributes to these national objectives, for example:

- Renewable power and hybrid energy systems
- Energy-efficient housing and commercial real estate
- Sustainable transport and electric mobility
- Climate-resilient agriculture and water infrastructure

By increasing the share of PGT-aligned activities in their portfolio, banks demonstrate measurable progress toward national and international decarbonisation commitments.

7.7 Monitoring, Reporting, and Continuous Improvement

Once science-based targets are set, the bank must monitor portfolio emission intensity annually and disclose progress transparently under IFRS S2. SBTi requires reporting of both absolute financed emissions and emission intensity per unit of exposure. Over time, improving data quality (DQS) and enhancing borrower engagement will reduce uncertainty and allow targets to be recalibrated with greater precision. For Pakistani banks, aligning with SBTi and the national NDC framework represents both a regulatory necessity and a competitive advantage in accessing green and blended-finance opportunities from international partners.

Therefore, accounting for financed emissions is an important part of the process that banks take when aligning their lending and investment portfolios with the goals of the Paris Agreement and contribute to Pakistan's low-carbon transition. This process has five non-linear stages.



Figure 7.5: The Financed Emissions Monitoring and Continuous Improvement Cycle – Integrating IFRS S2 Reporting with Decarbonisation Strategy

7.8 From Measurement to Action: How are banks using Financed emissions in their portfolio

Example: Applying Financed Emissions in Cement – A High-Priority Sector

Cement is a major carbon-emitting industry, especially important for Pakistan's infrastructure. Banks can support its decarbonisation by setting intensity-based sectoral targets that align financed emissions with climate goals. HSBC's approach connects these targets to client engagement and investment strategies. Where specific 2030 targets are lacking, HSBC uses transitional methods that balance emissions impact, feasibility, and just transition, while promoting sustainable financing and transparent reporting.

| CEMENT | |
|---|---|
| Metric | tCO ₂ e per tonne of cement |
| Scope | Scope 1 and 2 |
| Value Chain Focus | Midstream e.g., clinker and cement manufacturing |
| Target | Intensity, 0.46 tCO ₂ e/t cement by 2030 from 2019 |
| Scenario | IEA NZE 2021 |
| Value Chain and Scope <p>For the cement sector, we included scopes 1 and 2 of the midstream (e.g., clinker and cement manufacturing) companies in the value chain. We believe the majority of emissions come from cement manufacturing, particularly the emissions associated with the sintering process. The upstream emissions of this sector will be covered when we expand our coverage to other sectors.</p> <p>For the cement sector we set an emissions intensity metric. An emissions intensity metric for the cement sector allows us to work with clients and account for the anticipated increase in capital investments required for rapid decarbonisation.</p> | |
| Reference Scenario <p>In line with the IEA NZE 2021 scenario, we target an on-balance sheet financed emissions intensity of 0.46 tonnes of carbon dioxide per tonne of cement ('tCO₂e/t cement'). using 2019 as our baseline.</p> | |

Figure 7.6: HSBC's sector-specific decarbonisation plans highlighting practical pathways for the Cement industry

For further details, see the [Financed Emissions and Thermal Coal Exposures Methodology February 2024](#)

7.9 Example: Reporting Financed Emissions Across Seven Asset Classes

In this example, the bank publicly discloses financed emissions for seven asset groups representing its full on-balance sheet portfolio. This comprehensive approach connects emissions measurement with strategic target setting, providing investors, regulators, and internal stakeholders with clear, comparable metrics to assess decarbonisation progress. This showcases how a financial institution can report and manage financed emissions across multiple asset classes in alignment with PCAF, IFRS S2, and SBTi.

Woori Financial Group, headquartered in Seoul, South Korea, is a financial holding company with core businesses in banking, credit cards, asset management, and insurance. Listed on the NYSE and Korea Exchange, it operates globally through subsidiaries such as Woori Bank. The group is a member of the PCAF and publishes financed emissions disclosures, aligning its commitments with net-zero targets and international sustainability standards.

The institution reports:

1. Financed emissions (in tCO₂e)
2. Portfolio exposure (in reporting currency)
3. Financial intensity (10,000 tCO₂e)
4. Decarbonization targets aligned with SBTi pathways

| SEVEN ASSET GROUPS | ASSETS (KRW billion) | FINANCED EMISSIONS (10,000 tCO ₂ e) | FINANCIAL INTENSITY |
|---|-------------------------|--|------------------------|
| Listed equity & corporate bonds | 31,226 | 167 | 5.3 |
| Business loans & unlisted equity | 86,716 | 4,011 | 46.2 |
| Project finance | 5,820 | 345 | 59.2 |
| Commercial real estate | 38,301 | 45 | 1.2 |
| Mortgages (for purchase) | 40,854 | 18 | 0.4 |
| Motor vehicle loans | 4,340 | 41 | 9.4 |
| Total (before including Sovereign debt) | 207,256 | 4,626 | 22.3 |
| Sovereign debt** | 19,137 | 640 | 33.5 |
| Total (after including Sovereign debt) | 226,393 | 5,267 | 23.3 |

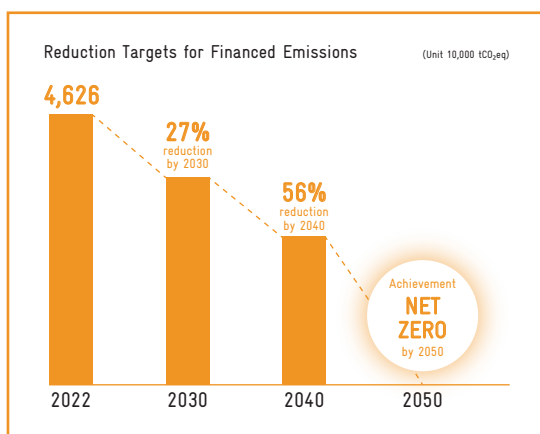


Figure 7.7 and 7.8 Bank-Wide Financed Emissions Disclosure – Reporting Seven Asset Classes under IFRS S2 and SBTi Alignment; Financed Emissions Reduction Trajectory Toward Net-Zero by 2050
Excerpts from Woori Financial Group Sustainability Report 2022*

Woori Financial Group Sustainability Report 2022 can be accessed here:

https://carbonaccountingfinancials.com/files/institutions_downloads/2022-Woori-Financial-Group-EN.pdf

7.10 From Reporting to Responsibility

Financed emissions are at the core of climate-related financial disclosures. For most banks, these emissions far outweigh their operational footprint, making them the single most material indicator of climate impact. By applying the PCAF methodology, institutions can measure and disclose financed emissions with consistency and transparency—yet disclosure is only the first step.

In today's regulatory and market landscape, stakeholders—ranging from SBP and SECP to global investors, clients, and civil society—demand more than passive reporting. They expect banks to actively manage their portfolios toward decarbonisation, aligning capital flows with Pakistan's NDC targets, the Pakistan Green Taxonomy (PGT), and global net-zero commitments.

Transitioning from reporting to responsibility means using financed emissions data not only to comply with standards, but also to drive meaningful change in the real economy. For banks in Pakistan, this creates both a responsibility and an opportunity: to de-risk portfolios, build resilience, and finance the country's low-carbon transition.

Four Practical Steps for Banks:



Take inventory of your financed emissions to identify the biggest emissions reductions opportunities in your portfolio



Encourage companies in your portfolio to measure their carbon emissions for more detailed visibility



Encourage portfolio companies to set and track science-aligned decarbonisation targets



Report on progress and support portfolio companies with resources and advice to integrate climate considerations into their business strategy

Glossary of Financed Emissions Terms with Examples

| | |
|---|---|
| Asset Class | A category of financial instruments used to classify exposures for financed emissions. <u>Example:</u> Business loans, listed equity, project finance, and sovereign debt are all asset classes under PCAF. |
| Attribution Factor | The share of a borrower's or project's emissions attributed to a financial institution. <u>Example:</u> If a bank lends PKR 2 billion to a company with a total capital of PKR 10 billion, the attribution factor is 0.2 (20%). |
| Business Loans & Unlisted Equity | Loans and equity investments in private companies not traded on public markets. <u>Example:</u> Green Trust Bank's loan to Indus Textile Pvt. Ltd. is classified under this asset class. |
| Carbon Intensity | Emissions per unit of economic activity (e.g., tCO ₂ e per PKR million invested). <u>Example:</u> A bank portfolio with 60,000 tCO ₂ e emissions and PKR 30,000 million exposure has an intensity of 2 tCO ₂ e per PKR million. |
| Climate Risk | Financial risks arising from climate change, including physical and transition risks. <u>Example:</u> A cement company may face transition risk due to carbon pricing policies affecting its profitability. |
| Commercial Real Estate (CRE) | Loans or investments in commercial property. <u>Example:</u> Green Trust Bank's exposure to Habib Property Developers for five buildings in Karachi CBD. |
| Control Approach | Emissions are reported based on operational or financial control over an entity. <u>Example:</u> A bank with majority ownership in a subsidiary reports 100% of its emissions under the control approach. |
| Data Quality Score (DQS) | A rating (1–5) indicating the reliability of emissions data. <u>Example:</u> Verified emissions from PakPro Ltd. received a DQS of 1; estimated emissions from Indus Textile received a DQS of 4. |
| Decarbonisation | Reducing carbon emissions through strategic financial decisions. <u>Example:</u> Steering capital toward renewable energy projects and away from fossil fuels. |
| Disclosure Checklist | A PCAF tool to assess compliance with financed emissions reporting standards. <u>Example:</u> Banks use the checklist to verify if Scope 1–3 emissions are disclosed per asset class. |
| Economic Emissions Intensity (EEI) | Financed emissions divided by the outstanding amount of loans/investments. <u>Example:</u> 65,000 tCO ₂ e financed emissions over PKR 1 billion investment results in 65 tCO ₂ e per PKR million. |
| Enterprise Value Including Cash (EVIC) | Used to calculate attribution factors for listed companies. <u>Example:</u> PakPro Ltd. has an EVIC of PKR 10 billion, used to determine Green Trust Bank's share of emissions. |
| Environmental and Social Risk Management (ESRM) | A framework for integrating environmental and social risks into financial decisions. <u>Example:</u> ESRM requires due diligence on high-emitting clients and may trigger enhanced monitoring. |
| Emission Factor | A coefficient used to estimate emissions based on activity data. <u>Example:</u> DEFRA's emission factor of 2.35372 kg CO ₂ e/litre is used for vehicle emissions. |
| Financed Emissions | GHG emissions associated with lending, investment, and financial services. <u>Example:</u> Green Trust Bank's exposure to Sindh Gas Power Ltd. resulted in 136,668 tCO ₂ e financed emissions. |
| Financial Control | A boundary-setting approach where emissions are reported for entities under financial control. <u>Example:</u> A bank with control over a subsidiary includes its emissions in Scope 1 and 2. |
| Financing Instruments | Tools like green bonds and sustainability-linked loans used to support climate-aligned finance. <u>Example:</u> Issuing a green sukuk to fund solar energy projects. |
| GHG Protocol (GHGP) | A global standard for greenhouse gas accounting. <u>Example:</u> GHGP Scope 3, Category 15 covers financed emissions from investments. |

| | |
|--|--|
| Green Taxonomy (Pakistan) | A classification system defining green, transition, and non-aligned economic activities. <u>Example:</u> Textile manufacturing using 30% recycled material is classified as "green" under PGT. |
| Green Sukuk | Sharia-compliant bonds used to finance environmentally sustainable projects. <u>Example:</u> A bank issues a green sukuk to fund a wind energy farm. |
| IFRS S2 | Climate-related disclosure standard requiring reporting of financed emissions. <u>Example:</u> Banks must disclose Scope 1–3 emissions and methodology used under IFRS S2. |
| Intensity-Based Target | A decarbonisation goal expressed as emissions per unit of financial exposure. <u>Example:</u> Reducing emissions intensity from 2.0 to 1.5 tCO ₂ e per PKR million by 2030. |
| Known Use of Proceeds | Financing tied to a specific project or activity. <u>Example:</u> A loan for a gas-fired power plant qualifies as known use of proceeds. |
| Listed Equity & Corporate Bonds | Publicly traded shares and bonds. <u>Example:</u> Green Trust Bank's investment in PakPro Ltd. is classified under listed equity. |
| Mortgages | Loans for residential property purchases. <u>Example:</u> A loan to Mr. Ahsan Ali for four urban homes with 25,000 kWh annual electricity use. |
| Motor Vehicle Loans | Financing for vehicles, with emissions calculated based on fuel efficiency and usage. <u>Example:</u> Financing five petrol vehicles with 75,000 km annual travel results in 12.355 tCO ₂ e. |
| Nationally Determined Contributions (NDCs) | Pakistan's climate commitments under the Paris Agreement. <u>Example:</u> Pakistan aims to reduce emissions by 50% by 2030 (15% unconditional, 35% conditional). |
| Net-Zero Target | A commitment to reduce emissions to zero or offset remaining emissions by 2050. <u>Example:</u> A bank sets a net-zero target for its portfolio using SBTi guidelines. |
| Operational Emissions | Emissions from a financial institution's own operations. <u>Example:</u> Scope 1 emissions from company-owned vehicles and Scope 2 from purchased electricity. |
| PCAF (Partnership for Carbon Accounting Financials) | A global standard for measuring and reporting financed emissions. <u>Example:</u> Green Trust Bank uses PCAF to calculate emissions across seven asset classes. |
| Project Finance | Loans or equity tied to specific projects. <u>Example:</u> Financing Sindh Gas Power Ltd.'s plant with emissions directly attributed to the project. |
| Proxy Data | Estimated data used when actual emissions or financial data are unavailable. <u>Example:</u> Using sectoral averages for Indus Textile Pvt. Ltd. due to lack of disclosures. |
| RAROC (Risk-Adjusted Return on Capital) | A financial metric incorporating carbon cost into credit risk assessment. <u>Example:</u> A bank adjusts RAROC for a cement company based on its shadow carbon cost. |
| Scope 1 Emissions | Direct emissions from owned or controlled sources. <u>Example:</u> Emissions from a cement plant's fuel combustion. |
| Scope 2 Emissions | Indirect emissions from purchased energy. <u>Example:</u> Electricity used by a textile factory. |
| Scope 3 Emissions | All other indirect emissions, including financed emissions. <u>Example:</u> Emissions from a bank's investment in a logistics company. |
| Science Based Targets initiative (SBTi) | A framework for setting emissions reduction targets aligned with climate science. <u>Example:</u> A bank commits to reduce financed emissions by 27% by 2030 using SBTi. |

| | |
|-----------------------|--|
| Shadow Carbon Pricing | Applying a hypothetical price to emissions to assess financial risk. <u>Example:</u> Applying PKR 20,000/tCO ₂ e to 60,000 tCO ₂ e results in PKR 1.2 billion carbon cost exposure. |
| Sovereign Debt | Government-issued securities, with emissions attributed using national GHG inventories. <u>Example:</u> Green Trust Bank's investment in T-bills is linked to Pakistan's national emissions. |
| Stress Testing | Assessing portfolio resilience under climate scenarios and policy shocks. <u>Example:</u> Evaluating how cement sector exposure responds to a PKR 45,000/tCO ₂ e carbon price. |

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