

# The GLOBAL GHG ACCOUNTING & REPORTING Standard

FOR THE FINANCIAL INDUSTRY



**PCAF**

Partnership for  
Carbon Accounting  
Financials





This standard has been reviewed by the GHG Protocol and is in conformance with the requirements set forth in the Corporate Value Chain (Scope 3) Accounting and Reporting Standard, for Category 15 investment activities.

# The GLOBAL GHG ACCOUNTING & REPORTING Standard

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FOR THE FINANCIAL INDUSTRY

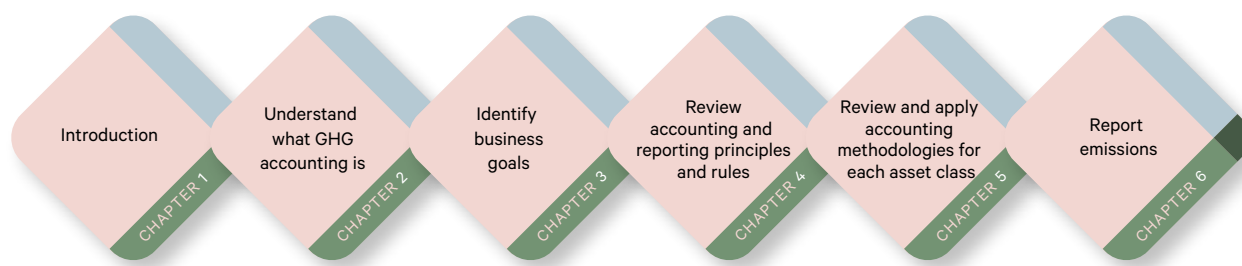


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Carbon Accounting  
Financials

Please cite this document as:

**PCAF (2020). The Global GHG Accounting and Reporting Standard for the Financial Industry. First edition.**

November 18, 2020



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# Acknowledgements

In September 2019, the Partnership for Carbon Accounting Financials (PCAF) was launched globally to harmonize greenhouse gas (GHG) accounting methods and enable financial institutions to consistently measure and disclose the GHG emissions financed by their loans and investments. These emissions are also called financed emissions or portfolio climate impact.

As an industry-led partnership, PCAF is governed by a Steering Committee of ABN AMRO, Amalgamated Bank, ASN Bank, the Global Alliance for Banking on Values, Morgan Stanley, NMB Bank, Triodos Bank, and a representative from the United Nations (UN)-convened Net-Zero Asset Owner Alliance. At the time of publishing this document, more than 85 banks and investors participate in PCAF.<sup>1</sup> Out of this group, 16 volunteered to form the PCAF Core Team to co-create the Global GHG Accounting and Reporting Standard for the Financial Industry with the ultimate goal of harmonizing greenhouse gas accounting. The PCAF Global Core Team is depicted below:



The PCAF Secretariat facilitated the Core Team's work by moderating their technical discussions, reviewing the content, and compiling and editing this document. The PCAF Secretariat is operated by Guidehouse, a global consultancy firm specialized in energy, sustainability, risk, and compliance for the financial industry.

Observers to the process of developing the Global GHG Accounting and Reporting Standard for the Financial Industry include Barclays, the Green Climate Fund, the General Council for Islamic Banks and Financial Institutions, and other organizations. As observers, these financial entities were proactively informed and involved in the development process of the Global GHG

<sup>1</sup> The full list of PCAF participants can be found at:  
<https://carbonaccountingfinancials.com/financial-institutions-taking-action#overview-of-institutions>

Accounting and Reporting Standard and had the opportunity to provide input and feedback. Observers' participation does not imply official endorsement nor commitment to PCAF.

Throughout the development of the Global GHG Accounting and Reporting Standard (October 2019-November 2020), PCAF engaged with civil society organizations to consider their ideas, discuss PCAF methodological approaches, and receive feedback. During August and September 2020, PCAF also held a public consultation with financial institutions, policy makers, data providers, consultants, and nongovernmental organizations (NGOs).

This standard has been reviewed by the GHG Protocol and conforms with the requirements set forth in the Corporate Value Chain (Scope 3) Accounting and Reporting Standard for Category 15 investment activities.

# Foreword by the PCAF Steering Committee

As the urgency of the climate emergency grows with still-rising global greenhouse gases and proliferating physical impacts, increasing efforts are now being directed at how to prepare the global financial system to manage carbon risks and bring solutions to the climate challenge, by bringing emissions down to net-zero.

It is against that back drop that, as members of the Steering Committee for the Partnership for Carbon Accounting Financials (PCAF), we have been building what we believe to be an essential and crucial component of the broader climate finance ecosystem. Since our global launch in September 2019, there has been a surge of interest from banks and investors worldwide to have a clear and transparent set of rules to measure their financed emissions to assess risk, manage impact, meet the disclosure expectations of important stakeholders, and assess progress to global climate goals.

We owe the globalization of PCAF to the pioneering work of the Dutch financial industry. In 2015, fourteen Dutch financial institutions, led by ASN Bank, started the journey to develop methods to understand their portfolios' contribution to climate change—they strongly believed that measuring financed emissions would enable them to take informed actions to decarbonize their portfolios in order to minimize climate risks and maximize opportunities. They were right. By measuring financed emissions, they were able to identify carbon-intensive hotspots and develop innovative low carbon products for their clients and investees. Their work reveals that measuring financed emissions is the cornerstone of informed climate actions. It is one of the first steps any financial institution should take when embarking upon a process to understand climate risks and opportunities and assessing portfolio alignment in the context of the Paris Agreement.

The PCAF Netherlands success led to the uptake of greenhouse gas accounting methods by North American financial institutions in 2018. After being tried and tested in the Netherlands, Canada and the United States, and bolstered by a public commitment from pioneers of values-based banking from all corners of the world to adopt this approach, many other financial institutions around the globe began to inquire about how this experience could be applied in other countries.

We listened to our peers and understood that it was time to have harmonized methodologies to measure financed emissions that can be used by financial institutions of various sizes and with diverse models wherever they are in the world. The Global GHG Accounting and Reporting Standard that you are about to read is a response to this global request.

The Standard is the result of the tenacious work of financial institutions who are part of the PCAF Global Core Team, who volunteered their time to create it.

We thank the William & Flora Hewlett Foundation and the Ikea Foundation for their generous support of this work, we thank the institutions we work for who provided us with the time to work on something that is of benefit to the industry as a whole, and we thank the hundreds of financial institutions, governmental and nongovernmental organizations who have helped bring this important idea to life.

## The PCAF Steering Committee

Tjeerd  
Krumpelman

Ivan  
Frishberg

Jeroen  
Loots

James  
Niven

Sean  
Wright

Dinesh  
Dulal

Lizzy  
Eilbracht

Peter  
Sandahl



## Foreword by Mark Carney

To achieve net zero emissions by 2050, we need a whole economy transition - every company, every bank, every insurer and investor will have to adjust their business models, develop credible plans for the transition and implement them. Private finance will fund the initiative and innovation of these plans, provided that it has the necessary information, tools and markets.

Financial firms will need to review more than the emissions generated by their own business activity. They must measure and report the financed emissions generated by the companies, properties and projects to which they lend. Some of the largest firms have already committed to doing so and the PCAF initiative will help many more to follow.

The PCAF's industry-led process demonstrates the sector's recognition that climate change and the transition to net zero is a risk that needs to be managed as well as an enormous commercial opportunity to grasp. For this to happen, the sector requires robust, clear and harmonized disclosure of financed emissions; it needs to embed climate risk management into business decisions; and direct capital to economic activities that enable the transition to net zero no later than 2050.

The Global GHG Accounting and Reporting Standard for the Financial Industry is an important milestone that will serve to make significant progress on climate-related financial disclosures, addressing these three important requirements. By using the Standard, the industry will be able to measure financed emissions, a metric that provides the starting point to assess and disclose climate-related risks in line with the Task Force on Climate-related Financial Disclosures (TCFD); set science-based targets using emission-based methods developed by organizations like the Science Based Targets initiative (SBTi); and inform climate strategies and actions that direct capital to support the alignment of financial flows with the Paris Agreement's goals.

As we enter the one year countdown to COP26, now is the time to raise ambition and take action. Every bank, asset manager, asset owner and insurance company should consider how to set net zero targets and use the PCAF guidance to help the world achieve net zero.

**Mark Carney**

**Finance Adviser to the Prime Minister for COP 26 and UN Special Envoy for  
Climate Action and Finance**

## Executive summary

The Partnership for Carbon Accounting Financials (PCAF) is an industry-led initiative. Created in 2015 by Dutch financial institutions, PCAF extended to North America in 2018, and scaled up globally in 2019. PCAF helps financial institutions assess and disclose the greenhouse gas (GHG) emissions from their loans and investments through GHG accounting.

GHG accounting enables financial institutions to disclose these emissions at a fixed point in time and in line with financial accounting periods. Measuring financed emissions allows financial institutions 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 in alignment with the Paris Agreement.

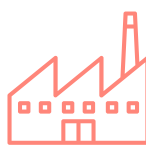
Until now, there has not been a globally accepted standard for the measurement and disclosure of financed emissions. The absence of harmonized methodologies and reporting rules has led to the poor uptake of the accounting of financed emissions and inconsistent disclosures across financial institutions.

Responding to industry demand for a global, standardized GHG accounting approach, PCAF developed the Global GHG Accounting and Reporting Standard for the Financial Industry (the Standard). This Standard has been reviewed by the GHG Protocol and conforms with the requirements set forth in the Corporate Value Chain (Scope 3) Accounting and Reporting Standard for category 15 investment activities.

The Standard provides detailed methodological guidance for asset classes. Widely tested by banks and investors, these methods assist in the measurement and disclosure of GHG emissions associated with six asset classes:



**Listed equity and  
corporate bonds**



**Business loans and  
unlisted equity**



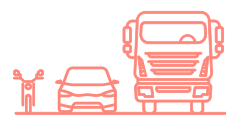
**Project finance**



**Commercial real estate**



**Mortgages**



**Motor vehicle loans**



The Standard provides detailed guidance for each asset class to calculate the financed emissions resulting from activities in the real economy that are financed through lending and investment portfolios. Emissions are attributed to financial institutions based on robust, consistent accounting rules specific to each asset class. By following the methodologies for each, financial institutions can measure GHG emissions for each asset class and produce disclosures that are consistent, comparable, reliable, and clear.

Limited data is often the main challenge in calculating financed emissions; however, data limitations should not deter financial institutions from starting their GHG accounting journeys. Beginning with estimated or proxy data can help identify carbon-intensive hotspots in lending and investment portfolios. The Standard provides guidance on data quality scoring per asset class, facilitating data transparency and encouraging improvements to data quality in the medium and long term. The Standard also provides recommendations and requirements for disclosures, which include a minimum disclosure threshold with flexibility to report beyond this level. Any requirements not fulfilled must be accompanied by an explanation.

Using this Standard equips financial institutions with standardized, robust methods to measure financed emissions and enables them to:

- Assess climate-related risks in line with the Task Force on Climate-related Financial Disclosures (TCFD).
- Set science-based targets (SBTs) using methods developed by the Science Based Targets initiative.
- Report to stakeholders like the Carbon Disclosure Project (CDP).
- Inform climate strategies and actions to develop innovative products that support the transition toward a net-zero emissions economy.

WRI and WBCSD published  
Corporate Value Chain  
(Scope 3) Accounting and  
Reporting Standard

2011



PCAF founded by  
Dutch financial  
institutions

2015



PCAF launched in  
North America

2018



PCAF published 2 reports on  
GHG accounting methods

2019



PCAF launched globally

2019



PCAF launches Global GHG  
Accounting and Reporting Standard  
for the Financial Industry

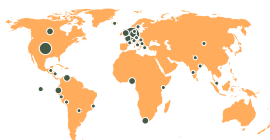
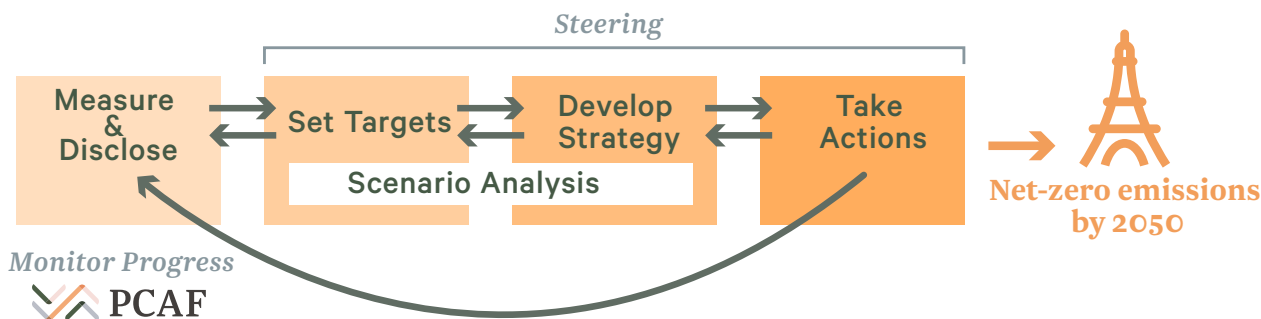
2020



# The GLOBAL GHG ACCOUNTING & REPORTING Standard

## FOR THE FINANCIAL INDUSTRY

Using the Standard is the first step in the journey  
to align with the Paris Agreement



Over 85 financial institutions,  
with over \$ 17 Trillion in financial assets  
committed (November 2020).



This Standard was reviewed by the GHG Protocol and  
is in conformance with the requirements set forth in the  
Corporate Value Chain (Scope 3) Accounting and Reporting  
Standard, for Category 15 investment activities.

### Listed Equity and Corporate Bonds

$$\frac{\text{Outstanding amount}}{\text{EVIC or Total company equity + debt}} \times \text{Company emissions}$$

EVIC = enterprise value including cash

### Business Loans and Unlisted Equity

$$\frac{\text{Outstanding amount}}{\text{EVIC or Total company equity + debt}} \times \text{Company emissions}$$

EVIC = enterprise value including cash

### Project Finance

$$\frac{\text{Outstanding amount}}{\text{Total project equity + debt}} \times \text{Project emissions}$$

## GHG accounting for six asset classes

### Commercial Real Estate

$$\frac{\text{Outstanding amount}}{\text{Property value at origination}} \times \text{Building emissions}$$

### Mortgages

$$\frac{\text{Outstanding amount}}{\text{Property value at origination}} \times \text{Building emissions}$$

### Motor Vehicle Loans

$$\frac{\text{Outstanding amount}}{\text{Total value at origination}} \times \text{Vehicle emissions}$$



Partnership for  
Carbon Accounting  
Financials

The Partnership for Carbon Accounting Financials (PCAF) is an  
industry-led initiative enabling financial institutions to measure and  
disclose greenhouse gas (GHG) emissions of loans and investments.



# 1. Introduction

Introduction

CHAPTER 1

Understand what GHG accounting is

CHAPTER 2

Identify business goals

CHAPTER 3

Review accounting and reporting principles and rules

CHAPTER 4

Review and apply accounting methodologies for each asset class

CHAPTER 5

Report emissions

CHAPTER 6

## The role of the financial sector

Under current national and international policies, the planet is on a trajectory to reach a global increase in temperature between 2.1°C and 3.9°C by 2100 compared to pre-industrial levels.<sup>2</sup> 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 preindustrial levels, all sectors of society need to decarbonize and collectively reach net-zero emissions by 2050. The financial sector can help facilitate the transition in line with a 1.5°C scenario by directing capital to support decarbonization.

To trigger changes in capital flows and signals for all sectors, the financial industry must acknowledge and endorse the need for and pace of decarbonization. The industry should begin by better understanding the climate risks to their portfolio and the greenhouse gas (GHG) emissions (or climate impact) associated with their loans and investments. Measuring financed emissions is crucial in providing this understanding. If financial institutions know the emissions financed by loans and investments, they can better identify and manage risks, navigate emissions reduction goals, act to reduce their portfolio climate impact, and disclose progress. This understanding then triggers internal discussions and engagements with stakeholders to identify concrete actions that help lower financed emissions.

## The role of PCAF and GHG emissions accounting in reporting, managing risks and opportunities, and aligning financial flows with the Paris Agreement

Previously, financial institutions used different approaches and accounting methodologies to measure financed emissions and opted for various reporting metrics, leading to inconsistent assessments of the industry's climate impact. This lack of standardization hampers transparency, comparability, and accountability of the financial sector.

With this issue in mind, banks, investors, and fund managers from five continents partnered to create the Partnership for Carbon Accounting Financials (PCAF).<sup>3</sup> Committed to the measurement and disclosure of the absolute GHG emissions of their portfolios (financed emissions), this industry-led initiative is rapidly expanding in North America, Latin America, Europe, Africa, and Asia Pacific.<sup>4</sup> PCAF aims to standardize the way financial institutions measure and disclose financed emissions and increase the number of financial institutions that commit to measuring and disclosing financed emissions.

Measuring financed emissions is critical for financial institutions that want to improve their climate reporting. Measuring and transparently reporting financed emissions helps financial institutions and their stakeholders understand the climate impact of the organization's lending and investment activities.

Additionally, financed emissions provide useful information to identify and manage climate-related transition risks and opportunities. For example, financed emissions can be used as a

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2 (New Climate Institute and Climate Analytics, 2020)

3 More information about PCAF is found at: <https://carbonaccountingfinancials.com/>

4 A full list of PCAF participants is found at: <https://carbonaccountingfinancials.com/financial-institutions-taking-action#overview-of-institutions>



metric to stress test the resilience of portfolios against climate policies that could have a material effect on the viability of an activity (e.g., carbon pricing). This information is helpful to develop risk management strategies and to identify business opportunities that could support risk management and the transition to a low carbon economy.

Lastly, accounting for financed emissions is an important part of the process that banks and investors take when aligning their lending and investment portfolios with the goals of the Paris Agreement. This process has five non-linear stages:

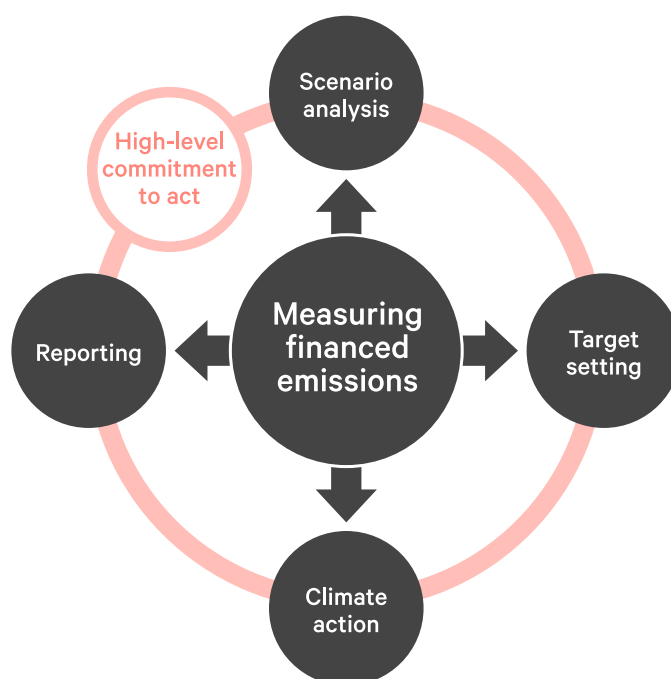
- Measuring and disclosing financed emissions
- Setting science-based targets (SBTs)
- Designing strategies to reach the targets
- Implementing concrete actions to achieve the targets

Financial institutions also measure financed emissions to evaluate their progress against their emissions-based targets.

### Relationship with other financial sector climate initiatives

Multiple climate initiatives for financial institutions have been launched, including high level commitments, scenario analysis, target setting, and concrete climate action and reporting. High level commitments and policies endorsed by C-suite executives drive financial institutions to address climate change. Measuring financed emissions provides the base year emissions for scenario analysis and target setting, informs climate actions, and enables reporting (Figure 1-1).

**Figure 1-1. Measuring financed emissions as the foundation for other initiatives**



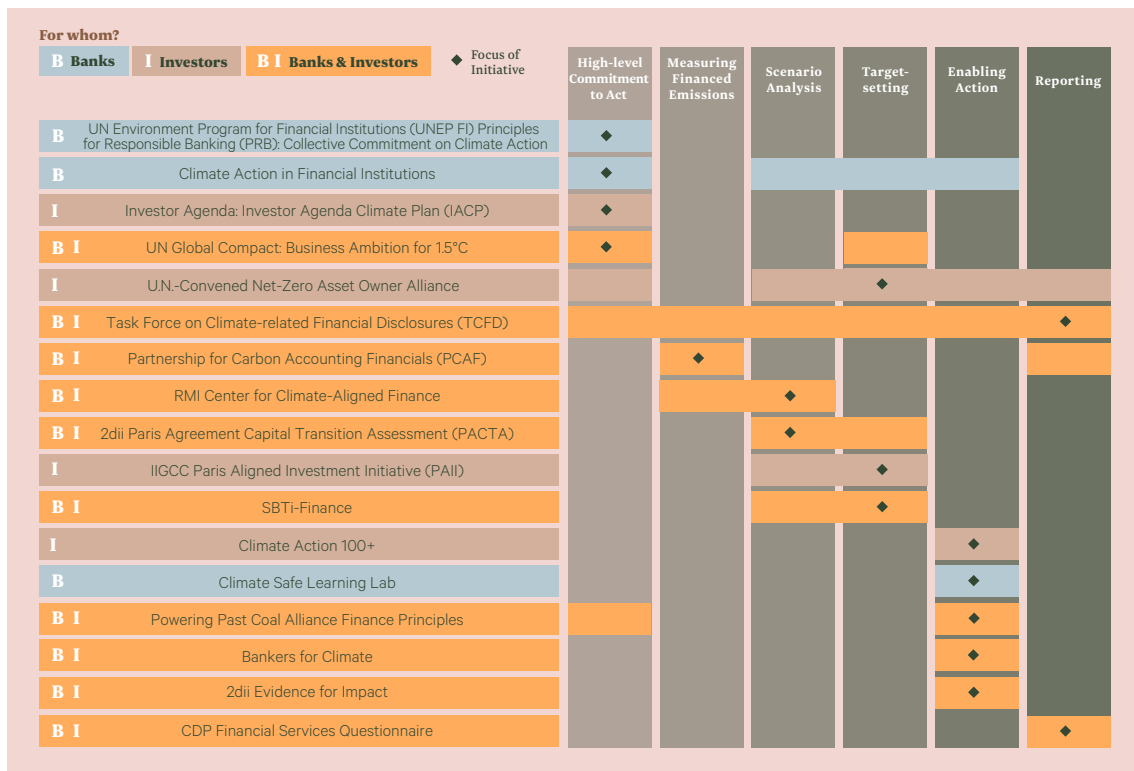
Source: (PCAF, 2020)

There are a number of climate initiatives with a specific target audience and focus in each of these areas (Figure 1-2).

PCAF focuses on measuring financed emissions, complementing the work and services that other initiatives offer to financial institutions. Building synergies is core to PCAF's work, which has led to collaborations with the following initiatives:

- United Nations Environment Programme Finance Initiative (UNEP FI) Principles for Responsible Banking and its Collective Commitment to Climate Action
- United Nations-convened Net-Zero Asset Owner Alliance
- Task Force on Climate-related Financial Disclosures (TCFD)
- Science Based Targets initiative for Financial Institutions (SBTi-FIs)
- Center for Climate-Aligned Finance of Rocky Mountain Institute
- Carbon Disclosure Project (CDP)
- European Commission Technical Expert Group on Sustainable Finance (EU TEG)

**Figure 1-2. Cluster of climate initiatives**



Source: (PCAF, 2020)

## Standardizing GHG emissions accounting for financial institutions

This document is the first edition of the Global GHG Accounting and Reporting Standard for the Financial Industry. Throughout this document, the Global GHG Accounting and Reporting Standard is commonly referred to as the Standard. The purpose of the Standard is to provide financial institutions with transparent, harmonized methodologies to measure and report the emissions they finance through loans and investments in conformance with the requirements of the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard.

The Global GHG Accounting and Reporting Standard was developed by the PCAF Global Core Team, a heterogeneous group of banks and investors of varied sizes and from different regions. This Core Team has wide experience in GHG accounting and consists of: ABN AMRO, Access Bank, Amalgamated Bank, Banco Pichincha, Bank of America, Boston Common Asset Management, Crédit Coopératif and its subsidiary Ecofi, FirstRand Ltd., FMO, KCB, Landsbankinn, Morgan Stanley, Produbanco, Robeco, Triodos Bank, and Vision Banco.

At the end of October 2019, the PCAF Global Core Team kicked off its activities by selecting a set of asset classes that are typical for banks, asset owners, and asset managers globally. These asset classes are the focus of this first edition of the Global GHG Accounting and Reporting Standard. As the Standard and PCAF evolve, additional asset classes and case studies will be added. The Standard currently covers the following asset classes:



**Listed equity and corporate bonds**



**Business loans and unlisted equity**



**Project finance**



**Commercial real estate**



**Mortgages**



**Motor vehicle loans**

Throughout the development of the Standard (October 2019–November 2020), PCAF engaged with civil society organizations to consider their ideas, discuss PCAF methodological approaches, and receive feedback. During August and September 2020, PCAF also held a public consultation with financial institutions, policy makers, data providers, consultants, and nongovernmental organizations (NGOs). More than 200 stakeholders were reached via targeted webinars and 50 stakeholders provided direct feedback to the Standard.

## Built on the GHG protocol

This Global GHG Accounting and Reporting Standard for the Financial Industry builds on the GHG Protocol standards for corporate reporting such as the GHG Protocol Corporate Accounting and Reporting Standard,<sup>5</sup> the Corporate Value Chain (Scope 3)<sup>6</sup> Accounting and Reporting Standard, and the supplemental Technical Guidance for Calculating Scope 3 Emissions.<sup>7</sup> More specifically, this Standard supplements the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard<sup>8</sup> by providing additional detailed guidance per asset class.

The Standard has been reviewed by the GHG Protocol and conforms with the requirements set forth in the Corporate Value Chain (Scope 3) Accounting and Reporting Standard for category 15 investment activities.

Beyond reporting the scope 3 category 15 emissions covered by this Standard, financial institutions shall also measure and report their scope 1 and 2 emissions as well as any other relevant scope 3 emissions categories in line with the GHG Protocol's Standards as mentioned above.

## Expected users of this standard

This standard is written primarily for financial institutions that wish to measure and disclose the GHG emissions associated with their loans and investments, including:

- Commercial banks
- Investment banks
- Development banks
- Asset owners/managers (mutual funds, pension funds, close-end funds, investment trusts)
- Insurance companies

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5 (WRI and WBCSD, 2004)

6 (WRI and WBCSD, 2011)

7 (WRI and WBCSD, 2011) and (WRI and WBCSD, 2013)

8 (WRI and WBCSD, 2011)



## How to read this standard

The Global GHG Accounting and Reporting Standard uses precise language to indicate which provisions are requirements, which are recommendations, and which are allowable options that financial institutions may choose to follow. The following terms are used throughout this Standard:

- “Shall” or “required”: Indicates what is required for a GHG inventory to conform with this Standard.
- “Should”: Indicates a recommendation but not a requirement.
- “May”: Indicates an allowed option.
- “Needs,” “can,” and “cannot”: May be used to provide guidance on implementing a requirement or to indicate when an action is or is not possible.

Figure 1-3 provides the structure of this Standard and the steps for disclosing financed emissions.

**Figure 1-3. Overview of the Standard and steps for disclosing financed emissions**



## 2. The importance of GHG accounting



## What is GHG accounting?

GHG emissions accounting refers to the processes required to consistently measure the amount of GHGs generated, avoided, or removed by an entity, allowing it to track and report these emissions over time. The emissions measured are the seven gases mandated under the Kyoto Protocol and to be included in national inventories under the United Nations Framework Convention on Climate Change (UNFCCC) – carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF<sub>6</sub>) and nitrogen trifluoride (NF<sub>3</sub>). For ease of accounting, these gases are usually converted to and expressed as carbon dioxide equivalents (CO<sub>2</sub>e).

GHG accounting is most commonly used by governments, corporations, and other entities to measure the direct and indirect emissions that occur throughout their value chains as a result of organizational and business activities. According to the GHG Protocol Corporate Accounting and Reporting Standard,<sup>9</sup> direct emissions are emissions from sources owned or controlled by the reporting company. Indirect emissions are emissions that are a consequence of the operations of the reporting company but that occur at sources owned or controlled by another company.

Direct and indirect emissions are further categorized by scope and distinguished according to the source of the emissions and where in an organization's value chain the emissions occur. The three scopes defined by the GHG Protocol – scope 1, scope 2 and scope 3 – are briefly described below and are illustrated in Figure 2-1.

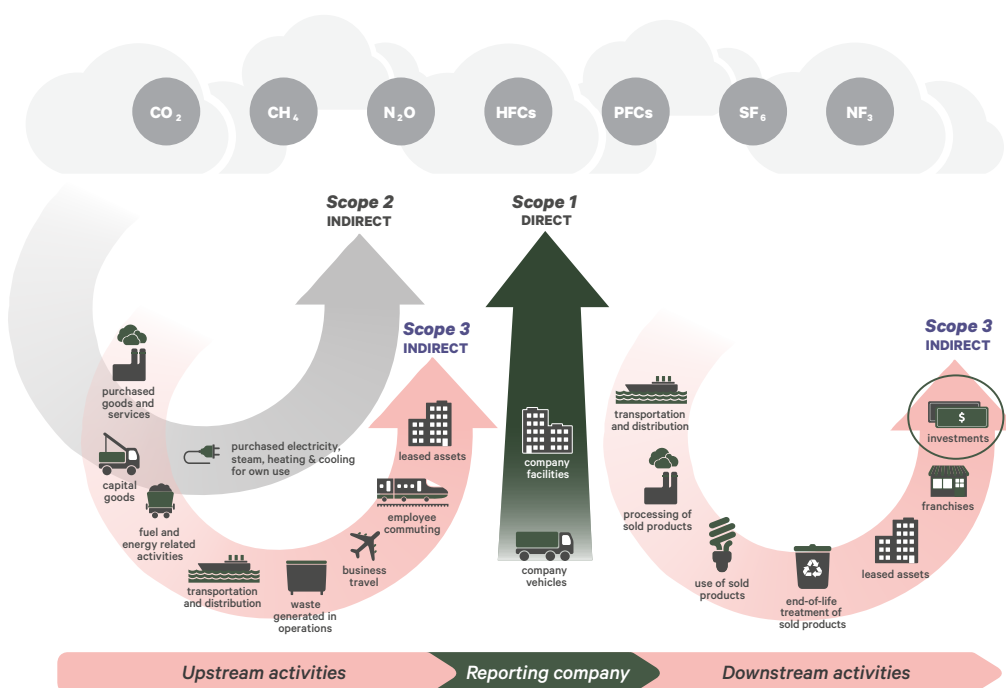
- **Scope 1:** Direct GHG emissions that occur from sources owned or controlled by the reporting company – i.e., emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.
- **Scope 2:** Indirect GHG emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the reporting company. Scope 2 emissions physically occur at the facility where the electricity, steam, heating, or cooling is generated.
- **Scope 3:** All other indirect GHG emissions (not included in Scope 2) that occur in the value chain of the reporting company. Scope 3 can be broken down into upstream emissions that occur in the supply chain (for example, from production or extraction of purchased materials) and downstream emissions that occur as a consequence of using the organization's products or services.

The GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard<sup>10</sup> categorizes scope 3 emissions into 15 categories, which are listed in Figure 2-1. As the figure shows, the emissions resulting from a reporting company's loans and investments fall under Scope 3 downstream emissions, more precisely under Scope 3 category 15 (investments).

GHG accounting of financial portfolios is the annual accounting and disclosure of scope 3 category 15 emissions at a fixed point in time in line with financial accounting periods.

9 (WRI and WBCSD, 2004)

10 (WRI and WBCSD, 2011)

**Figure 2-1. Overview of GHG Protocol scopes and emissions across the value chain**

Source: (WRI and WBCSD, 2011)

## The importance of GHG accounting of loans and investments

To limit dangerous global warming and achieve the goals of the Paris Agreement, global GHG emissions must be cut drastically. GHG accounting is a necessary step for organizations to better manage their emissions and align with the Paris Agreement. For a financial institution, scope 3 category 15 emissions (i.e., financed emissions) are often the most significant part of its GHG emissions inventory and special consideration must be made regarding how these are measured. The Global GHG Accounting and Reporting Standard aims to provide a standardized approach to account for financed emissions, ensuring that the approach used by financial institutions is robust, transparent, and comparable over time and across asset classes. This is crucial because measuring financed emissions is an important step financial institutions take to assess climate-related risks and opportunities, set targets in line with the Paris Agreement, and develop effective strategies to support the decarbonization of society.

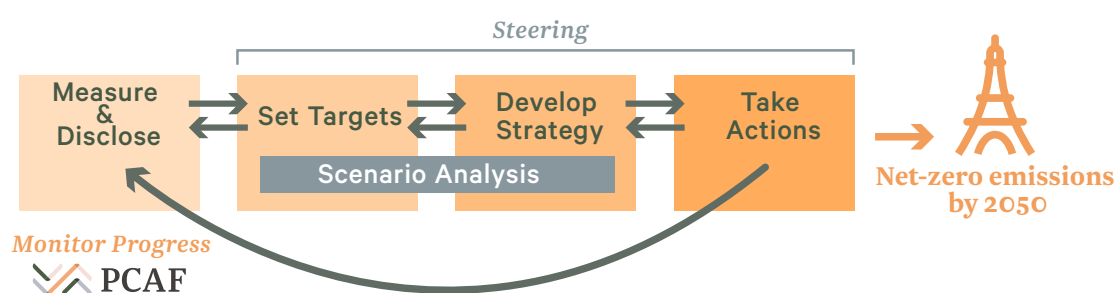
As shown in Figure 1-1, measuring financed emissions is central to activities that enable financial institutions to embed climate action throughout their lending and investment activities. Financed emissions reporting is important for showing stakeholders the climate impact of a financial institution's activities, and the act of making a public disclosure shows that the organization holds itself accountable for these impacts.

Financed emissions are a necessary input for climate scenario analysis. As such, financed emissions are a key metric for financial institutions that want to understand and manage climate-related transition risks and opportunities. As countries strive to meet the commitments defined in

their nationally determined contributions (NDCs),<sup>11</sup> national climate policies will be strengthened and efforts will increase to develop policies that support decarbonization and potentially price carbon-intensive activities through carbon pricing.<sup>12</sup> These policies could have material impacts on the viability of certain loans and investments in carbon-intensive industries. Measuring financed emissions can help financial institutions uncover carbon-intensive hotspots in their portfolios and enable them to take the necessary actions to minimize their exposure to riskier assets and encourage them to develop climate-friendly products such as low carbon funds, green bonds, sustainability-linked bonds, green mortgages, and more.

Figure 2-2 illustrates the five stages financial institutions follow to align with the Paris Agreement. Measuring financed emissions allows financial institutions to identify the emissions baseline for scenario analysis and target setting. Without measuring a clear baseline, financial institutions do not have the knowledge necessary when assessing scenarios and defining their climate targets, let alone gauging their progress in aligning with the Paris Agreement. A robust, transparent, and harmonized approach to measuring financed emissions helps financial institutions make informed decisions on target setting, strategy, and the actions required to decarbonize the economy.

**Figure 2-2. The Paris alignment value chain for financial institutions**



As described in Chapter 1, multiple climate initiatives support the financial sector in decarbonizing their portfolios. Each initiative plays a key role in the Paris Alignment process:

- PCAF focuses on standardizing the measurement and reporting of financed emissions.
- TCFD and CDP provide a framework for disclosure.
- The SBTi-FIs guide setting SBTs.
- Other initiatives, such as Climate Action 100+ and Climate Safe Lending Network, support financial institutions on defining concrete climate strategies and actions.

<sup>11</sup> The Paris Agreement (Article 4, paragraph 2) requires each Party to prepare, communicate and maintain successive NDCs that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.

<sup>12</sup> (World Bank Group, 2020)

## GHG accounting helps measure three types of climate impact: generated emissions, emission removals, and avoided emissions

GHG accounting is the annual corporate accounting and disclosure of GHG emissions financed by loans and investments in the portfolio of a financial institution at a fixed point in time in line with financial accounting periods. Financed emissions can be measured as amounts of GHGs generated, avoided, or removed by an institution. The volume of GHG emissions emitted and financed by an institution is commonly referred to as its **generated emissions**. To limit climate change and meet the goals of the Paris Agreement, financiers must actively seek out actions that reduce generated emissions in absolute terms (i.e., absolute emissions<sup>13</sup>).

Not all loans and investments result in GHG emissions, and some may result in mitigating activities. For instance, project-specific loans and investments in the forestry and land use sector, carbon capture and utilization, or carbon capture and storage can result in CO<sub>2</sub> being sequestered or removed from the atmosphere and stored in solid or liquid form, removing its harmful global warming effect. Investments in afforestation projects can directly result in newly planted trees absorbing CO<sub>2</sub> from the air. The volume of CO<sub>2</sub> absorbed is considered an **emission removal** that can also be quantified and reported, demonstrating a type of positive contribution toward decarbonization.

Measuring emission removals is complex, especially where issues of permanence and land use change come into play. While PCAF acknowledges that emission removals are integral in combatting climate change, due to the complexity of the calculations and the data requirements, this edition of the Standard does not provide guidance on how to measure these emission removals. The GHG Protocol is, however, developing additional accounting guidance on carbon removals and emissions from land use. For more information on the reporting of carbon removals, PCAF refers to this forthcoming guidance from the GHG Protocol.

Similarly, project-specific loans and investments in renewable energy projects can result in emissions being avoided as they displace the emissions that normally would have occurred without the project's implementation. These emissions are referred to as **avoided emissions** and reporting them is a way to demonstrate a quantifiable positive contribution to decarbonization. For the financial sector, which finances projects that lead to avoided emissions, quantifying this effect is relevant.

Reporting on emission removals and avoided emissions shall always be done separately from the financial institution's scope 1, 2, and 3 GHG inventories.

## GHG accounting enables benchmarking

Measuring financed emissions in absolute terms (i.e., absolute emissions) provides financial institutions with the necessary baseline for climate action to align with the Paris Agreement. However, normalized data is often also useful for banks and investors to manage climate transition risk, set targets, or create new products. Normalizing the data means translating the absolute financed emissions to an emission intensity metric (emissions per a specific unit), and

<sup>13</sup> The GHG Protocol often refers to generated emissions as absolute emissions. In this standard, where the term "absolute emissions" is used, it is referring to generated emissions and not values relating to avoided emissions or emission removals.



different intensity metrics can be used for different purposes. A wide array of intensity metrics is applied in the market and each has its own merits. Table 2-1 lists the most common metrics.

All of the intensity metrics shown in Table 2-1 can be useful for steering. As the table shows, economic emissions intensity is the absolute emissions divided by the loan and investment volume, expressed as tCO<sub>2</sub>e/€M invested or loaned. It can be useful for comparing different portfolios or parts of portfolios and for managing climate transition risks. Physical emissions intensity is the absolute emissions divided by an output value, expressed as tCO<sub>2</sub>e/MWh, tCO<sub>2</sub>e/ton product produced. It can be useful for setting SBTs and for comparing the emissions intensity of companies operating in the same sector. The weighted average carbon intensity (WACI)<sup>14</sup> is expressed as tCO<sub>2</sub>e/€M company revenue<sup>15</sup> and can be used to understand a portfolio's exposure to carbon-intensive companies.

**Table 2-1. Financed emissions metrics<sup>16</sup>**

Metric	Purpose	Description
<b>Absolute emissions</b>	To understand the climate impact of loans and investments and set a baseline for climate action	The total GHG emissions of an asset class or portfolio
<b>Economic emissions intensity</b>	To understand how the emissions intensity of different portfolios (or parts of portfolios) compare to each other per monetary unit	Absolute emissions divided by the loan and investment volume, expressed as tCO <sub>2</sub> e/€M invested
<b>Physical emissions intensity</b>	To understand the efficiency of a portfolio (or parts of a portfolio) in terms of total carbon emissions per unit of a common output	Absolute emissions divided by an output value, expressed as tCO <sub>2</sub> e/MWh, tCO <sub>2</sub> e/ton product produced
<b>Weighted average carbon intensity (WACI)<sup>17</sup></b>	To understand exposure to carbon-intensive companies	Portfolio's exposure to carbon-intensive companies, expressed as tCO <sub>2</sub> e/€M company <sup>18</sup> revenue

<sup>14</sup> (TCFD, 2017)

<sup>15</sup> The word company refers to the financial institution's borrower or investee.

<sup>16</sup> Adapted from (CRO Forum, 2020)

<sup>17</sup> (TCFD, 2017)

<sup>18</sup> The word company refers to the financial institution's borrower or investee.



# 3. Using GHG accounting to set and achieve business goals





Understanding the climate impact of financial portfolios makes good business sense for financial institutions. GHG accounting can help financial institutions achieve multiple objectives, such as creating transparency for stakeholders, managing financial risks associated with climate policies and regulations, creating new financial products to further the transition to net zero, and aligning financial flows with the goals of the Paris Agreement (Figure 3-1). Financial institutions cite these business goals (which this chapter describes in greater detail) as the key reasons for undertaking an assessment of financed emissions, but this list is by no means exhaustive.

**Figure 3-1. GHG accounting can help financial institutions meet multiple business goals**



The level of detail captured in the financed emissions assessment could dictate how well the inventory can meet the financial institution's business goals. For example, if a financial institution wishes to use the inventory to manage risk, it may consider measuring and recording sector-level emissions from its borrowers or investees to identify carbon-intensive industry investments in its portfolios. Other financial institutions may want to structure their inventory in a way that helps them track their financed emissions reduction goals year over year. In the end, what is captured in the inventory should serve the business goals of the financial institution.

### Business goal 1: Create transparency for stakeholders

Financial institutions motivated to be more transparent about their climate impact can use GHG accounting to measure the financed emissions associated with their loans and investments. Since the economic crisis of 2007-2009, a wide range of stakeholders have demanded more transparency around how their money is invested. In response to demand and the consensus that climate change poses a considerable threat to the global economy, the Financial Stability Board (FSB) launched the industry-led TCFD. The remit of the TCFD was to develop recommendations for "consistent, comparable, reliable, clear and efficient climate-related disclosures by companies."<sup>19</sup> The TCFD framework<sup>20</sup> has expanded since the recommendations were launched in 2017 to be the global guidance on how companies should disclose their climate-related risks and opportunities. At the time of this Standard's publication, TCFD-recommended disclosures are voluntary.<sup>21</sup> However, with strong backing from the central banks, the Supervisors Network for Greening the Financial System, and the industry itself, it is likely that companies will be faced with new regulatory requirements in this arena.

<sup>19</sup> More information about FSB can be found at:

<https://www.fsb.org/work-of-the-fsb/policy-development/additional-policy-areas/climate-related-financial-disclosures/>

<sup>20</sup> (TCFD, 2017)

<sup>21</sup> Except in New Zealand, where the government introduced mandatory TCFD disclosures in September 2020:

<https://bit.ly/2TWUxwm> Also, the UK announced its intention to make TCFD-aligned disclosures mandatory across the economy by 2025, with a significant portion of mandatory requirements in place by 2023. <https://bit.ly/3kpe6bB>

For financial institutions, a key facet of TCFD disclosure relates to their lending and investment activities. This facet is recognized by CDP, which—in aligning with the TCFD framework—adapted its 2020 climate questionnaire for the financial sector to include a section on the reporting of scope 3 category 15 (investment) emissions. The first step of this disclosure is measurement. Information on how the PCAF methodologies support CDP in creating transparent reporting can be found in Box 1.

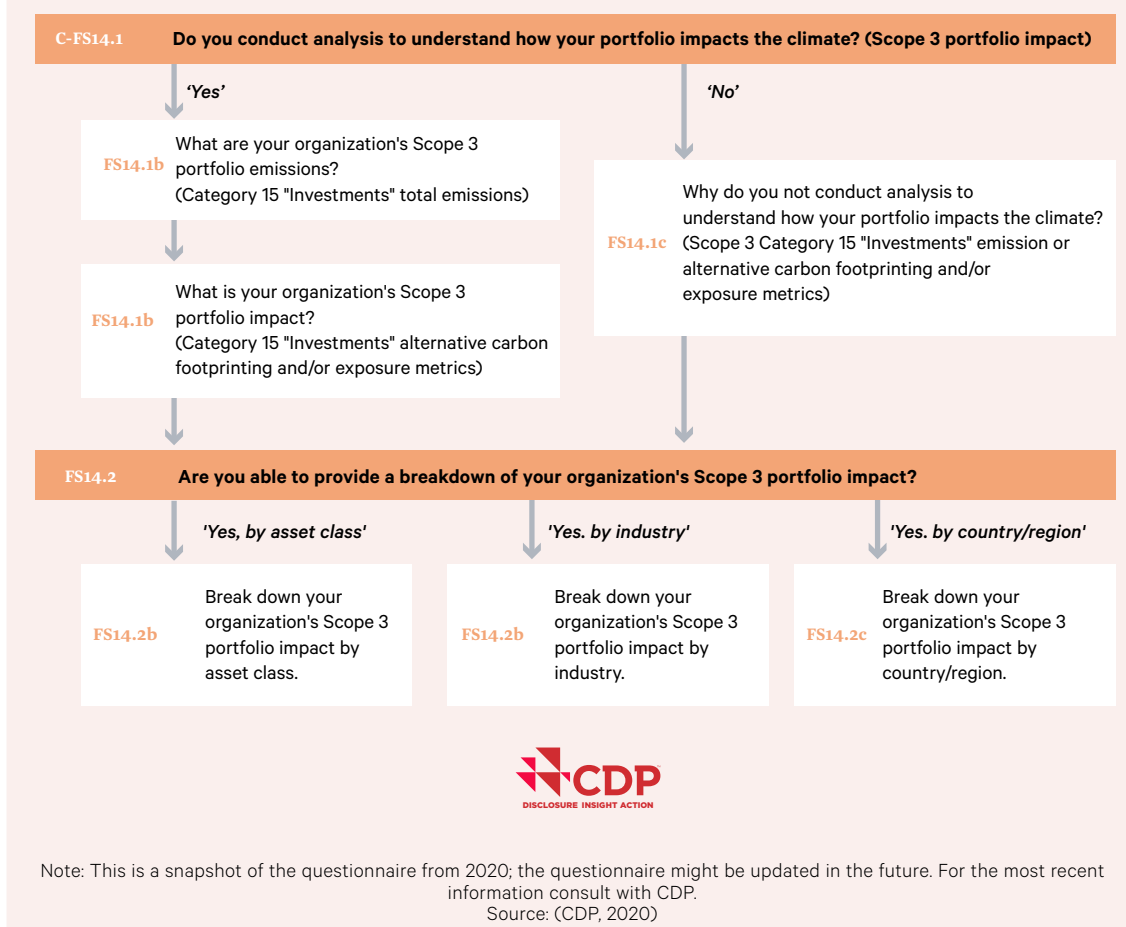
Creating transparency for internal stakeholders can also be a business goal for financial institutions. Carrying out an assessment of financed emissions allows a financial institution's board members and senior management to get a better picture of their organization's impact on the climate and how to steer activities toward the Paris Agreement goals. By measuring and disclosing financed emissions, and thereby creating opportunities for climate disclosure, financial institutions can internally align on their role, as well as the financial sector's responsibility as a whole, in the transition to a net-zero economy.

**Box 1. PCAF supports CDP in creating transparency for stakeholders**

Since its inception in 2000, CDP has evolved to become the globally accepted disclosure system for investors, companies, cities, states, and regions to report and manage their environmental impacts. In response to the TCFD's recommendations highlighting the importance of indirect financing impacts (alongside the disclosed operational impacts), CDP adapted its climate change questionnaire for the financial services sector to include questions about financed emissions. From 2020 onward, CDP asks financial institutions to disclose their scope 3 category 15 (investments) emissions, along with the breakdown of these emissions by asset class, sector, and geography. The Global GHG Accounting and Reporting Standard directly supports financial institutions in answering these questions by providing asset class-specific methodologies and guidance for calculating financed emissions that allow for disclosures on these levels. In its questionnaire, CDP names PCAF as a key framework that can be used for measuring and reporting.

PCAF and CDP collaborate closely to provide transparent disclosures for stakeholders to better understand financial institutions' portfolio alignment to global climate goals and their exposure to carbon-intensive industries.

Figure 3-2. Extract from the CDP climate change 2020 questionnaire



## 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 carbon-intensive assets. Such lending and investment activities could suffer setbacks due to the introduction of carbon prices and anti-fossil fuel policies and regulations.

Understanding the exposure to risk is at the heart of TCFD's mission. TCFD's guidance notes that financial institutions that provide loans to or invest in companies with direct exposure to climate-related risks (e.g., fossil fuel producers, fossil fuel-based utilities, property developers and owners, or agricultural and food companies) may accumulate climate-related risks through their credit and equity holdings.<sup>22</sup>

Additionally, financial institutions that do not disclose their climate-related risks could face reputational risk, especially when peers are increasingly doing so. Measuring and disclosing financed emissions according to the Standard and reporting according to TCFD recommendations is a way for financial institutions to manage their climate-related reputational risk.

22 (TCFD, 2017)

Applying the GHG accounting methods in this Standard, financial institutions can identify areas of significant exposure to carbon-intensive assets across their lending and investment portfolio and use this information as the basis to assess climate risk scenarios. By disclosing in line with the recommendations and requirements in Chapter 6 and the TCFD framework, financial institutions can show they are serious about climate action. Box 2 describes how the Standard aligns with and adds value to the TCFD framework.

### **Box 2. PCAF supports the TCFD framework in identifying and managing climate risk**

One of the goals of the TCFD framework is to measure and disclose the risks posed to organizations by climate-related policies and regulations that are implemented to further the transition to a net-zero economy. PCAF directly supports this objective by providing financial institutions with methodologies to measure financed emissions and a total value for the absolute emissions associated with asset classes in their loan and investment portfolios. As a result of emission assessments, financial institutions can identify carbon-intensive hotspots that could be subject to higher transition risk.

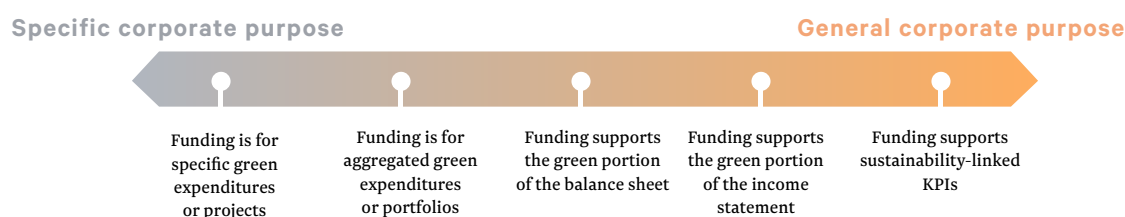
The quantification of financed emissions, the expected trajectory of these emissions, and the ability of banks and investors to reduce emissions over time are important metrics to estimate the impact of transition risks and to mitigate these risks by steering portfolios in line with the transition to a net-zero economy.



### **Business goal 3: Develop climate-friendly financial products**

Included in the TCFD framework is disclosure related to business opportunities associated with the transition to a low carbon economy.<sup>23</sup> According to the framework, opportunities are categorized as resource efficiency, energy source, products and services, markets, and resilience. For financial institutions, significant opportunities exist in each category, especially relating to sustainable finance products. For example, as Figure 3-3 shows, sustainable finance products such as bonds have evolved—from green bonds used to finance a specific corporate purpose (e.g., green-eligible projects such as wind farms) to bonds that are solely focused on general corporate sustainability purposes, such as sustainability-linked bonds (i.e., the full business of the issuer commits to a sustainable target, meaning the bond is connected to the sustainable transition of the business).

23 (TCFD, 2017)

**Figure 3-3. Evolution of green products in the bond market**

With the transition to a low carbon economy, financial institutions can develop innovative products and services that enable their clients to decarbonize their business activities. By measuring financed emissions and using the intensity metrics listed in Table 2-1, financial institutions can see which sectors and businesses require the most help in their decarbonization 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

Financial institutions' commitments to set SBTs,<sup>24</sup> transition their investment portfolios to net-zero GHG emissions by 2050 (e.g., Net-Zero Asset Owner Alliance<sup>25</sup>), and align their lending with the objectives of the Paris Agreement (e.g., Banks Collective Commitment to Climate Action<sup>26</sup>) are examples of this business goal.

Financial institutions that want to align their financial flows with the goals of the Paris Agreement implement portfolio GHG accounting to understand the absolute emissions they finance in the real economy. These institutions use this information as the basis for analyzing decarbonization scenarios and setting emission-based targets at the asset class or sector level. While other climate initiatives focus on scenario analysis and target setting (see Chapter 1), PCAF has been established to focus solely on GHG accounting of financial portfolios. By undertaking GHG accounting, financial institutions are equipped with a metric that can help track absolute emissions year over year and compare it with their financed emissions goals.

Box 3 shows how the PCAF GHG accounting methods offered in this Standard align with SBTi's framework for setting science-based emission reduction targets. SBTi's target-setting guidance for financial institutions was published in October 2020<sup>27</sup> and includes case studies of banks and investors using PCAF GHG accounting methods as a precursor to SBTs.<sup>28</sup>

Next to setting targets, aligning financial flows with the Paris Agreement means that financial institutions take concrete actions to transition their portfolio to net-zero financed emissions by 2050. In this process, banks and investors could identify opportunities to develop new products that help borrowers and investees reduce their own emissions.

<sup>24</sup> Information about SBTs for financial institutions can be found at: <https://sciencebasedtargets.org/financial-institutions>

<sup>25</sup> Information about the Net Zero Asset Owner Alliance can be found at: <https://www.unepfi.org/net-zero-alliance>

<sup>26</sup> Information about the Collective Commitment to Climate Action by signatories of the Principles of Responsible Banking can be found at <https://www.unepfi.org/banking/bankingprinciples/collective-commitment>

<sup>27</sup> (SBTi, 2020)

<sup>28</sup> More information about the SBTi for financial institutions can be found at: <https://sciencebasedtargets.org/financial-institutions>

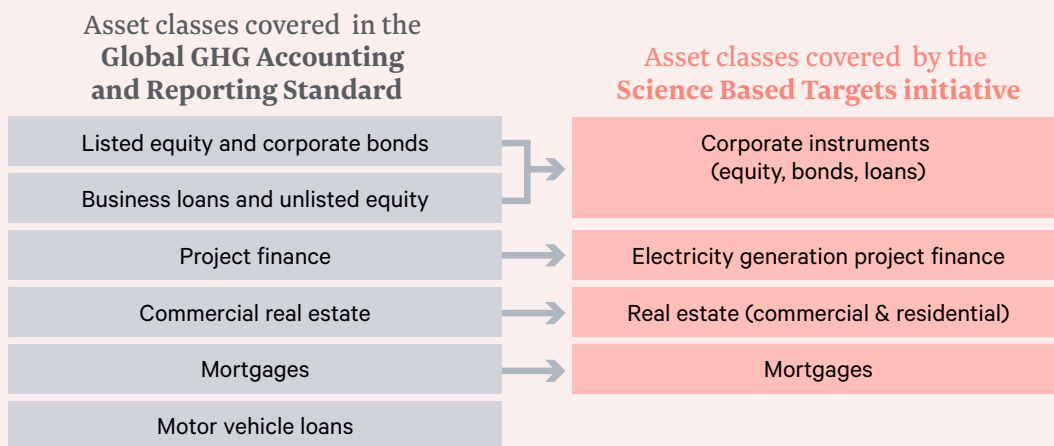
**Box 3. Steering decarbonization: from GHG accounting to setting SBTs**

Financial institutions that decide to set SBTs by using the Sectoral Decarbonization Approach (SDA) need to measure their financed emissions to identify the baseline from which targets would be established and to measure progress against the targets.

The SBTi framework for the financial sector enables financial institutions to align lending and investment portfolios with the Paris Agreement's goals. Financial institutions that set SBTs and work toward attaining those targets act on opportunities to finance the net-zero emission transition.

The SDA is an SBT method that involves setting emissions-based targets, in which GHG accounting is a fundamental step of the process. The asset classes covered in the Global GHG Accounting and Reporting Standard match the four asset classes included in the SBT framework.

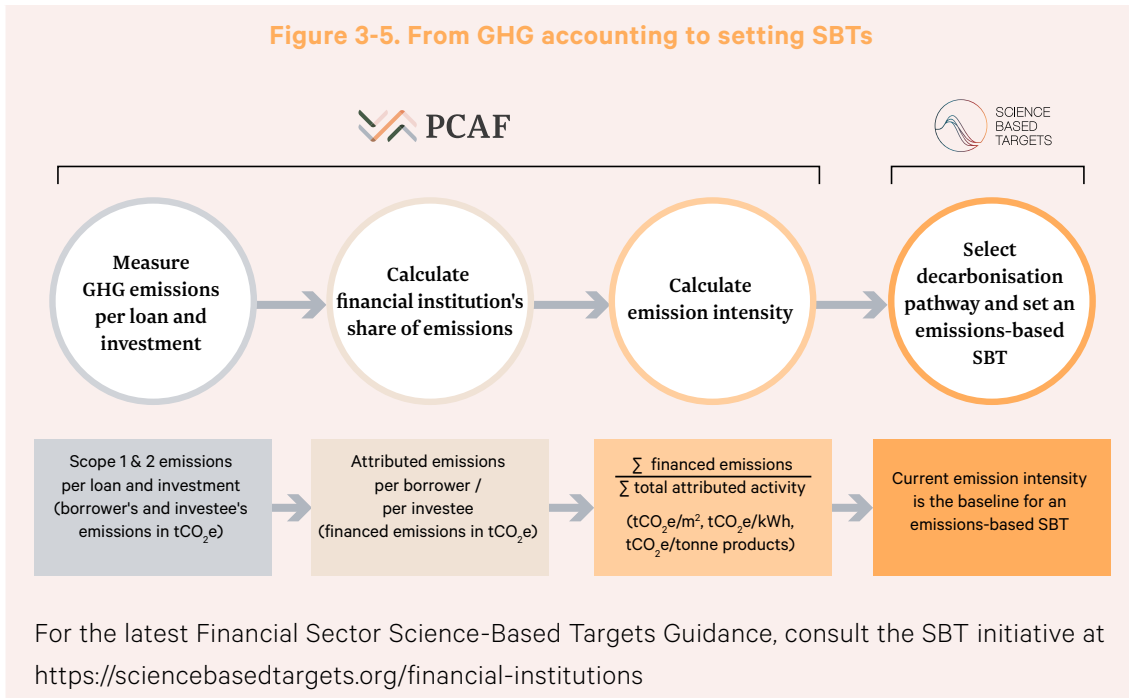
**Figure 3-4. Asset classes covered by PCAF and SBTi**



Financial institutions may use GHG accounting to screen and prioritize the parts of the portfolio that would be the focus for target setting (i.e., asset classes and sectors). Additionally, financial institutions measure financed emissions to determine the emission baselines from which emission-based SBTs are set. To track progress against the emissions-based target, financial institutions also need to measure and disclose their financed emissions annually.

Determining sector-specific emissions intensity at the asset class or sector level is the starting point to apply the SDA for target setting. Sector-specific emissions intensity refers to financed emissions per unit of activity data (e.g., kgCO<sub>2</sub>e/m<sup>2</sup>, gCO<sub>2</sub>e/kWh, tonCO<sub>2</sub>e/ton cement). Three steps are taken to derive emission intensities, as Figure 3-5 shows:

Figure 3-5. From GHG accounting to setting SBTs





# 4. Principles and requirements of GHG accounting for financials

Introduction

CHAPTER 1

Understand what GHG accounting is

CHAPTER 2

Identify business goals

CHAPTER 3

Review accounting and reporting principles and rules

CHAPTER 4

Review and apply accounting methodologies for each asset class

CHAPTER 5

Report emissions

CHAPTER 6



To create this Standard, PCAF harnessed the GHG accounting principles from the GHG Protocol Corporate Accounting and Reporting Standard<sup>29</sup> and the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard.<sup>30</sup> Based on these principles, PCAF developed an additional set of five overarching rules to guide accounting and reporting for financial institutions.

## 4.1 GHG accounting requirements derived from the GHG Protocol's principles

Like financial accounting and reporting, GHG accounting and reporting follows generally accepted principles to ensure that an organization's disclosure represents an accurate, veritable, and fair account of its GHG emissions. The core principles of GHG accounting are set out in the GHG Protocol Corporate Accounting and Reporting Standard<sup>31</sup> and the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard.<sup>32</sup> The GHG Protocol's five core principles are completeness, consistency, relevance, accuracy, and transparency. The Global GHG Accounting and Reporting Standard for the Financial Industry follows these five core principles and provides additional requirements on the application of these principles that are directly relevant for financial institutions wishing to assess their financed emissions (Figure 4-1).

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29 (WRI and WBCSD, 2004)

30 (WRI and WBCSD, 2011)

31 (WRI and WBCSD, 2004)

32 (WRI and WBCSD, 2011)

**Figure 4-1. Additional PCAF requirements of GHG accounting and reporting are derived from the GHG Protocol's five principles**

## GHG Protocol principles for scope 3 inventories

### Completeness

Account for and report on all GHG emission sources and activities within the inventory boundary. Disclose and justify any specific exclusions.

### Consistency

Use consistent methodologies to allow for meaningful performance tracking of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.

### Relevance

Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users — both internal and external to the company

### Accuracy

Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable confidence as to the integrity of the reported information.

### Transparency

Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.

## Additional PCAF requirements

### Recognition

Financial institutions shall account for all financed emissions under Scope 3 category 15 (Investment) emissions, as defined by the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard. Any exclusions shall be disclosed and justified.

### Measurement

Financial institutions shall measure and report their financed emissions for each asset class by “following the money” and using the PCAF methodologies. As a minimum, absolute emissions shall be measured, however avoided and removed emissions can also be measured if data is available and methodologies allow.

### Attribution

The financial institution's share of emissions shall be proportional to the size of its exposure to the borrower's or investee's total (company or project) value.

### Data quality

Financial institutions shall use the highest quality data available for each asset class and improve the quality of the data over time.

### Disclosure

Public disclosure of the results of PCAF assessments is crucial for external stakeholders and financial institutions using the methodology to have a clear, comparable view of how the investments of financial institutions contribute to the Paris climate goals.

## 4.2 Additional requirements for accounting and reporting financed emissions

This subchapter describes the additional requirements for GHG accounting for financials and how these requirements guide accounting for and reporting financed emissions regardless of the loan and investment type. Chapter 6 includes additional details on reporting.

### Recognition

According to the GHG Protocol Corporate Accounting and Reporting Standard,<sup>33</sup> organizations can choose from three approaches when defining their organizational boundaries and consolidating the GHG emissions measured and reported in their inventories:

- Equity approach
- Financial control approach
- Operational control approach

The selection of one of these approaches affects which activities in the company's value chain are categorized as direct emissions (i.e., scope 1 emissions) and indirect emissions (i.e., scope 2 and scope 3 emissions).<sup>34</sup>

For consistency in reporting across organizations and reporting periods, this Standard requires financial institutions to measure and report their GHG emissions using either the operational or financial control approach. As explained in Box 4, this means that emissions from financial institutions' loans and investments (without operational or financial control<sup>35</sup>) will be reported under their scope 3 category 15 (investments) emissions, as defined by the GHG Protocol Value Chain (Scope 3) Accounting and Reporting Standard.<sup>36</sup> This requirement eliminates inconsistencies in accounting that could arise from using the equity control approach, which would require scope 1 and 2 emissions from all equity investments to be reported under the financial institution's scope 1 and 2 emissions (according to its share of equity in the operation).

As a result, the Standard provides a harmonized approach that can be used by financial institutions wishing to account for and disclose their scope 3 category 15 (investments) emissions (otherwise known as their financed emissions), and these are the sole focus of this Standard. Financial institutions following the Standard are required to report all financed emissions under scope 3 category 15 and disclose and justify any exclusions.

<sup>33</sup> (WRI and WBCSD, 2004)

<sup>34</sup> (WRI and WBCSD, 2004)

<sup>35</sup> Only in cases that a financial institution has control (operational or financial, depending on the approach chosen) over the operations of the borrower, or investee, 100% of their emissions will be included within the organizational boundaries of the financial institution and, as a result, included under scope 1 and 2 emissions. This can occur when a financial institution holds a controlling equity share in the investee. In general, however, most of the financial sector's loans and investments are not held to gain control over their borrower or investee.

<sup>36</sup> (WRI and WBCSD, 2011)

Beyond reporting the scope 3 category 15 emissions covered by this Standard, financial institutions shall also measure and report their own scope 1 and 2 emissions as and any other relevant scope 3 emissions categories in line with the GHG Protocol's standards.

Box 4 details consolidation approaches as applied to the financial sector.

**Box 4. Why the Global GHG Accounting and Reporting Standard requires financial institutions to measure and report financed emissions using the operational or financial control approach**

The GHG Protocol Corporate Accounting and Reporting Standard<sup>37</sup> presents three consolidation approaches when preparing GHG emission inventories: the equity approach, the financial control approach, and the operational control approach. These consolidation approaches are intended to define the organizational boundaries of the company for the purposes of accounting and reporting GHG emissions. The selection of one of these approaches affects which activities in the company's value chain are categorized as direct emissions (i.e., scope 1 emissions) and indirect emissions (i.e., scope 2 and scope 3 emissions).

Under the **equity approach**, an organization accounts for GHG emissions from operations according to its share of equity—or ownership—in the operation. So, holding a 15% equity share in another organization would require including 15% of its emissions across all its emission scopes.

Alternatively, an organization can report using the **control approach**, whereby the company reports 100% of the GHG emissions over which it has control as if these emissions were its own (i.e., 100% of direct emissions are reported under scope 1 and 100% of indirect emissions are reported under scope 2 or 3, respectively). Where the company owns an interest but does not have control, it does not account for GHG emissions from operations as part of its scope 1 and 2 emissions. However, emissions from such operations will be reported under scope 3 emissions according to its relative share of ownership.<sup>38</sup>

A control approach can be subclassified as either financial control or operational control, and companies using the control approach must pick between these two options for reporting. Using the **financial control approach**, the organization shall report 100% of emissions for all activities in the company where it can directly influence financial and operational policies and has the potential to benefit economically from the company's activities. Using the **operational control approach**, an organization shall account for 100% of emissions from operations over which it or one of its subsidiaries has control and the authority to introduce and implement operational policies. In most cases, whether an operation is controlled by the company or not does not differ between the financial control or operational control approach.

Box continues on next page ->

37 (WRI and WBCSD, 2004)

38 In practice, using a control approach means that when a company has control over an operation 100% of the scope 1 and 2 emissions of this operation are also reported under the companies' scope 1 and 2 footprint.

The consolidation approach used by a financial institution has a significant impact on how it accounts for its financed emissions. Choosing the equity approach would require scope 1 and 2 emissions from all equity investments to be reported under the financial institution's scope 1 and 2 emissions (according to its share of equity in the operation), whereas financed emissions from other asset classes would end up in scope 3.

However, when choosing a control approach only emissions from those operations where the financial institution, through its investments, holds a controlling interest would end up in its scope 1 and 2 emissions. In all other cases financed emissions end up in scope 3 category 15. As financial institutions' investments in equity or debt are typically not intended to hold a controlling interest, this Standard requires financial institutions to measure and report their GHG emissions using either the operational or financial control approach. This requirement allows for consistent reporting of financed emissions in scope 3 emission category 15.

## Measurement

"Follow the money" is a key tenet for GHG accounting of financial assets, meaning that the money should be followed as far as possible to understand and account for the climate impact in the real economy (i.e., emissions caused by the financial institution's loans and investments).

Financial institutions shall measure and report their financed emissions for each asset class using the methodologies set out in this Standard and covering the seven GHGs required under the Kyoto Protocol. As a minimum, absolute GHG emissions resulting from loans and investments (scope 3 category 15 emissions) in the reporting year shall be measured. In addition, and when relevant, emission removals should be measured and reported separately. Furthermore, avoided emissions from renewable power projects may be measured and reported separately.

As a basis for reporting emissions, financial institutions shall choose a fixed point in time to determine its lending and investment positions and calculate an attribution factor, such as the last day of its fiscal year (e.g., June 30 or December 31). The GHG accounting period shall align with the financial accounting period.

## Attribution

According to the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, GHG emissions from loans and investments should be allocated to the reporting financial institutions based on the proportional share of lending or investment in the borrower or investee.<sup>39</sup> Attribution is based on annual emissions of the borrower and investee; as a result, GHG emissions are reported on at least an annual basis.

39 (WRI and WBCSD, 2011)

The methodologies in the Standard apply the same general attribution principles across all asset classes (Figure 4-2):

1. Financed emissions are always calculated by multiplying an attribution factor (specific to that asset class) by the emissions of the borrower or investee.
2. The attribution factor is defined as the share of total annual GHG emissions of the borrower or investee that is allocated to the loans or investments.
3. The attribution factor is calculated by determining the share of the outstanding amount of loans and investments of a financial institution over the total equity and debt of the company, project, etc. that the financial institution is invested in.

The use of this common denominator, including both equity and debt funding, is important because:

1. It ensures the use of one common denominator across all asset classes, which is in line with leading practices in the financial sector.
2. It does not differentiate between equity and debt as both contribute to total finance of the borrower or investee (and indirectly their emissions) and are, therefore, deemed equally important.
3. It ensures 100% attribution of emissions over equity and debt providers and avoids double counting of emissions between equity and debt providers. This is specifically important for financial institutions that hold both equity and debt positions within the same companies or projects.

**Figure 4-2. The general approach to calculate financed emissions**

$$\text{Financed emissions} = \sum_i \text{Attribution factor}_i \times \text{Emissions}_i \quad (\text{with } i = \text{borrower or investee})$$

$$\text{Attribution factor}_i = \frac{\text{Outstanding amount}_i}{\text{Total equity} + \text{debt}_i}$$

Double counting - which occurs when GHG emissions are counted more than once in the financed emissions calculation of one or more institutions - should be minimized as much possible. Double counting occurs between the different scopes of emissions from loans and investments when a financial institution lends or invests in companies or projects in the same value chain.<sup>40</sup> This form of double counting cannot be avoided but can be made more transparent by separately reporting the scope 1, 2, and 3 emissions of loans and investments (see requirements on this in Chapter 6).

<sup>40</sup> The scope 1 emissions of one company can be the upstream scope 2 or 3 emissions of its customer. For example, scope 1 emissions from a utility providing energy to a company would end up in the scope 2 inventory of that company. If both companies are receiving funding from the same financial institution, these emissions would be double counted within its inventory.

Double counting can take place at five levels:

- Between financial institutions
- In cofinancing the same entity or activity
- Between transactions within the same financial institutions
- Across different asset classes
- Within the same asset class

Double counting between cofinancing institutions and between transactions within the same asset class of a financial institution are avoided by using the appropriate attribution rules consistently. PCAF defines attribution rules for each method described in this Standard. By using the correct attribution method, double counting of emissions between financial institutions can be minimized.

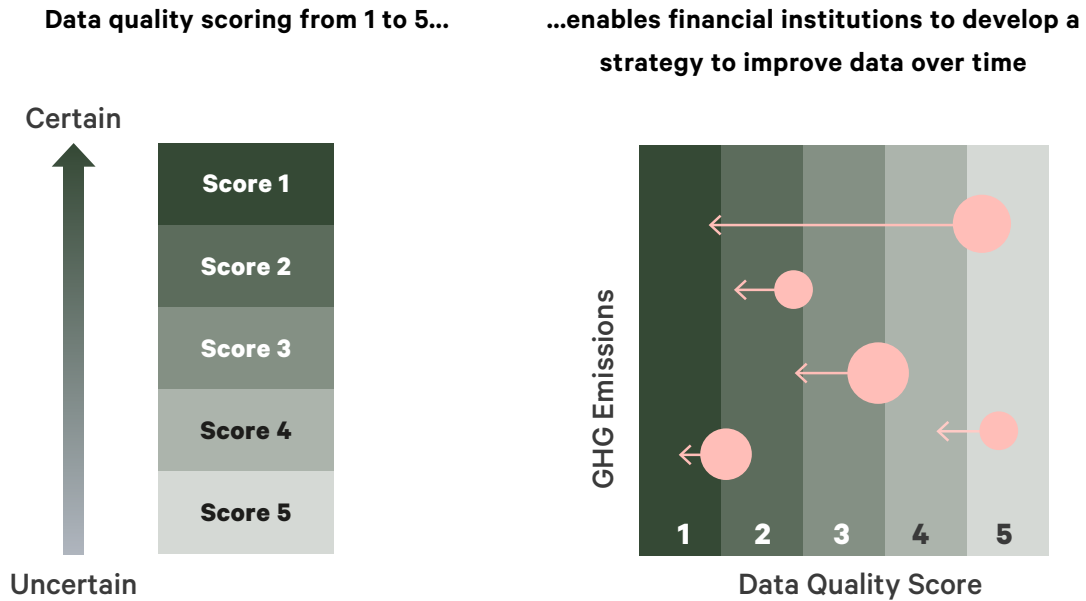
Additional asset class-specific information on attribution can be found in Chapter 5.

## **Data quality**

Financial institutions shall ensure their GHG accounting appropriately reflects the GHG emissions of their loans and investments and serves the decision-making needs of internal and external stakeholders. To safeguard these outcomes, financial institutions should use the highest quality data available for each asset class for calculations and, where relevant, improve the quality of the data over time. PCAF recognizes that high quality data can be difficult to come by when calculating financed emissions, particularly for certain asset classes. However, data limitations should not deter financial institutions from taking the first steps toward preparing their inventories, as even estimated or proxy data can help them identify carbon-intensive hotspots in their portfolios, which can inform their climate strategies. Where data quality is low, financial institutions can design approaches to improve it over time.

For measuring financed emissions in each asset class, various data inputs are needed to calculate the financial institution's attribution factor and the borrower's or investee's total emissions. The data needed to calculate an attribution factor can typically come from the financial institution itself and its borrower or investee. However, the data required to calculate the borrower's or investee's emissions might not be readily available and must be sought out by the financial institution. The quality of this data can vary depending on assumptions relating to its assuredness, specificity, and other variables.

High quality data is often not available to the financial institution for all asset classes. In these instances, the institution should use the best available data in accordance with the data hierarchy shown in Figure 4-3. Data quality scorecards specific to each asset class are presented in Chapter 5 and the Annex 10.1.

**Figure 4-3. General data quality scorecard**

PCAF recognizes there is often a lag between financial reporting and required data, such as emissions data for the borrower or investee becoming available. In these instances, financial institutions should use the most recent data available even if it is representative of different years, with the intention of aligning as much as possible. For example, it would be expected and appropriate that a financial institution's reporting in 2020 for its 2019 financial year would use 2019 financial data alongside 2018 (or other most recent) emissions data.

Data quality is specific to each asset class. More information on issues related to data quality and how to employ the hierarchy for each asset class can be found in Chapter 5 and in Annex 10.1.

## Disclosure

The public disclosure of absolute financed emissions is crucial for external stakeholders and financial institutions using the methodology to have an analogous view of the climate impact of financial institutions. To this end, financial institutions shall disclose absolute financed emissions. To support their disclosures, financial institutions shall follow the requirements and recommendations listed in Chapter 6 on how to report information relating to methodology, calculations, timeframes, and data quality (as scored using the hierarchies provided in Chapter 5).



# 5. Methodology to measure financed emissions

Introduction

CHAPTER 1

Understand what GHG accounting is

CHAPTER 2

Identify business goals

CHAPTER 3

Review accounting and reporting principles and rules

CHAPTER 4

Review and apply accounting methodologies for each asset class

CHAPTER 5

Report emissions

CHAPTER 6

This chapter describes the methods to calculate financed emissions for six asset classes.



Each asset class has its own section covering methodological guidance on the following elements: <sup>41</sup>

- Asset class definition
- Emission scopes covered
- Attribution of emissions
- Equations to calculate financed emissions
- Data required
- Other considerations
- Limitations

Guidance for calculating absolute emissions is covered in each asset class method. Guidance for calculating avoided emissions is provided in the project finance method only. Methods for calculating emission removals, including sequestered emissions, were not drafted for this edition of the Standard but will be considered and developed in later editions. <sup>42</sup>

This is an initial list of asset classes covered by PCAF. The initiative, with guidance from PCAF participants and users, intends to both update the methodologies over time and add additional ones. Developing an accurate, comparable, feasible, and broad-based standard covering numerous asset classes will be an iterative process.

## How to choose the right asset class method?

How financed emissions are measured may vary by the type of financing provided to the borrower and investee and what is known about the flow of the money. Financial institutions should use Figure 5-1 and the guidance that follows to select the appropriate asset class method.

<sup>41</sup> These are the minimum elements in each asset class section. Some sections include more information, where relevant and specific to the asset class.

<sup>42</sup> Definitions of absolute emissions, avoided emissions, and emission removals can be found in Chapter 2 and in the glossary (Chapter 7).

Figure 5-1 intends to help financial institutions select the appropriate asset class method for measuring financed emissions. The flowchart should be read from left to right, with each column representing a choice to be made by the financial institution before ultimately determining the appropriate asset class method.

Beginning with the far-left side of the figure, financial institutions should select the type and source of financing provided.<sup>43</sup> The choices are:

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

As described in Chapter 4, “follow the money” is a key tenet for GHG accounting of financial assets. The money should be followed as far as possible to understand and account for the climate impact of lending and investments. The next columns in Figure 5-1 relate to how much is known about how the borrower or investee used the money and the activity for which the financing was used. The “Use of proceeds” column, a term defined by the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, distinguishes between investments and loans with known and unknown use of proceeds. Known use of proceeds relates to investments and loans for specific (corporate or consumer) purposes (i.e., the financial institution knows for what activity the money is used), while unknown use of proceeds refers to investments and loans for general (corporate or consumer) purposes (i.e., the financial institution does not know exactly for what activity the money is used, which holds for general purposes loans). The terms will be used interchangeably in the following subchapters.

For the column labeled “Use of proceeds” the financial institution should select “Known” or “Unknown” depending on whether information is held on how the borrower or investee uses the money provided. If the use of proceeds is “Unknown,” the tile option in the next column, “Activity sector,” will default to “All.” If the use of proceeds is “Known,” the financial institution will be required to select the specific activity sector to which the loan or investment was provided.

Loans and investments can be used to finance different products and activities in various sectors. The specific methodology for calculating financed emissions in these sectors can differ, as described in the methods for commercial real estate (CRE), mortgages, and motor vehicle loans. Financed emissions in all other sectors are treated the same (see “All other” in Figure 5-1). This may change over time if financial institutions solicit PCAF to develop additional accounting rules and guidance for other sectors (e.g., financial products for shipping or aviation).

<sup>43</sup> Equity is defined as ownership in the company or project. Debt is defined as a financing instrument that requires repayment by the borrower.

By following the guidance in Figure 5-1 thus far, financial institutions should know the appropriate asset class method(s) to use to start estimating the financed emissions of their portfolio.

Each asset class method currently only covers financial products that are on the balance sheet of the financial institution at the fiscal year-end. This means that financed emissions from products such as revolving credit facilities, bridge loans, and letters of credit are only considered if there is outstanding finance on the financial institution's balance sheet at financial year-end. In a similar fashion, assets held for short durations and designated as held for sale are, for now, not included in the Standard. PCAF will discuss on how to treat such financing in the future and will provide more guidance in later editions of the Standard.

The Standard only provides guidance on the six asset classes mentioned before. Table 5-1 defines these asset classes, including information on the financial products being covered by the respective asset class and the location in the document where specific guidance can be found.

The Standard does not provide explicit guidance on methods to calculate financed emissions for every financial product including the following: private equity that refers to investment funds, green bonds, sovereign bonds, loans for securitization, exchange traded funds, derivatives (e.g., futures, options, swaps), initial public offering (IPO) underwriting, and more. More detailed guidance on such financial products will be considered and published in later editions of the Standard.



Table 5-1. List of asset classes

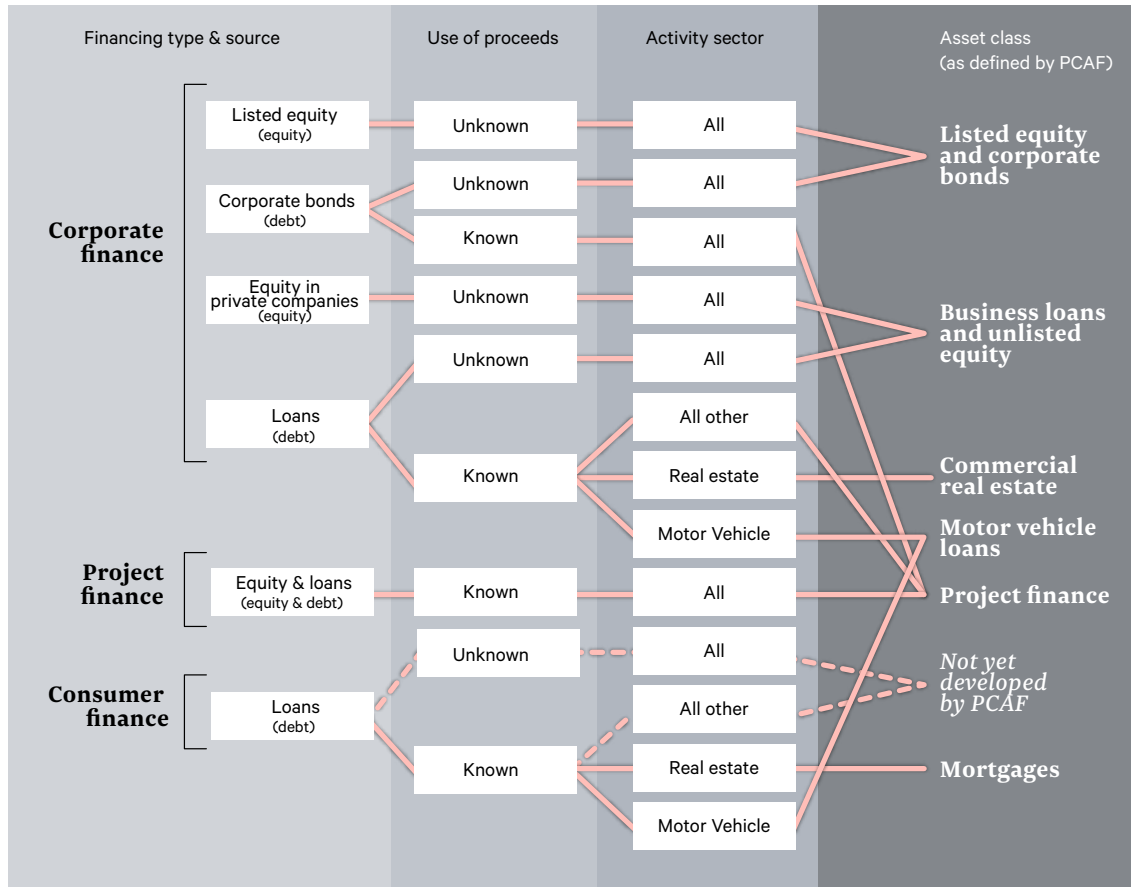
Asset class	Definition	Further guidance
<b>Listed equity and corporate bonds</b>	This asset class includes all listed corporate bonds and all listed equity <sup>44</sup> for general corporate purposes (i.e., unknown use of proceeds as defined by the GHG Protocol) that are traded on a market and are on the balance sheet of the financial institution.	Subchapter 5.1
<b>Business loans and unlisted equity</b>	This asset class comprises business loans and equity investments in private companies, also referred to as unlisted equity. <b>Business loans</b> include all loans and lines of credit for general corporate purposes (i.e., with unknown use of proceeds as defined by the GHG Protocol) to businesses, nonprofits, and any other structure of organization <sup>45</sup> that are not traded on a market and are on the balance sheet of the financial institution. <b>Unlisted equity</b> includes all equity investments for general corporate purposes (i.e., with unknown use of proceeds as defined by the GHG Protocol) to businesses, nonprofits, and any other structure of organization that are not traded on a market and are on the balance sheet of the financial institution.	Subchapter 5.2
<b>Project finance</b>	This asset class includes all loans or equities to projects for specific purposes (i.e., with known use of proceeds as defined by the GHG Protocol) that are on the balance sheet of the financial institution. The financing is designated for a defined activity or set of activities, such as the construction and operation of a gas-fired power plant, a wind or solar project, or energy efficiency projects.	Subchapter 5.3
<b>Commercial real estate</b>	This asset class includes on-balance sheet loans for specific corporate purposes, namely the purchase and refinance of CRE, and on-balance sheet investments in CRE. This definition implies that the property is used for commercial purposes, such as retail, hotels, office space, industrial, or large multifamily rentals. In all cases, the building owner or investor leases the property to tenants to conduct income-generating activities.	Subchapter 5.4
<b>Mortgages</b>	This asset class includes on-balance sheet loans for specific consumer purposes—namely the purchase and refinance of residential property, including individual homes and multi-family housing with a small number of units. This definition implies that the property is used only for residential purposes and not to conduct income-generating activities.	Subchapter 5.5
<b>Motor vehicle loans</b>	This asset class refers to on-balance sheet loans and lines of credit for specific (corporate or consumer) purposes (i.e., with known use of proceeds as defined by the GHG Protocol) to businesses and consumers that are used to finance one or several <sup>46</sup> motor vehicles.	Subchapter 5.6

44 Listed equity refers to equity that is traded on a stock exchange or another securities exchange.

45 This also includes governmental-owned enterprises (e.g., state-owned companies such as municipal energy or public transport providers), while loans to governments themselves are excluded. Loans to governments will be covered in a later edition of the Standard.

46 A single loan might cover the purchase of several vehicles or fleets. In any case, the methodology presented in this chapter should be used.

**Figure 5-1. Guidance for choosing an approach to calculate financed emissions**



# 5.1 Listed equity and corporate bonds



## Asset class definition

This asset class includes all listed corporate bonds and all listed equity<sup>47</sup> for general corporate purposes (i.e., unknown use of proceeds as defined by the GHG Protocol) that are traded on a market and are on the balance sheet of the financial institution.

These include:

- All types of corporate bonds for general corporate purposes
- Common stock
- Preferred stock

For indirect investments (e.g., investments in funds) that incorporate listed equity and bonds, the methodological approach is the same provided the information on the individual holdings is available.

Green bonds, sovereign bonds, and derivative financial products (e.g., futures, options, swaps) are not covered by this asset class. The same holds for short and long positions or special cases of underwriting such as IPO underwriting. Guidance on such financial products are still under development and will be published in later editions of the Standard.

Equity investments in private companies are not covered by this asset class because that is finance not traded on a market. For more information on equity investments in private companies, please refer to the business loans and unlisted equity asset class.

## Emission scopes covered

Financial institutions **shall report borrowers' and investees' absolute scope 1 and scope 2 emissions** across all sectors.

For reporting borrowers' and investees' scope 3 emissions, PCAF follows a phased-in approach, which requires scope 3 reporting for lending to and making investments in companies depending on the sector in which they are active (i.e., where they earn revenues). For sectors where scope 3 emissions reporting is required, the financial institutions **shall separately disclose these absolute scope 3 emissions**, including the specific sectors covered. Separate reporting allows for full transparency, while acknowledging potential double counting issues when adding these to the borrowers' and investees' scope 1 and 2 emissions.

PCAF acknowledges that, to date, the comparability, coverage, transparency, and reliability of scope 3 data still varies greatly per sector and data source. By requiring scope 3 reporting for selected sectors over time, PCAF seeks to make scope 3 emissions reporting more common by improving data availability and quality over time.

Financial institutions **shall** explain if they are not able to report the required scope 3 emissions because of data availability or uncertainty. For all sectors where PCAF does not yet require scope

<sup>47</sup> Listed equity refers to equity that is traded on a stock exchange or another securities exchange.



3 emissions reporting, financial institutions should follow the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard and only account for scope 3 emissions where relevant.

PCAF provides a sector list detailing where scope 3 emissions of borrowers and investees are required to be reported (see Table 5-2). The sector list of PCAF aligns with the phased-in approach for scope 3 emissions as defined by the EU TEG, which was included in Article 5 of the Supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council as regards minimum standards for EU Climate Transition Benchmarks and EU Paris-aligned Benchmarks.

In practice, this means that financial institutions shall start including scope 3 emissions for the oil, gas, and mining sectors from 2021 onward and additional sectors will be added from 2024. In the years toward 2024, PCAF will monitor the data availability and impact for these additional sectors and will provide additional guidance on the reporting requirements.

**Table 5-2. List of sectors with required scope 3 emissions inclusion  
as defined by the EU TEG<sup>48</sup>**

Phase in period	NACE Level 2 (L2) sectors considered
<b>From 2021</b>	At least energy (oil & gas) and mining (i.e., NACE L2: 05-09, 19, 20)
<b>From 2024</b>	At least transportation, construction, buildings, materials, and industrial activities (i.e., NACE L2: 10-18, 21-33, 41-43, 49-53, 81)
<b>From 2026</b>	Every sector

## Attribution of emissions

As a basic attribution principle, the financial institution accounts for a portion of the annual emissions of the financed company determined by the ratio between the institution's outstanding amount (numerator) and the value of the financed company (denominator). This ratio is called the attribution factor.<sup>49</sup>

1. **Outstanding amount (numerator):** This is the actual outstanding amount in listed equity or corporate bonds. It should be defined in line with the denominator. Therefore, the value of outstanding listed equity is defined based on its market value (i.e., market price times number of shares), and the value of outstanding corporate bonds is defined based on the book value of the debt that the borrower owes to the lender. Financial institutions should either use the calendar or financial year-end outstanding amount, provided the approach is communicated clearly and used consistently.

<sup>48</sup> NACE is the abbreviation for the Statistical Classification of Economic Activities in the European Community. The NACE sector codes provided in the table are identical to the codes of the International Standard Industrial Classification of All Economic Activities (ISIC) of the UN (see ISIC REV. 4). Non-European financial institutions are referred to the ISIC classification if this classification better serves their needs.

<sup>49</sup> The attribution factor calculation is, in principle, only possible for listed equity and corporate bonds where investee-specific financial data 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. This is explained in more detail in the Equations to calculate financed emissions and Data required sections below (see Option 3b and Option 3c).

2. **Company value (denominator):** For all listed companies, this is the enterprise value including cash (EVIC) of the respective company. Only for traded bonds to private companies, this is the sum of total company equity<sup>50</sup> and debt,<sup>51</sup> which can be found on the client's balance sheet, as no market value for equity is available.<sup>52</sup>

**For listed companies:**

$$\text{Attribution factor}_c = \frac{\text{Outstanding amount}_c}{\text{Enterprise Value Including Cash}_c}$$

**For bonds to private companies:**

$$\text{Attribution factor}_c = \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c}$$

(with  $c$  = borrower or investee company)

**EVIC is defined as:** The sum of the market capitalization of ordinary shares at fiscal year-end, the market capitalization of preferred shares at fiscal year-end, and the book values of total debt<sup>53</sup> and minorities' interests. No deductions of cash or cash equivalents are made to avoid the possibility of negative enterprise values.<sup>54</sup>

PCAF chose to align the definition of EVIC with the definition provided by the:

1. EU TEG in its Handbook of Climate Transition Benchmarks, Paris-Aligned Benchmark and Benchmarks' ESG Disclosure<sup>55</sup>

50 In cases where the total company equity value according to the client's balance sheet is negative (this can happen when the retained earnings are negative while at the same time being higher than the other equity components on the balance sheet of the client—e.g., this often holds for startups that have high negative profits during their first years of operation), the financial institution shall set total equity to 0; this means that all emissions are attributed to debt only, while no emissions are attributed to equity investments. For those companies that are doing well (i.e., they have high retained earnings), financial institutions attribute more emissions to equity providers; for those companies doing poorly (i.e., they have high retained losses), financial institutions attribute more emissions to debt providers. This is in line with the attribution factor rationale for listed companies, where the equity part of EVIC (i.e., market capitalization) also implicitly reflects retained earnings and losses (e.g., if retained earnings increase, the share price and market capitalization generally also increase).

51 Total debt includes both current and long-term debt on the balance sheet.

52 If total debt or total equity cannot be obtained from a client's balance sheet for whatever reason (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).

53 In its EVIC definition, the EU TEG refers to "the book values of **total debt**," including all debt as listed on the company balance sheet. This is different from some accounting definitions of book value of debt, which exclude some elements like non-interest-bearing debt (also see next footnote on precautionary principle).

54 This is the standard definition of EVIC as provided by the EU TEG. For consistency reasons, PCAF decided to align with this definition to ensure maximum alignment on metrics in the market, which also enables data providers to collect data in a consistent way. In reality, specific elements of EVIC might not be readily available because data providers are still working on aligning their data with this definition. For cases where data is missing, the EU TEG (pg. 16 in its handbook of climate-related benchmarks) recommends conducting corporate GHG data estimations based on the UN's (1992) precautionary principle: "If in doubt, err on the side of the planet not the side of the company." Following this precautionary approach for EVIC calculations, financial institutions can decide to exclude elements of the EVIC (e.g., minority interests or certain elements of the book value of debt) as this would lead to a slightly lower EVIC and higher attribution of financed emissions to their own outstanding amount. These slight deviations from the standard EVIC definition are allowed as long as they are: (1) in line with this precautionary principle, and (2) the basis of the EVIC definition still includes the market value of equity (market capitalization) plus the total book value of debt of any given company.

55 (EU Technical Expert Group on Sustainable Finance, 2019)

2. Supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council as regards minimum standards for EU Climate Transition Benchmarks and EU Paris-aligned Benchmarks, which says EVIC should be used to determine the GHG intensities for the benchmarks.

Box 5 further clarifies the rationale for using EVIC in the attribution factor of listed equity and corporate bonds.

#### Box 5. Rationale for EVIC as denominator in the attribution factor

As described in subchapter 4.2 of the Standard, PCAF applies the same general attribution principles across all asset classes even though the actual equations and underlying (financial) data sources might differ per asset class. This 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. Applying this principle means that, for the attribution of listed companies, a metric needed to be defined that includes both the equity and debt of a listed company.

EVIC was selected as the attribution metric for listed equity and corporate bonds because it:

- Includes both equity and debt in line with PCAF attribution principles and other asset classes, ensuring alignment with similar asset classes (e.g., business loans).
- Is a common metric in the financial sector of a company's total value and is expected to gain more dominance because of its adoption by the EU TEG and the benchmark regulation.
- Is based on company data (market value of equity and total book value of debt), which is generally available to financial institutions and data providers. The availability of this data is expected to be further improved due to the EU benchmark regulation, which will stimulate all data providers to collect EVIC data.
- Includes market valuation of equity, which is the most common approach in the financial sector to determine company ownership.
- Avoids issues with negative enterprise values due to the inclusion of cash (not deducting cash as in the regular enterprise value definition) as well as issues with attributing more than 100% of a company's emissions to financial institutions.

The simplified example below highlights how EVIC ensures 100% attribution of company emissions by not deducting cash.

#### Example Company: 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%

## Exceptions

If a financial institution only invests in equity and undertakes GHG accounting from a risk perspective, emissions could also be attributed to the total market capitalization (market value of a company's outstanding shares) of the company. Please note, however, that the Standard is aiming to standardize and harmonize GHG accounting across financial institutions and has a clear preference for using EVIC. To enable a smooth transition from market capitalization to using EVIC, the exception to use total market capitalization will remain possible for a maximum of 3 years (ending in 2023).

## Equations to calculate financed emissions

The financed emissions of investment in a company are calculated by multiplying the attribution factor by the emissions of the respective borrower or investee company. The total financed emissions of a listed equity and corporate bonds portfolio is calculated as follows:<sup>56</sup>

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

(with  $c$  = borrower or investee company)

The attribution factor represents the proportional share of a given company—that is, the ratio of the outstanding amount to EVIC for listed companies and the total equity and debt for bonds to private companies:

### For listed companies:

$$\text{Financed emissions} = \sum_c \frac{\text{Outstanding amount}_c}{\text{Enterprise Value Including Cash}_c} \times \text{Company emissions}_c$$

### For bonds to private companies:

$$\text{Financed emissions} = \sum_c \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c} \times \text{Company emissions}_c$$

The financed emissions from listed equity and corporate bonds can be calculated in different ways depending on the availability of borrower- and investee-specific financial and emissions data. Overall, PCAF distinguishes three different options to calculate the financed emissions from listed equity and bonds depending on the emissions data used:

<sup>56</sup> Wherein a financial institution is lending to or investing in a subsidiary of a larger entity, the attribution should be accounted at the subsidiary level according to the “follow the money” principle, if the financial institution has balance sheet information on the subsidiary. If the subsidiary’s balance sheet is unavailable, the financial institution should calculate the attribution factor based on the total balance sheet of the entity to whom the financial institution has recourse for repayment of the loan.

- **Option 1: reported emissions**, where verified<sup>57</sup> or unverified<sup>58</sup> emissions are collected from the borrower or investee company directly (e.g., 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 (e.g., megawatt-hours of natural gas consumed or tons of steel produced) and then allocated to the reporting financial institution using the attribution factor. The emissions data should be estimated using an appropriate calculation methodology or tool with verified emission factors expressed per physical activity (e.g., tCO<sub>2</sub>e/MWh or tCO<sub>2</sub>e/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 (e.g., euro of revenue or euro of asset) 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., tCO<sub>2</sub>e/€ of revenue or tCO<sub>2</sub>e/€ of asset).<sup>59</sup>

## Data required

PCAF distinguishes three options to calculate the financed emissions from listed equity and corporate bonds depending on the emissions data used:

- Option 1: reported emissions
- Option 2: physical activity-based emissions
- Option 3: economic activity-based emissions

While Options 1 and 2 are based on company-specific reported emissions or primary physical activity data provided by the borrower or investee or third-party data providers, Option 3 is based on region- or sector-specific average emissions or financial data using public data sources such as statistics or data from other third-party providers.<sup>60</sup>

Options 1 and 2 are preferred over Option 3 from a data quality perspective—they provide more accurate emissions results to a financial institution. Due to data limitations, financial institutions might use Options 1 or 2 for certain companies and Option 3 for others. The data quality mix shall be reflected in the average data quality score, as Chapter 6 illustrates.

<sup>57</sup> This refers to reported emissions being calculated in line with the GHG Protocol and verified by a third-party auditor.

<sup>58</sup> This refers to reported emissions being calculated in line with the GHG Protocol without verification by a third-party auditor. Unverified reported emissions can be calculated by either an external party or by the borrower or investee company itself.

<sup>59</sup> Sampling tests based on actual data on the company level extrapolated to the portfolio level can help to test the accuracy of calculations based on this data from statistics or EEIO tables. This may also be used to refine the data for specific sectors or regions if the reporting financial institution has a strong presence in and specific knowledge of the respective sector or region. National agencies and regional data providers or statistical offices in individual regions may assist reporting financial institutions and investee companies in various regions in finding regional and more relevant financial or emissions data information.

<sup>60</sup> Option 1 and Option 2 were called “Approach 1: company specific approach” and Option 3 was called “Approach 2: Sector/region average approximation” in the report produced by the PCAF Dutch team: (PCAF, 2019).

Table 5-3 provides data quality scores for each of the described options and sub-options (if applicable) that can be used to calculate the financed emissions for listed equity and corporate bonds.

**Table 5-3. General description of the data quality score table for listed equity and corporate bonds<sup>61</sup>**

(score 1 = highest data quality; score 5 = lowest data quality)

Data Quality	Options to estimate the financed emissions		When to use each option
<b>Score 1</b>	<b>Option 1: Reported emissions</b>	<b>1a</b>	Outstanding amount in the company and EVIC are known. <b>Verified emissions</b> of the company are available.
		<b>1b</b>	Outstanding amount in the company and EVIC are known. <b>Unverified emissions</b> calculated by the company are available.
<b>Score 2</b>	<b>Option 2: Physical activity-based emissions</b>	<b>2a<sup>62</sup></b>	Outstanding amount in the company and EVIC are known. Reported company emissions are not known. Emissions are calculated using primary physical activity data of the <b>company's energy consumption</b> and emission factors <sup>63</sup> specific to that primary data. Relevant process emissions are added.
<b>Score 3</b>		<b>2b</b>	Outstanding amount in the company and EVIC are known. Reported company emissions are not known. Emissions are calculated using primary physical activity data of the <b>company's production</b> and emission factors specific to that primary data.
<b>Score 4</b>	<b>Option 3: Economic activity-based emissions</b>	<b>3a</b>	Outstanding amount in the company, EVIC, and the <b>company's revenue<sup>64</sup></b> are known. Emission factors for the sector per unit of revenue are known (e.g., tCO <sub>2</sub> e per euro of revenue earned in a sector).
		<b>3b</b>	Outstanding amount in the company is known. Emission factors for the sector per unit of asset (e.g., tCO <sub>2</sub> e per euro of asset in a sector) are known.
<b>Score 5</b>		<b>3c</b>	Outstanding amount in the company is known. Emission factors for the sector per unit of revenue (e.g., tCO <sub>2</sub> e per euro of revenue earned in a sector) and <b>asset turnover ratios</b> for the sector are known.

A detailed summary of the data quality score table, including data needs and equations to calculate financed emissions, is provided in Annex 10.1 (Table 10-1). Data for all three options in Table 5-3 can be derived from different data sources.

61 For bonds to private companies, EVIC is defined as the total equity and debt of the respective company.

62 The quality scoring for the Option 2a is only possible for/applicable to scope 1 and scope 2 emissions as scope 3 emissions cannot be estimated by this option. Other options can be used to estimate the scope 3 emissions, however.

63 Supplier-specific emission factors (e.g., from electricity provider) for the respective primary activity data are always preferred over non-supplier-specific emission factors.

64 If revenue is not deemed a suitable financial indicator for estimating the emissions of a company in a certain sector, one can apply other suitable financial indicators as a proxy. If an alternative indicator is used, the reasoning for the selection of this alternative indicator should be made transparent. The data quality score will not be affected.

**Official company filings**

Where available, PCAF recommends using emissions data reported by companies, given the data fully covers a company's emissions-generating activities disclosed in official filings and environmental reports. The most recent available data should be used with mention to the data source, reporting period, or publication date. Using this data is in line with Option 1.

**Data providers (Option 1)**

For Option 1 (reported emissions), PCAF recommends either collecting emissions from the borrower or investee company directly (e.g., company sustainability report) or third-party data providers, such as CDP, Bloomberg, MSCI, Sustainalytics, S&P/Trucost, and ISS ESG. Data providers typically make scope 1 and 2 emissions data available. PCAF encourages using the most recent available data and to mention the data source, reporting period, or publication date.

Data providers collect emissions data as reported by the companies themselves, either through a standardized framework such as CDP or through a company's own disclosures in official filings and environmental reports. They often have their own methodologies to estimate/calculate companies' emissions, especially if this data is not reported. In this case, the calculation would be in line with Options 2 or 3, assuming the methodology used is in line with the GHG Protocol. Financial institutions should ask data providers to be transparent, disclose the calculation method they use, and confirm alignment with the GHG Protocol. This will enable financial institutions to apply the proper score to the data. PCAF also encourages data providers to apply the PCAF scoring method to their own data, which would allow them to share the data quality scores directly with their clients.

PCAF does not recommend a preferred data vendor. PCAF recommends using data providers that use the standardized CDP framework and suggests data providers disclose the data quality score according to the scoring hierarchy in Table 5-3.<sup>65</sup> When using data providers, PCAF recommends using the same provider for all equity and bonds due to variability of scope 1 and 2 emissions observed by providers.

**Estimation models (Option 2 and 3)**

Not all companies disclose their emissions data in official filings or through data providers. Reporting in emerging markets lags developed markets. To maximize the coverage of emissions data, the remaining gaps are often filled with estimates.

If no data is available, estimation models consistent with the emissions from the primary business activity may be used. Emission factors from production-based models (i.e., emission intensity per physical activity) are preferred over emission factors from revenue-based models (i.e., emission intensity per revenue) because the former are less sensitive to exchange rate or commodity price fluctuations. Emission factors from production-based models in line with Option 2 are especially useful for carbon-intensive industries like utilities, materials, energy, and industrials. Emission factors from revenue-based models in line with Option 3 (e.g., intensity-based or environmental input-output models) have the advantage of requiring less detailed data from the financial institution.

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65 More information about CDP can be found at: <https://www.cdp.net/en>

For Option 2 (physical activity-based emissions), PCAF recommends using actual energy consumption (e.g., megawatt-hours of natural gas consumed) or production (e.g., tons of steel produced) data reported by companies, given the data fully covers the company's emissions-generating activities. The emission factors expressed per physical activity used should be based on appropriate and verified calculation methodologies or tools issued or approved by a credible independent institution. Example data sources for retrieving emission factors are ecoinvent,<sup>66</sup> Defra,<sup>67</sup> Intergovernmental Panel on Climate Change (IPCC),<sup>68</sup> GEMIS (Global Emissions Model for integrated Systems),<sup>69</sup> and Food and Agriculture Organization of the United Nations (FAO).<sup>70</sup> The most recent available data should be used, including a mention of the data source, reporting period, or publication date.

For Option 3 (economic activity-based emissions), PCAF recommends using official statistical data or acknowledged EEIO tables providing region- or sector-specific average emission factors expressed per economic activity (e.g., tCO<sub>2</sub>e/€ of revenue or tCO<sub>2</sub>e/€ of asset). Financial institutions should use emission factors as consistently as possible with the primary business activity. For example, for a business loan to a paddy rice farmer, the financial institution should seek to find and use a sector-specific average emission factor for the paddy rice sector and not an emission factor for the agricultural sector in general. Example EEIO databases that can be used to obtain such emission factors are EXIOBASE,<sup>71</sup> Global Trade Analysis Project (GTAP),<sup>72</sup> or World Input-Output Database (WIOD).<sup>73</sup>

PCAF's web-based emission factor database provides a large set of emission factors for Options 2 and 3. The database can help financial institutions get started with estimating the financed emissions of their investments.

PCAF expects that the financed emissions for most listed equity and corporate bonds can be derived through either reported emissions (Option 1), physical activity data (Option 2), or economic activity data (Option 3). However, PCAF allows the use of alternative options to calculate emissions if none of the specified options can be used or in the case that new options are developed. The reporting financial institution shall always explain the reasons for using an alternative option if it deviates from the three options defined above.

66 More information can be found at: <https://www.ecoinvent.org/>

67 More information can be found at: <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conedition-factors-2019>

68 More information can be found at: [https://www.ipcc-nggip.iges.or.jp/EFDB/find\\_ef.php](https://www.ipcc-nggip.iges.or.jp/EFDB/find_ef.php)

69 More information can be found at: <http://iinas.org/gemis-download.html>

70 More information can be found at: <http://www.fao.org/partnerships/leap/database/ghg-crops/en>

71 More information can be found at: <https://www.exiobase.eu>

72 More information can be found at: <https://www.gtap.agecon.purdue.edu>

73 More information can be found at: <http://www.wiod.org>



## Limitations

### Market price fluctuations

When using EVIC as the denominator, assets under management change as a result of fluctuating market prices. Under the influence of this fluctuation, an objective to reduce relative financed emissions (also referred to as emission intensities) by a certain percentage becomes a moving target. Using normalized assets under management may help overcome this, as prices are held constant over the target period. For example, the EU TEG and EU regulation on benchmarks require the application of an inflation correction to changes in EVIC over time.

Applying corrections for market price fluctuations can highly influence the results and heavily reduce the comparability of results between different financial institutions when applied inconsistently. In addition, corrections could theoretically be applied to many other variables (like exchange rates, inflation, emerging versus emerging markets, etc.), further reducing comparability. For that reason, PCAF requires all financial institutions to report its uncorrected absolute emissions as a minimum. Corrected results may optionally be reported separately. If the financial institution decides to apply such adjustments, they should be made transparent. In the future, PCAF will also investigate the challenges linked to steering on financed emissions and describe the metrics in use by investors as emerging practices.

### Organization identifiers

For larger listed equity and corporate bond portfolios, organization identifiers should be in place to combine information from various sources. Examples of such identifiers include the Stock Exchange Daily Official List, International Securities Identification Number, Committee on Uniform Security Identification Procedures numbers, and Bloomberg tickers. For large portfolios, matching external data sources can be a challenge when two companies merge; the organization identifiers will be adjusted immediately while carbon data providers might only update such information on an annual basis.

### Side effects

There is a potentially undesired side effect related to attributing the issuer's absolute emissions to its total equity and debt position. While lower emissions would typically be achieved by encouraging issuers to reduce their absolute emissions (numerator), the recommended calculation methods imply that a similar effect could be achieved by increasing the denominator (either the issuer's equity or debt position).

# 5.2 Business loans and unlisted equity

Introduction

CHAPTER 1

Understand what GHG accounting is

CHAPTER 2

Identify business goals

CHAPTER 3

Review accounting and reporting principles and rules

CHAPTER 4

Review and apply accounting methodologies for each asset class

CHAPTER 5

Report emissions

CHAPTER 6

## Asset class definition

This PCAF asset class comprises:

- Business loans
- Equity investments in private companies, also referred to as unlisted equity

### Business loans

Business loans include all loans and lines of credit for general corporate purposes (i.e., with unknown use of proceeds as defined by the GHG Protocol) to businesses, nonprofits, and any other structure of organization<sup>74</sup> that are not traded on a market and are on the balance sheet of the financial institution.<sup>75</sup> Revolving credit facilities, overdraft facilities, and business loans secured by real estate such as CRE-secured lines of credit are also included. Any off-balance sheet loans and lines of credit are excluded.

For financing products such as revolving credit facilities, bridge loans, and letters of credit, which are commonly provided by financial institutions, only those loans outstanding on the year-end balance sheet of the financial institution are covered by this asset class.<sup>76</sup>

Methods for financed emissions from business loans for specific corporate purposes (i.e., with known use of proceeds) are not included in this asset class but are instead covered by the project finance asset class, even if they may not be structured as project finance per se (see subchapter 5.3). Business loans to finance commercial real estate or motor vehicles are also considered separate asset classes—i.e., CRE (see subchapter 5.4) and motor vehicle loans (see subchapter 5.6), respectively.<sup>77</sup>

### Unlisted equity

Unlisted equity includes all equity investments for general corporate purposes (i.e., with unknown use of proceeds as defined by the GHG Protocol) to businesses, nonprofits, and any other structure of organization that are not traded on a market and are on the balance sheet of the financial institution. Unlisted equity is also referred to as equity investments in private companies (i.e., the financial institute obtains shares of the company) throughout the Standard.

Private equity that refers to investment funds is not included in this asset class; guidance on such private equity will follow in later editions of the Standard.

74 This also includes governmental-owned enterprises (e.g., state-owned companies such as municipal energy or public transport providers), while loans to governments themselves are excluded. Loans to governments (i.e., governmental lending) will be covered in a later edition of the Standard.

75 The term “company” is used throughout this subchapter but can refer to any type of organization, including nonprofits.

76 More detailed guidance on such financing is under development and will be published in later editions of the Standard; this guidance will elaborate further on how to account for the significant interannual fluctuations of such financial products that may not be captured appropriately when only considering the year-end balance sheet of a financial institution. For now, financial institutions should be transparent on any major last minute increases or decreases at fiscal year-end because this can increase or decrease the financed emissions from business loans significantly.

77 Financial institutions can still report their financed emissions from such business loans for specific corporate purposes (i.e., with known use of proceeds) under an asset class called “business loans” if that is the name commonly used or preferred by the financial institution (e.g., when reporting internally or externally).

## Emission scopes covered

Financial institutions **shall report borrowers' and investees' absolute scope 1 and scope 2 emissions** across all sectors.

For reporting borrowers' and investees' scope 3 emissions, PCAF follows a phased-in approach, which requires scope 3 reporting for lending to and making investments in companies depending on the sector in which they are active (i.e., where they earn revenues). For sectors where scope 3 emissions reporting is required, the financial institutions **shall separately disclose these absolute scope 3 emissions**, including the specific sectors covered. Separate reporting allows for full transparency while acknowledging potential double counting issues when adding these to the borrowers' and investees' scope 1 and 2 emissions.

PCAF acknowledges that, to date, the comparability, coverage, transparency, and reliability of scope 3 data still varies greatly per sector and data source. By requiring scope 3 reporting for selected sectors over time, PCAF seeks to make scope 3 emissions reporting more common by improving data availability and quality over time.

Financial institutions **shall** explain if they are not able to report the required scope 3 emissions because of data availability or uncertainty. For all sectors where PCAF does not yet require scope 3 emissions reporting, financial institutions should follow the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard and only account for scope 3 emissions where relevant.

PCAF provides a sector list detailing where scope 3 emissions of borrowers and investees are required to be reported (see Table 5-4). The sector list of PCAF aligns with the phased-in approach for scope 3 emissions as defined by the EU TEG, which was included in Article 5 of the *Supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council as regards minimum standards for EU Climate Transition Benchmarks and EU Paris-aligned Benchmarks*.

In practice, this means that financial institutions **shall start including scope 3 emissions for the oil, gas, and mining sectors from 2021** onward and additional sectors will be added from 2024. In the years toward 2024, PCAF will monitor the data availability and impact for these additional sectors and will provide additional guidance on the reporting requirements.

**Table 5-4. List of sectors with required scope 3 emissions inclusion  
as defined by the EU TEG<sup>78</sup>**

Phase in period	NACE L2 sectors considered
<b>From 2021</b>	At least energy (oil & gas) and mining (i.e., NACE L2: 05-09, 19, 20)
<b>From 2024</b>	At least transportation, construction, buildings, materials, and industrial activities (i.e., NACE L2: 10-18, 21-33, 41-43, 49-53, 81)
<b>From 2026</b>	Every sector

<sup>78</sup> NACE is the abbreviation for the Statistical Classification of Economic Activities in the European Community. The NACE sector codes provided in the table are identical to the codes of the ISIC of the UN (see ISIC REV. 4). Non-European financial institutions are referred to the ISIC classification if this classification better serves their needs.



## Attribution of emissions

As a basic attribution principle, the financial institution accounts for a portion of the borrower's and investee's annual emissions, as determined by the ratio between the outstanding amount (numerator) and the value of the financed company (denominator). This ratio is called the attribution factor.<sup>79</sup>

1. **Outstanding amount (numerator):** This is the actual outstanding loan amount.
  - a For business loans, this is defined as the value of the debt that the borrower owes to the lender (i.e., disbursed debt minus any repayments). It will be adjusted annually to reflect the correct exposure, resulting in the attribution to decline to 0 at the end of the lifetime of the loan (i.e., when it is fully repaid).
  - b For unlisted equity (i.e., equity investments in private companies), the outstanding amount is the outstanding value of equity that the financial institution holds in the private company. It is calculated by multiplying the relative share of the financial institution in the respective investee<sup>80</sup> by the total equity of the respective investee according to its balance sheet. Financial institutions should either use the calendar or financial year-end outstanding amount, provided the approach is communicated and used consistently.
2. **Company value (denominator):**
  - a. For business loans and equity investments to/in private companies, this is the sum of total company equity<sup>81</sup> and debt,<sup>82</sup> which can be found on the client's balance sheet.
  - b. For business loans to listed companies, this is the company enterprise value including cash (EVIC) of the respective client.<sup>83</sup>

<sup>79</sup> The attribution factor calculation is, in principle, only possible for business loans and unlisted equity where client-specific financial data is available. For business loans and unlisted equity 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 actual outstanding amount. This is explained in more detail in the Equations to calculate financed emissions and Data required sections below (see Option 3b and Option 3c).

<sup>80</sup> The relative share of the financial institution in the respective investee is calculated by dividing the number of shares that the financial institution holds in the respective investee by the total number of shares of the investee.

<sup>81</sup> In cases where the total company equity value according to the client's balance sheet is negative (this can happen when the retained earnings are negative while at the same time being higher than the other equity components on the balance sheet of the client—e.g., this often holds for startups that have high negative profits during their first years of operation), the financial institution shall set total equity to 0; this means that all emissions are attributed to debt only, while no emissions are attributed to equity investments. For those companies that are doing well (i.e., they have high retained earnings), financial institutions attribute more emissions to equity providers; for those companies doing poorly (i.e., they have high retained losses), financial institutions attribute more emissions to debt providers. This is in line with the attribution factor rationale for listed companies, where the equity part of EVIC (i.e., market capitalization) also implicitly reflects retained earnings and losses (e.g., if retained earnings increase, the share price and thus the market capitalization generally also increase).

<sup>82</sup> Total debt includes both current and long-term debt on the balance sheet.

<sup>83</sup> If total debt or total equity cannot be obtained from a client's balance sheet for whatever reason (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).

**For business loans and equity investments to/in private companies:**

$$\text{Attribution factor}_c = \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c}$$

For unlisted equity, the outstanding amount is calculated as follows:

$$\frac{\# \text{ shares of financial institute}_c}{\# \text{ total shares}_c} \times \text{total equity}_c$$

**For business loans to listed companies:**

$$\text{Attribution factor}_c = \frac{\text{Outstanding amount}_c}{\text{Enterprise Value Including Cash}_c}$$

(with  $c$  = borrower or investee company)

**EVIC is defined as:** The sum of the market capitalization of ordinary shares at fiscal year-end, the market capitalization of preferred shares at fiscal year-end, and the book values of total debt<sup>84</sup> and minorities' interests. No deductions of cash or cash equivalents are made to avoid the possibility of negative enterprise values.<sup>85</sup>

PCAF chose to align the definition of EVIC with the definition provided by the :

1. EU TEG in its *Handbook of Climate Transition Benchmarks, Paris-Aligned Benchmark and Benchmarks' ESG Disclosure*<sup>86</sup>
2. The *Supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council as regards minimum standards for EU Climate Transition Benchmarks and EU Paris-aligned Benchmarks*, which says EVIC should be used to determine the GHG intensities for the benchmarks.

Further clarification on the rationale for using EVIC for the attribution of listed companies is provided in the asset class on listed equity and corporate bonds.

84 In its EVIC definition, the EU TEG refers to "the book values of total debt," including all debt as listed on the company balance sheet. This is different from some accounting definitions of book value of debt, which exclude some elements like non-interest-bearing debt (also see next footnote on precautionary principle).

85 This is the standard definition of EVIC as provided by the EU TEG. For consistency reasons, PCAF decided to align with this definition to ensure maximum alignment on metrics in the market, which also enables data providers to collect data in a consistent way. In reality, specific elements of EVIC might not be readily available because data providers are still working on aligning their data with this definition. For cases where data is missing, the EU TEG (pg. 16 in its handbook of climate-related benchmarks) recommends conducting corporate GHG data estimations based on the UN's (1992) precautionary principle: "If in doubt, err on the side of the planet not the side of the company." Following this precautionary approach for EVIC calculations, financial institutions can decide to exclude elements of the EVIC (e.g., minority interests or certain elements of the book value of debt) as this would lead to a slightly lower EVIC and higher attribution of financed emissions to their own outstanding amount. These slight deviations from the standard EVIC definition are allowed as long as they are: (1) in line with this precautionary principle, and (2) the basis of the EVIC definition still includes the market value of equity (market capitalization) plus the total book value of debt of any given company.

86 (EU Technical Expert Group on Sustainable Finance, 2019)



## Equations to calculate financed emissions

The financed emissions from business loans and unlisted equity are calculated by multiplying the attribution factor by the emissions of the borrower or investee company and then summing these emissions up:<sup>87</sup>

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

(with  $c$  = borrower or investee company)

The attribution factor represents the proportional share of a given company—that is, the ratio of the outstanding amount to total equity and debt for private companies and EVIC for listed companies:

**For business loans and equity investments to/in private companies:**

$$\text{Financed emissions} = \sum_c \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c} \times \text{Company emissions}_c$$

**For business loans to listed companies:**

$$\text{Financed emissions} = \sum_c \frac{\text{Outstanding amount}_c}{\text{Enterprise Value Including Cash}_c} \times \text{Company emissions}_c$$

(with  $c$  = borrower or investee company)

The financed emissions from business loans and unlisted equity can be calculated in different ways depending on the availability of borrower- and investee-specific financial and emissions data. Overall, PCAF distinguishes three different options to calculate the financed emissions from business loans and unlisted equity depending on the emissions data used.

- **Option 1: Reported emissions**, where verified<sup>88</sup> or unverified<sup>89</sup> emissions are collected from the borrower or investee company directly (e.g., company sustainability report) or indirectly via verified third-party data providers (e.g., CDP) and then allocated to the reporting financial institution 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 (e.g., megawatt-hours of natural gas consumed or tons of steel produced) and then allocated to the reporting financial institution using the attribution

<sup>87</sup> Wherein a financial institution is lending to or investing in a subsidiary of a larger entity, the attribution should be accounted at the subsidiary level according to the “follow the money” principle, if the financial institution has balance sheet information on the subsidiary. If the subsidiary balance sheet is unavailable, the financial institution should calculate the attribution factor based on the total balance sheet of the entity to whom the financial institution has recourse for repayment of the loan.

<sup>88</sup> This refers to reported emissions being calculated in line with the GHG Protocol and verified by a third-party auditor.

<sup>89</sup> This refers to reported emissions being calculated in line with the GHG Protocol without verification by a third party-auditor. Unverified reported emissions can be calculated by either an external party or by the borrower or investee company itself.

factor. The emissions data should be estimated using an appropriate calculation methodology or tool with verified emission factors expressed per physical activity (e.g., tCO<sub>2</sub>e/MWh or tCO<sub>2</sub>e/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 (e.g., euro of revenue or euro of asset) and then allocated to the reporting financial institution using the attribution factor. The emissions data should be estimated using official statistical data or acknowledged EEIO tables providing region- or sector-specific average emission factors expressed per economic activity (e.g., tCO<sub>2</sub>e/€ of revenue or tCO<sub>2</sub>e/€ of asset).<sup>90</sup>

## Data required

As described, PCAF distinguishes three options to calculate the financed emissions from business loans and unlisted equity depending on the emissions data used:

- Option 1: reported emissions
- Option 2: physical activity-based emissions
- Option 3: economic activity-based emissions

While Options 1 and 2 are based on company-specific reported emissions or primary physical activity data provided by the borrower or investee company or third-party data providers, Option 3 is based on region- or sector-specific average emissions or financial data using public data sources such as statistics or data from other third-party providers.<sup>91</sup>

Options 1 and 2 are preferred over Option 3 from a data quality perspective—provide more accurate emissions results to a financial institution. Due to data limitations, financial institutions might use Options 1 or 2 for certain companies and Option 3 for others. The data quality mix shall be reflected in the average data quality score, as Chapter 6 illustrates.

<sup>90</sup> Sampling tests based on actual data on the company level extrapolated to the portfolio level can help to test the accuracy of calculations based on this data from statistics or EEIO tables. This may also be used to refine the data for specific sectors or regions if the reporting financial institution has a strong presence in and specific knowledge of the respective sector or region. National agencies and regional data providers or statistical offices in individual regions may assist reporting financial institutions and investee companies in various regions in finding regional and more relevant financial or emissions data information.

<sup>91</sup> Option 1 and Option 2 were called “Approach 1: company specific approach” and Option 3 was called “Approach 2: Sector/region average approximation” in the report produced by the PCAF Dutch team: (PCAF, 2019).

Table 5-5 provides data quality scores for each of the described options and sub-options (if applicable) that can be used to calculate the financed emissions for business loans and unlisted equity.

**Table 5-5. General description of the data quality score table for business loans and unlisted equity<sup>92</sup>**

(score 1 = highest data quality; score 5 = lowest data quality)

Data Quality	Options to estimate the financed emissions		When to use each option
Score 1	Option 1: Reported emissions	1a	Outstanding amount in the company and total company equity plus debt are known. <b>Verified emissions</b> of the company are available.
		1b	Outstanding amount in the company and total company equity plus debt are known. <b>Unverified emissions</b> calculated by the company are available.
Score 2	Option 2: Physical activity-based emissions	2a <sup>93</sup>	Outstanding amount in the company and total company equity plus debt are known. Reported company emissions are not known. Emissions are calculated using primary physical activity data for the company's energy <b>consumption</b> and emission factors <sup>94</sup> specific to that primary data. Relevant process emissions are added.
Score 3		2b	Outstanding amount in the company and total company equity plus debt are known. Reported company emissions are not known. Emissions are calculated using primary physical activity data for the company's <b>production</b> and emission factors specific to that primary data.
Score 4	Option 3: Economic activity-based emissions	3a	Outstanding amount in the company, total company equity plus debt, and the <b>company's revenue</b> <sup>95</sup> are known. Emission factors for the sector per unit of revenue are known (e.g., tCO <sub>2</sub> e per euro of revenue earned in a sector).
		3b	Outstanding amount in the company is known. Emission factors for the sector per unit of asset (e.g., tCO <sub>2</sub> e per euro of asset in a sector) are known.
Score 5		3c	Outstanding amount in the company is known. Emission factors for the sector per unit of revenue (e.g., tCO <sub>2</sub> e per euro of revenue earned in a sector) and <b>asset turnover ratios</b> for the sector are known.

A detailed summary of the data quality score table, including data needs and equations to calculate financed emissions, is provided in Annex 10.1 (Table 10-2). Data for all three options in Table 5-5 can be derived from different data sources.

<sup>92</sup> For business loans to listed companies, total company equity and debt is defined as the EVIC of the respective company.

<sup>93</sup> The quality scoring for Option 2a is only possible for/applicable to scope 1 and scope 2 emissions as scope 3 emissions cannot be estimated by this option. Other options can be used to estimate the scope 3 emissions, however.

<sup>94</sup> Supplier-specific emission factors (e.g., from an electricity provider) for the respective primary activity data are always preferred over non-supplier-specific emission factors.

<sup>95</sup> If revenue is not deemed a suitable financial indicator for estimating the emissions of a company in a certain sector, one can apply other suitable financial indicators as a proxy. If an alternative indicator is used, the reasoning for the selection of this alternative indicator should be made transparent. The data quality score will not be affected.

**Data providers (Option 1)**

For Option 1 (reported emissions), PCAF recommends either collecting emissions from the borrower or investee company directly (e.g., company sustainability report) or third-party data providers, such as CDP, Bloomberg, MSCI, Sustainalytics, S&P/Trucost, and ISS ESG. Data providers typically make scope 1 and 2 emissions data available. PCAF encourages using the most recent available data and to mention the data source, reporting period, or date of publication.

Data providers collect emissions data as reported by the companies themselves, either through a standardized framework such as CDP or through a company's own disclosures in official filings and environmental reports. They often have their own methodologies to estimate/calculate companies' emissions, especially if emissions are not reported. In this case, the calculation would be in line with Options 2 or 3, assuming the methodology used is in line with the GHG Protocol. Financial institutions should ask data providers to be transparent, disclose the calculation method they use, and confirm alignment with the GHG Protocol. This will enable financial institutions to apply the proper score to the data. PCAF also encourages data providers to apply the PCAF scoring method to their own data, which would allow them to share the data quality scores directly with their clients.

PCAF does not recommend a preferred data vendor. PCAF recommends using data providers that use the standardized CDP framework and suggests data providers disclose the data quality score according to the scoring hierarchy in Table 5-5.<sup>96</sup> When using data providers, PCAF recommends using the same provider due to variability of scope 1 and 2 emissions observed by providers.

**Estimation models (Option 2 and 3)**

Not all companies disclose their emissions data in official filings or through data providers. Reporting in emerging markets lags developed markets. To maximize the coverage of emissions data, the remaining gaps are often filled with estimates.

For Option 2 (physical activity-based emissions), PCAF recommends using actual energy consumption (e.g., megawatt-hours of natural gas consumed) or production (e.g., tons of steel produced) data reported by companies, given the data fully covers the company's emissions-generating activities. The emission factors expressed per physical activity used should be based on appropriate and verified calculation methodologies or tools issued or approved by a credible independent institution. Example data sources for retrieving emission factors are ecoinvent,<sup>97</sup> Defra,<sup>98</sup> IPCC,<sup>99</sup> GEMIS,<sup>100</sup> and FAO.<sup>101</sup> The most recent available data should be used, including a mention of the data source, reporting period, or publication date.

For Option 3 (economic activity-based emissions), PCAF recommends using official statistical data or acknowledged EEIO tables providing region- or sector-specific average emission

<sup>96</sup> More information about CDP can be found at: <https://www.cdp.net/en>

<sup>97</sup> More information can be found at: <https://www.ecoinvent.org/>

<sup>98</sup> More information can be found at: <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conedition-factors-2019>

<sup>99</sup> More information can be found at: [https://www.ipcc-nggip.iges.or.jp/EFDB/find\\_ef.php](https://www.ipcc-nggip.iges.or.jp/EFDB/find_ef.php)

<sup>100</sup> More information can be found at: <http://iinas.org/gemis-download.html>

<sup>101</sup> More information can be found at: <http://www.fao.org/partnerships/leap/database/ghg-crops/en>

factors expressed per economic activity (e.g., tCO<sub>2</sub>e/€ of revenue or tCO<sub>2</sub>e/€ of asset). Financial institutions should use emission factors as consistently as possible with the primary business activity.<sup>102</sup> For example, for a business loan to a paddy rice farmer, the financial institution should seek to find and use a sector-specific average emission factor for the paddy rice sector and not an emission factor for the agricultural sector in general. Example EEIO databases that can be used to obtain such emission factors are EXIOBASE,<sup>103</sup> GTAP,<sup>104</sup> or WIOD.<sup>105</sup>

PCAF's web-based emission factor database provides a large set of emission factors for Option 2 and Option 3 above. The database can help financial institutions get started with estimating the financed emissions of their investments.

PCAF expects that the financed emissions for most business loans and unlisted equity can be derived through either reported emissions (Option 1), physical activity data (Option 2), or economic activity data (Option 3). However, PCAF allows the use of alternative options to calculate emissions if none of the specified options can be used or in the case that new options are developed. The reporting financial institution shall always explain the reasons for using an alternative option if it deviates from the three options defined above.

## Limitations

### Generalized nature of Option 3

One limitation of Option 3 is the generalized nature and necessary assumptions made in applying region- or sector-specific average values (both for emissions and financial data). This makes calculations less robust and more uncertain than those based on borrower- or investee-specific data, as the data for this option largely depends on assumptions and approximations derived from region and sector averages. In addition, statistical data or acknowledged EEIO tables for a given region need to be critically mapped to the sector classification used by the reporting financial institution, as the sectors may not map one-to-one and may cause financed emissions to be over or understated in the end.

### Measurement inconsistencies

Inconsistencies can arise from measuring part of the portfolio with borrower- or investee-specific emissions data (which may encompass scopes 1, 2, and 3 emissions) and from measuring the other part with region- or sector-specific average emissions data (which often encompasses only scope 1 and 2 emissions). One mitigating factor is that using borrower- or investee-specific emission data could improve the accuracy of the region- or sector-specific average data if the reporting financial institution had enough borrower- or investee-specific data points relative to the size of the portfolio in a given sector. For example, if a majority of the borrowers in a lender's textile manufacturing loan portfolio provide specific emissions data, these averages could be applied (instead of industrywide sector averages) to the remainder of the borrowers in the sector that did not provide specific emissions data.

<sup>102</sup> For conglomerates, financed emissions from a mix of activities can be estimated if data (e.g., revenue split) is available. If not, the primary revenue-generating activity should be chosen.

<sup>103</sup> More information can be found at: <https://www.exiobase.eu>

<sup>104</sup> More information can be found at: <https://www.gtap.agecon.purdue.edu>

<sup>105</sup> More information can be found at: <http://www.wiod.org>

**Timing of emissions**

Another limitation for the described options stems from the use of year-end outstanding balances. For a portfolio that includes loans and equity investments to businesses in industries with high seasonal variability or temporal volatility, using year-end outstanding balances may not capture the activity occurring during seasons that do not overlap with the end of the year. Similarly, reporting financial institutions using different fiscal calendars may be less comparable with each other. A solution could be that financial institutions opt to conduct GHG accounting using an average monthly balance for the year instead of a year-end balance. However, this would put more burden on the reporting financial institutions. If financial institutions decide to apply such average monthly balances, they should report these results separately and make the method and assumptions transparent.

**Market price fluctuations**

When using EVIC as the denominator for business loans to listed companies, assets under management change as a result of fluctuating market prices. Under the influence of this fluctuation, an objective to reduce relative financed emissions (also referred to as emission intensities) by a certain percentage becomes a moving target. Using normalized assets under management may help overcome this, as prices are held constant over the target period. For example, the EU TEG and EU regulation on benchmarks require the application of an inflation correction to changes in EVIC over time.

Applying corrections for market price fluctuations can highly influence the results and heavily reduce the comparability of results between different financial institutions when applied inconsistently. In addition, corrections could theoretically be applied to many other variables (like exchange rates, inflation, emerging versus emerging markets, etc.), further reducing comparability. For that reason, PCAF requires all financial institutions to report its uncorrected absolute emissions as a minimum. Corrected results may optionally be reported separately. If the financial institution decides to apply such adjustments, they should be made transparent. In the future, PCAF will also investigate the challenges linked to steering on financed emissions and describe the metrics in use by investors as emerging practices.



# 5.3 Project finance

Introduction

CHAPTER 1

Understand what GHG accounting is

CHAPTER 2

Identify business goals

CHAPTER 3

Review accounting and reporting principles and rules

CHAPTER 4

Review and apply accounting methodologies for each asset class

CHAPTER 5

Report emissions

CHAPTER 6

## Asset class definition

This asset class includes all loans or equities to projects for specific purposes (i.e., with known use of proceeds as defined by the GHG Protocol) that are on the balance sheet of the financial institution. The financing is designated for a defined activity or set of activities, such as the construction and operation of a gas-fired power plant, a wind or solar project, or energy efficiency projects. To calculate emissions, only the financed (ring-fenced) activities are included. Emissions and financials related to existing activities outside the financed project but within the financed organization are not considered.

## Emission scopes covered

Financial institutions shall report the absolute scope 1 and 2 emissions of the project. Scope 3 emissions should be covered if relevant.<sup>106</sup> Avoided and removed emissions may be reported if relevant but must be reported separately from absolute emissions.

## Attribution of emissions

As a basic attribution principle, the financial institution accounts for a portion of the annual emissions of the financed project determined by the ratio between the institution's outstanding amount (numerator) and the total equity and debt of the financed project (denominator). This ratio is called the attribution factor.<sup>107</sup>

$$\text{Attribution factor}_p = \frac{\text{Outstanding amount}_p}{\text{Total equity} + \text{debt}_p}$$

*For equity, the outstanding amount is calculated as follows:*

$$\frac{\text{\# shares of financial institute}_p}{\text{\# total shares}_p} \times \text{total equity}_p$$

*(with  $p$  = project)*

The outstanding amount in the numerator is the amount of debt or equity provided by the individual financier. In the case of debt, the outstanding amount is defined as the value of the debt the borrower owes to the lender (i.e., disbursed debt minus any repayments). In the case of equity, the outstanding amount is the outstanding value of equity the financial institution holds in the project. It is calculated by multiplying the relative share of the financial institution in the respective project<sup>108</sup> by the total equity of the respective project according to its balance sheet. Guarantees have no attribution until they are called and turned into a loan. Financial institutions should either use the calendar or financial year-end outstanding amount, provided the approach is communicated and used consistently.

<sup>106</sup> Examples of projects where scope 3 emissions are relevant include but are not limited to nuclear power plants, hydroelectric power plants, infrastructure projects (airports, highways), and oil and gas exploration.

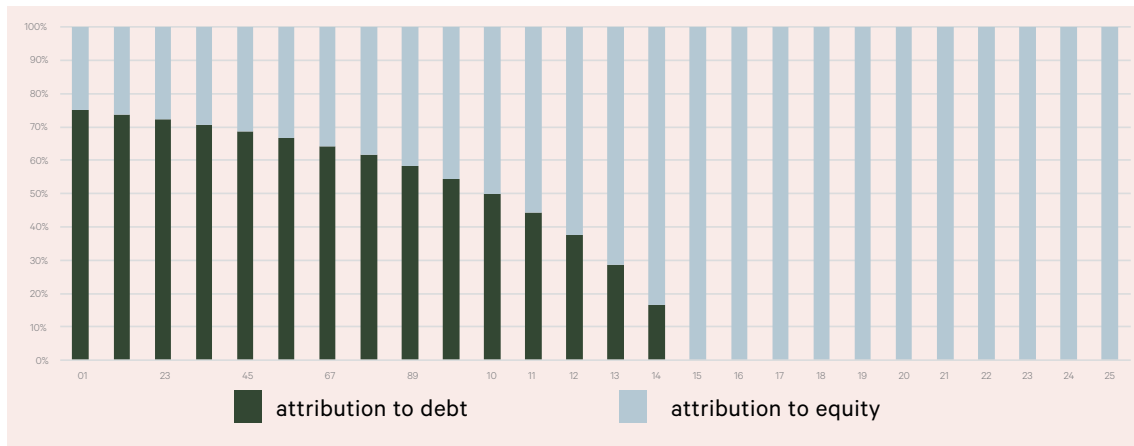
<sup>107</sup> The attribution factor calculation is, in principle, only possible for project finance where project-specific financial data is available. For project finance where such data is unavailable, the attribution factor cannot be calculated but rough estimations on attribution can still be made based on region- and sector-specific average financial data and the outstanding amount. This is explained in more detail in the "Equations to calculate financed emissions" and "Data required" sections below (see Option 3b and Option 3c).

<sup>108</sup> The relative share of the financial institution in the respective project is calculated by dividing the number of shares the financial institution holds in the respective project by the total number of shares of the investee.

At the start of the project, the total equity<sup>109</sup> and debt<sup>110</sup> in the denominator is the total financing available for the project (total debt plus equity to realize the project).<sup>111</sup> In subsequent years, it is expected that projects will report annually on their financials, including balance sheet information (i.e., the total equity and debt within the project). The value of total equity and debt in the denominator can then be used to calculate the attribution factor.

Figure 5-2 illustrates the attribution rule, where initially most of the emissions or avoided emissions from the project are attributed to debt, but as debt is repaid more and more of the emissions become attributable to the equity providers.

**Figure 5-2. Illustration of changes in equity/debt attribution over time**



## Equations to calculate financed emissions

The financed emissions from a single project are calculated by multiplying the attribution factor by the emissions of the respective project. The total financed emissions from multiple projects are calculated using the following equation:

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

(with  $p = \text{project}$ )

In this asset class, the sum represents all projects in a financial institution's portfolio, and the attribution factor represents the proportional share of a given project—that is, the ratio of the outstanding amount to total equity and debt:

<sup>109</sup> In cases where the total project equity value according to the project's balance sheet is negative (this can happen when the retained earnings are negative while at the same time being higher than the other equity components on the balance sheet of the project), the financial institution shall set total equity to 0; this means that all emissions are attributed to debt only, while no emissions are attributed to equity investments. For those projects that are doing well (i.e., they have high retained earnings), financial institutions attribute more emissions to equity providers; for those projects doing poorly (i.e., they have high retained losses), financial institutions attribute more emissions to debt providers. This is in line with the attribution factor rationale for listed companies, where the equity part of EVIC (i.e., market capitalization) also implicitly reflects retained earnings and losses (e.g., if retained earnings increase, the share price and market capitalization generally also increase).

<sup>110</sup> Total debt includes both current and long-term debt on the balance sheet.

<sup>111</sup> If total debt or total equity cannot be obtained from a project's balance sheet for whatever reason (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 project's total assets).

$$\text{Financed emissions} = \sum_p \frac{\text{Outstanding amount}_p}{\text{Total equity} + \text{debt}_p} \times \text{Project emissions}_p$$

(with  $p = \text{project}$ )

Overall, PCAF distinguishes three different options to calculate project emissions depending on the availability of project-specific data:

- **Option 1: reported emissions**, where verified<sup>112</sup> or unverified<sup>113</sup> emissions are collected from the project directly or indirectly through independent third parties.
- **Option 2: physical activity-based emissions**, where emissions are estimated based on primary physical activity data collected from the project (e.g., fuel consumed or megawatt-hours of electricity produced). The emissions data should be estimated using an appropriate calculation methodology or tool with verified emission factors expressed per physical activity (e.g., tCO<sub>2</sub>e/MWh) issued or approved by a credible independent body such as the International Energy Agency (IEA).
- **Option 3: economic activity-based emissions**, where emissions are estimated based on economic activity data collected from the project (e.g., revenue or assets). The emissions data should be estimated using official statistical data or acknowledged EEIO tables providing region- or sector-specific average emission factors expressed per economic activity (e.g., tCO<sub>2</sub>e/€ of revenue or tCO<sub>2</sub>e/€ of asset).<sup>114</sup>

## Data required

Within the due diligence and monitoring of a project finance transaction, the availability and quality of project-specific data is generally good. Project-specific reported emissions (Option 1) ranks highest in quality and consistency but will not always be available. Physical activity-based data (Option 2) such as megawatt-hours produced is generally available from a previous year or as an estimate (e.g., P50 estimations for renewable energy projects).<sup>115</sup> The lowest data quality applies when there is no project-specific physical data, only financial data (Option 3).

The data quality scorecard in Table 5-6 is recommended for project finance. Financial institutions can refine or further specify this generic data quality table per project type, as long as these refined data quality tables are disclosed transparently.

<sup>112</sup> This refers to reported emissions being calculated in line with the GHG Protocol and verified by a third-party auditor.

<sup>113</sup> This refers to reported emissions being calculated in line with the GHG Protocol without verification by a third-party auditor. Unverified reported emissions can be calculated by either an external party or by the borrower or investee itself.

<sup>114</sup> Sampling tests based on actual data on the company level extrapolated to the portfolio level can help to test the accuracy of calculations based on this data from statistics or EEIO tables. This may also be used to refine the data for specific sectors or regions if the reporting financial institution has a strong presence in and specific knowledge of the respective sector or region. National agencies and regional data providers or statistical offices in individual regions may assist reporting financial institutions and borrower or investee companies in various regions in finding regional and more relevant financial or emissions data information.

<sup>115</sup> For renewable energy projects it is customary to have experts calculate percentile production predictions based on an analysis of historic data resource data (wind, irradiation, hydraulic flow, etc.). The P50 value is the predicted annual production for which there is a 50% probability it will be exceeded in a given year. The P90 value is the predicted value that has a 90% probability of being exceeded in a given year (the 1-year P90) or of being exceeded in an average year over a 10-year period (the 10-year P90). PCAF proposes using the P50 predicted production.

**Table 5-6. General description of the data quality score table for project finance**

(score 1 = highest data quality; score 5 = lowest data quality)

Data Quality	Options to estimate the financed emissions		When to use each option
<b>Score 1</b>	<b>Option 1: Reported emissions</b>	<b>1a</b>	Outstanding amount in the project and total project equity plus debt are known. <b>Verified emissions</b> of the project are available.
		<b>1b</b>	Outstanding amount in the project and total project equity plus debt are known. <b>Unverified emissions reported</b> by the project are available.
<b>Score 2</b>	<b>Option 2: Physical activity-based emissions</b>	<b>2a<sup>116</sup></b>	Outstanding amount in the project and total project equity plus debt are known. Project emissions are not known but calculated using primary physical activity data for the project's energy <b>consumption</b> and emission factors <sup>117</sup> specific to that primary data. Relevant process emissions are added.
<b>Score 3</b>		<b>2b</b>	Outstanding amount in the project and total project equity plus debt are known. Project emissions are not known. Emissions are calculated using primary physical activity data for the project's <b>production</b> and emission factors specific to that primary data.
<b>Score 4</b>	<b>Option 3: Economic activity-based emissions</b>	<b>3a</b>	Outstanding amount in the project, total project equity plus debt, and the <b>project's revenue<sup>118</sup></b> are known. Emission factors for the sector per unit of revenue or from similar projects is known (e.g., tCO <sub>2</sub> e per euro of revenue earned in a sector).
		<b>3b</b>	Outstanding amount in the project is known. Emission factors for the sector per unit of asset or economic activity-based emission factors from similar projects (e.g., tCO <sub>2</sub> e per euro of asset in a sector) are known.
<b>Score 5</b>		<b>3c</b>	Outstanding amount in the project is known. Emission factors for the sector per unit of revenue (e.g., tCO <sub>2</sub> e per euro of revenue earned in a sector) and <b>asset turnover ratios</b> for the sector or from similar projects are known.

A detailed summary of the data quality score table, including data needs and equations to calculate financed emissions, is provided in Annex 10.1 (Table 10-3).

PCAF expects that the financed emissions for most projects can be derived through either reported emissions (Option 1), physical activity data (Option 2), or economic activity data (Option 3).

<sup>116</sup> The quality scoring for Option 2a is only possible for/applicable to scope 1 and scope 2 emissions as scope 3 emissions cannot be estimated by this option. Other options can be used to estimate the scope 3 emissions, however.

<sup>117</sup> Supplier-specific emission factors (e.g., from an electricity provider) for the respective primary activity data are always preferred over non-supplier-specific emission factors.

<sup>118</sup> If revenue is not deemed a suitable financial indicator for estimating the emissions of a project, one can apply other suitable financial indicators as a proxy. If an alternative indicator is used, the reasoning for the selection of this alternative indicator should be made transparent. The data quality score will not be affected.



## Avoided emissions

Avoided emissions related to renewable power projects are the reduction in emissions of the financed project compared to what would have been emitted in the absence of the project (the baseline emissions). They are calculated based on the GHG Protocol for Project Finance and are a separate category compared to the calculation of absolute emissions based on the GHG Protocol for Corporate Accounting.

Calculating the annual avoided emissions from a financial institution's renewable power project portfolio at a fixed point in time and in line with the financial reporting cycle is a complex process. The (estimated) annual power production of these projects over the reporting period must be compared with the power mix per country over the same period. In this comparison, it is assumed that the production of renewable power (over the reporting period) might have avoided the need to run certain fossil fuel power plants.

The power mix and associated grid emission factors can be derived using various approaches and assumptions, as illustrated in Table 5-7.

**Table 5-7. Emission factors per type of power mix**

Preferred options	Type of mix	Description of emission factors
<b>1</b>	Operating margin <sup>119</sup>	Emission factors based on the existing fossil fuel power plants in a country/region whose operation will be most affected (reduced) by the project (i.e., the generation from the power plants with the highest variable operating costs in the economic merit order dispatch of the electricity system).
<b>2</b>	Fossil fuel mix traded	Emission factors based on the emissions of all fossil fuel power (including or excluding nuclear) traded (i.e., produced and imported minus exported) in a country or region.
<b>3</b>	Fossil fuel mix produced	Emission factors based on the emissions of all fossil fuel power (including or excluding nuclear) produced in a country or region.
<b>4</b>	Average electricity mix	Emission factors based on the emissions of all power (fossil and non-fossil) produced in a country or region.

Various publicly available data sources on national and international levels are available and provide the data to calculate these emission factors (e.g., International Energy Agency (IEA), US Environmental Protection Agency (EPA), European Environment Agency (EEA)).

PCAF prefers to use the operating margin emission factor for the accounting of the avoided emissions of renewable power project portfolios over the reporting period. The International Finance Institution (IFI)-harmonized GHG accounting standards and approaches calculated these operating margin emission factors for various countries using the methodology published by the IFI Technical Working Group on Greenhouse Gas Accounting.<sup>120</sup>

<sup>119</sup> The operating margin is a term defined under the UNFCCC Clean Development Mechanism for grid-connected electricity generation from renewable sources and represents the cohort of existing power plants whose operation will be most affected (reduced) by the project.

<sup>120</sup> (IFI, 2020)



If the operating margin is not available, financial institutions can use the fossil fuel mix traded, the fossil fuel mix produced, or (as a last resort) the average electricity mix. In principle, PCAF recommends excluding nuclear energy in line with the IFI methodology but also allows the inclusion of nuclear as most data sources include nuclear power under the fossil fuel mix.

## **Emissions removals**

Emissions removals can be relevant for project finance. Sequestered emissions (which is one form of emissions removals) account for carbon sinks where carbon is absorbed from the atmosphere. PCAF participants are developing more detailed guidance on accounting for sequestered emissions and emissions removals, which will be provided in later editions of the Standard.

## **Lifetime emissions**

Portfolio accounting of emissions occurring in the reporting year does not consider lifetime emissions insofar as these emissions happen before or after the reporting year. For example, emissions related to future disposal of a wind park are not reported in the current reporting year.

Nevertheless, this principle is problematic for construction projects. For example, in the case of a gas-fired power plant, construction emissions would be accounted during the construction phase and operational emissions during the operational phase. However, if the loan is repaid shortly after operation starts, the portfolio emissions for that investment would only reflect a small portion of the total emissions impact during the gas-fired power plant's lifetime.

As the power plant is often constructed by a third party (i.e., a construction company) contracted by the project developer, the emissions of the construction and purchased goods and services are normally reported under scope 3 of the project developer. These Scope 3 emissions are usually not significant enough to report or they might be unavailable, in which case no emissions will be reported. When these Scope 3 emissions are relevant, they should be reported.

To address the above a financial institution should, if they are an initial sponsor or lender, assess the total projected lifetime scope 1 and 2 emissions for projects that were financed during the reporting year. Those emissions should be reported separately in the year of contracting. If a financial institution would be an initial lender for the above example of a gas-fired power plant, it should report in the year of contracting the total projected lifetime scope 1 and 2 emissions based on the expected load factor, the expected lifetime of the plant, and the expected carbon content of the gas used.

## Portfolio vs. (annualized) lifetime emissions

Various (multilateral) development banks have been working on harmonizing GHG accounting of new projects under the IFI Framework for a Harmonized Approach to Greenhouse Gas Accounting.<sup>121</sup> These financial institutions developed a methodology to calculate the expected emissions of newly signed contracts for specific projects in the reporting year.<sup>122</sup> In the IFI methodology, avoided emissions are assessed using emission factors (called combined margin) that incorporate future greening of the electricity grid. These avoided emissions are annualized and reported in the year of loan/equity origination.

Unlike the IFI methodology, PCAF's portfolio GHG accounting involves calculating the annual emissions linked to the financial institution's balance sheet and using emission factors (operating margin) that are based on the existing fossil fuel power plants in a country or region whose operation will be most affected (reduced) by the project.

PCAF considers portfolio and (annualized) lifetime GHG accounting to be complementary. Portfolio GHG accounting better lends itself to target setting compared to a global carbon budget, whereas (annualized) lifetime GHG accounting can be used to reflect the generated emissions or avoided emissions over the operational lifetime. Portfolio GHG accounting is more suited to guide strategic developments on a portfolio level, while lifetime GHG accounting can be used to make investment-level decisions (e.g., to avoid investments with carbon lock-in).

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121 (UNFCCC, 2015). Additional information can be found at: <https://unfccc.int/climate-action/sectoral-engagement/ifis-harmonization-of-standards-for-ghg-accounting>

122 The emission factors can be found at: <https://unfccc.int/climate-action/sectoral-engagement/ifis-harmonization-of-standards-for-ghg-accounting/ifi-twg-list-of-methodologies>



# 5.4 Commercial real estate

Introduction

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Understand what GHG accounting is

CHAPTER 2

Identify business goals

CHAPTER 3

Review accounting and reporting principles and rules

CHAPTER 4

Review and apply accounting methodologies for each asset class

CHAPTER 5

Report emissions

CHAPTER 6



## Asset class definition

This asset class includes on-balance sheet loans for specific corporate purposes, namely the purchase and refinance of commercial real estate (CRE), and on-balance sheet investments in CRE. This definition implies that the property is used for commercial purposes, such as retail, hotels, office space, industrial, or large multifamily rentals. In all cases, the building owner or investor leases the property to tenants to conduct income-generating activities.

CRE investments by asset owners are also included in this method. These investments consist of deals where the asset owner fully owns the building or partially owns it in a joint venture, joint operation, or in joint ownership.

CRE investments listed in the stock market are classified as listed equity. In this case, financial institutions shall use the method for listed equity (subchapter 5.1).

Loans secured by CRE for other purposes than CRE and loans to CRE companies that are unsecured are classified as business loans if the loans are for general corporate purposes (i.e., with unknown use of proceeds as defined by the GHG Protocol). In these cases, financial institutions shall use the method for business loans (subchapter 5.2).

Loans for construction and renovation of CRE are optional. As the building is often constructed by a third party (i.e., a construction company) contracted by the project developer, the emissions of the construction are normally reported under scope 3 of the project developer during the building's construction phase. As such, it can be impractical for the lender to measure financed emissions of a construction or renovation loan unless the project developer reports construction emissions (see further explanation below under Emission scopes covered).

## Emission scopes covered

For property already built, financial institutions shall cover the absolute scope 1 and 2 emissions related to the energy use of financed buildings during their operation (energy use includes the energy consumed by the building's occupant and shared facilities).

Reporting financed emissions from construction or renovation of buildings is optional. When measuring these emissions, financial institutions should refer to the GHG Protocol's guidance to account for construction emissions.<sup>123</sup> If the property developer is a company that measures and reports construction emissions, financial institutions should account for the related financed emissions during the building's construction phase. If the property developer does not measure and report construction emissions, financial institutions should engage with the property developer to encourage the practice of measuring and reporting these emissions.

While reporting financed construction emissions is not yet required, PCAF acknowledges that construction emissions, notably building's embodied GHG emissions, are important and should

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<sup>123</sup> (ENCORD, 2012)

not be neglected. PCAF will continue to monitor guidance developments<sup>124</sup> on the subject and when robust approaches and data to measure buildings' embodied emissions are available, PCAF could expand its coverage to include these emissions.

## Attribution of emissions

When calculating the financed emissions, a building's annual emissions are attributed based on the ratio between the outstanding amount and the property value at origination. This ratio is called the attribution factor:

$$\text{Attribution factor}_b = \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b}$$

(with  $b$  = building)

For loan providers, the numerator is the outstanding loan amount,<sup>125</sup> whereas for investors, it is the outstanding investment amount. In both cases, the outstanding amount is the value of the loan or investment on the financial institution's balance sheet.

When the property value at origination is not feasible to obtain, financial institutions shall use the latest property value available and fix this value for the following years of GHG accounting (i.e., the denominator remains constant from the first year of GHG accounting onward).<sup>126</sup> The property value should include the value of the land, the building, and any building improvements. When a CRE loan is modified (e.g., loan amount is increased, renewed, refinanced, or extended) and a new property value is obtained as part of the transaction, the property value at origination shall be updated to the property value at the time of the modification.

When asset owners invest in CRE they either fully finance the property or partially finance it through joint ventures, joint operation, or in joint ownership with other asset owners. When CRE is fully financed by an asset owner, 100% of the building's emissions are attributed to the asset owner. When CRE is jointly financed by a group of asset owners, the attribution is based on the share invested by each asset owner.

124 For example, the World Business Council for Sustainable Development (WBCSD) is working on creating an approach for the embedded carbon of constructions. At this point, they are defining a theoretical approach with a working group consisting of real estate developers, building material producers, construction companies, and technical consultants. The key in this approach is to use a life cycle assessment to obtain average values of embedded carbon per square meter of building, which will differ per climate zone and building typology.

125 For loan providers, the outstanding amount in the numerator is defined as the value of the debt that the borrower owes to the lender (i.e., disbursed debt minus any repayments). It will be adjusted annually to reflect the correct exposure, resulting in the attribution to decline to 0 at the end of the lifetime of the loan (i.e., when it is fully repaid).

126 Availability of property value at origination varies by country. In some countries, financial institutions can easily retrieve the property value at origination from their books and do not typically update it to the current property value. In other countries, regulators require financial institutions to update the property value year over year.

## Equations to calculate financed emissions

Financed emissions of a CRE loan or investment are calculated by multiplying the attribution factor by the building's emissions. Thus, financed emissions are calculated as follows:

$$\text{Financed emissions} = \sum_b \text{Attribution factor}_b \times \text{Building emissions}_b$$

(with  $b$  = building)

The emissions of buildings are calculated as the product of a building's energy consumption and specific emission factors for each source of energy consumed. The total energy use of the building includes the energy consumed by the building's occupants.

$$\text{Financed emissions} = \sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Energy consumption}_{b,e} \times \text{Emission factor}_e$$

(with  $b$  = building and  $e$  = energy source)

## Data required

Actual building energy consumption is preferred but may not be widely available. In the absence of metered data, energy use can be estimated based on building characteristics and publicly available data.

Various sources and commercial databases are available and divide energy consumption by characteristics like energy label, type of property, and floor area of property. When applying these data on a large sample of financed properties, it is possible to get a reasonable approximation of the emissions. Similarly, supplier-specific emission factors<sup>127</sup> for specific energy sources should be used if they are available. If they are not, average emission factors<sup>128</sup> may be used. PCAF's web-based emission factor database provides emission factors by building type, floor area, and number of buildings for a large set of geographies.

To improve building energy use estimation, financial institutions should collect data on building characteristics (e.g., size, building use, climate zone, and year constructed). Based on the data available, the following data hierarchy is proposed in order of preference:

<sup>127</sup> In the case of electricity, supplier-specific emission factors are the same as market-based emission factors.

<sup>128</sup> In the case of electricity, average emission factors, which are non-supplier-specific emission factors, are the same as location-based emission factors.

**Table 5-9. General description of the data quality score table for CRE**

(score 1 = highest data quality; score 5 = lowest data quality)

Data Quality	Options to estimate the financed emissions		When to use each option
Score 1	<b>Option 1: Actual building emissions</b>	1a	Primary data on <b>actual building energy consumption</b> (i.e., metered data) is available. Emissions are calculated using actual building energy consumption and <b>supplier-specific emission factors</b> <sup>129</sup> specific to the respective energy source.
Score 2		1b	Primary data on <b>actual building energy consumption</b> (i.e., metered data) is available. Emissions are calculated using actual building energy consumption and <b>average emission factors</b> specific to the respective energy source.
Score 3	<b>Option 2: Estimated building emissions based on floor area</b>	2a	<b>Estimated building energy consumption per floor area based on official building energy labels AND the floor area</b> are available. Emissions are calculated using estimated building energy consumption and <b>average emission factors</b> specific to the respective energy source.
Score 4		2b	<b>Estimated building energy consumption per floor area based on building type and location-specific statistical data AND the floor area</b> are available. Emissions are calculated using estimated building energy consumption and <b>average emission factors</b> specific to the respective energy source.
Score 5	<b>Option 3: Estimated building emissions based on number of buildings</b>	3	<b>Estimated building energy consumption per building based on building type and location-specific statistical data AND the number of buildings</b> are available. Emissions are calculated using estimated building energy consumption and <b>average emission factors</b> specific to the respective energy source.

A detailed summary of the data quality score table, including data needs and equations to calculate financed emissions, is provided in Annex 10.1 (Table 10-4).

## Other considerations

### Grid emission factors

Consumed energy can be converted to CO<sub>2</sub>e using emission factors. When converting building energy use to emissions, care should be taken to use emission factors that are appropriate to the energy type used in the building (e.g., electricity, natural gas, fuel oil, steam). These factors should be specified according to the type of energy consumed.

<sup>129</sup> Supplier-specific emission factor is an emission rate provided by the energy supplier (e.g., utility) to its customers reflecting the emissions associated with the energy it provides (e.g., electricity, gas, etc.). Average emission factors represent the average emissions of the respective energy sources occurring in a defined boundary (e.g., national or subnational).



**Building characteristics**

Various building characteristics can be taken into consideration to provide additional resolution to average energy consumption and emissions when actual data is unavailable. Many countries conduct surveys to publicly provide building type and location-specific statistical data on average energy consumption by characteristics such as floor space, principle building activity, region, number of floors, and year constructed. Other national surveys might provide tables on emissions and energy source or end use by industry and region.

Where possible, the most common regional electricity grid mix data for the building's location should be used. If unavailable, country-level electricity grid mix emissions data should be used.

**Limitations****Country-specific assumptions**

Many countries lack widespread use of building energy labels, and it may be challenging for financial institutions to access a borrower's measured energy consumption data. As such, limited actual data will require financial institutions to estimate building energy use. Institutions may find that the data they have available in the existing portfolio requires using average values. Collecting additional building data at loan or investment origination may improve future estimations of energy use. Some municipal governments are collecting building energy data, and this could prove useful for some financial institutions.

Some country-specific adjustments will need to be made to make the calculation applicable depending on the data availability and standards in each country. The variations across countries in their systems of categorizing the energy efficiency of buildings require a tailored approach for optimal accuracy in calculations.

**Property value**

This Standard requires financial institutions to use the property values determined at origination as a CRE loan or investment is made in relation to the original value of the property. Thus, using the outstanding amount to the original value provides a consistent estimate of the proportion of the project attributable to the loan and investment. Nevertheless, PCAF recognizes that availability of property value at origination varies globally. In some countries, financial institutions can easily retrieve the property value at origination from their books and do not typically update it on an annual basis. In other countries, regulators require financial institutions to update property values annually.

Considering these differences and to ensure as much consistency as possible in the calculations, when financial institutions do not have the property value at origination, they shall use the latest property value available and they shall fix this value for the following years of GHG accounting (i.e., the denominator remains constant from the first year of GHG accounting onward).

The property value includes the value of the land, the building, and any building improvements.



# 5.5 Mortgages

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## Asset class definition

This asset class includes on-balance sheet loans for specific consumer purposes—namely the purchase and refinance of residential property, including individual homes and multifamily housing with a small number of units. This definition implies that the property is used only for residential purposes and not to conduct income-generating activities.

If the loan is used to refinance a mortgage and this loan is provided by the original mortgage provider, the new loan supersedes the original mortgage. If the refinancing is done by an institution other than the original loan provider, the new loan and associated building's emissions are attributed to the institution providing the loan for refinancing.

Home equity loans (HELs) and home equity lines of credit (HELOCs) are not required under this methodology given that these products are generally consumer loans for general consumer purposes (with unknown use of proceeds as defined by the GHG Protocol).<sup>130</sup>

Mortgages used to construct or renovate a house are not required at this point given that the homeowner does not directly account for construction emissions. As a home is often constructed or renovated by a third party (i.e., a home builder) contracted by the homeowner, the emissions of the construction would normally be accounted by the third party during the building's construction phase.<sup>131</sup>

Nevertheless, PCAF acknowledges that construction emissions, notably building's embodied GHG emissions, are important and should not be neglected. PCAF recommends financial institutions find opportunities in the due diligence process to influence the homeowner into making low carbon choices. PCAF will continue to monitor guidance developments<sup>132</sup> on the subject and when robust approaches and data to measure buildings' embodied emissions are available, PCAF could expand its coverage to include these emissions.

## Emission scopes covered

Financial institutions shall cover the absolute scope 1 and 2 emissions related to the energy use of the property financed through the mortgage (energy use includes the energy consumed by the building occupant). For example, if the mortgage is used to purchase a multifamily home with shared facilities, scope 1 and 2 emissions of the whole property should be covered. If the mortgage is used to buy a single apartment or house, emissions related to the apartment or house should be covered.

<sup>130</sup> If the consumer loan is to purchase motor vehicles, financial institutions shall use the motor vehicle loans asset class method (subchapter 5.6).

<sup>131</sup> Theoretically, these emissions would be categorized under scope 3 of the homeowner, but in practice homeowners do not report emissions; thus, it is impractical for financial institutions to measure financed emissions of a construction or renovation mortgage.

<sup>132</sup> For example, the WBCSD is working on creating an approach for the embedded carbon of constructions. At this point, they are defining a theoretical approach with a working group consisting of real estate developers, building material producers, construction companies, and technical consultants. The key in this approach is to use a life cycle assessment to obtain average values of embedded carbon per square meter of building, which will differ per climate zone and building typology.

## Attribution of emissions

When calculating financed emissions, a building's annual emissions are attributed to the mortgage provider using a loan-to-value approach. Thus, the attribution is equal to the ratio of the outstanding amount at the time of GHG accounting to the property value at loan origination.

$$\text{Attribution factor}_b = \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b}$$

(with  $b$  = building)

When the property value at origination is not feasible to obtain, financial institutions shall use the latest property value available and fix this value for the following years of GHG accounting (i.e., the denominator remains constant).<sup>133</sup>

The attribution approach assumes the residential property owner also takes ownership of the building's emissions.

## Equations to calculate financed emissions

Financed emissions of mortgages are calculated by multiplying the attribution factor by the building's emissions. Thus, financed emissions are calculated as follows:

$$\text{Financed emissions} = \sum_b \text{Attribution factor}_b \times \text{Building emissions}_b$$

(with  $b$  = building)

The emissions of buildings are calculated as the product of a building's energy consumption and specific emission factors for each source of energy consumed. The total energy use of the building includes the energy consumed by the building's occupant. The equation below is the result.

$$\text{Financed emissions} = \sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Energy consumption}_{b,e} \times \text{Emission factor}_e$$

(with  $b$  = building and  $e$  = energy source )

<sup>133</sup> Availability of property value at origination varies by country. In some countries, financial institutions can easily retrieve the property value at origination from their books and do not typically update it to the current property value. In other countries, regulators require financial institutions to update the property value year over year.

## Data required

The availability of data on the energy consumption of properties is still limited in many countries; in others, it has improved considerably due to policy regulations within the built environment (like the introduction of energy performance certificates and energy labels). In such countries, the available data is usually anonymized by averaging data over several households in the same peer group. Often, buildings' energy data is available by energy label, type of household or sector, and type of property. When applying these data on many financed properties, it is possible to get a reasonable approximation of the emissions.

As more data sources become available institutions are expected to move up the data hierarchy, but easily accessible data for many countries is currently between score 4 and 5 of the data quality score table provided below.

Some financial institutions may not collect information on property size, in which case they can use the average energy consumption by building and geographic region. Financial institutions should use the highest quality dataset available and evaluate new data sources on a regular basis.

Supplier-specific emission factors<sup>134</sup> for specific energy sources should be used if they are available. If they are not, average emission factors<sup>135</sup> may be used. PCAF's web-based emission factor database provides emission factors by building type (e.g., single-family house and multifamily house), floor area, and number of buildings for a large set of geographies.

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<sup>134</sup> In the case of electricity, supplier-specific emission factors are the same as market-based emission factors.

<sup>135</sup> In the case of electricity, average emission factors, which are non-supplier-specific emission factors, are the same as location-based emission factors.

The following data hierarchy is proposed in order of preference:

**Table 5-10. General description of the data quality score table for mortgages**

(score 1 = highest data quality; score 5 = lowest data quality)

Data Quality	Options to estimate the financed emissions	When to use each option
<b>Score 1</b>	<b>Option 1: Actual building emissions</b>	<b>1a</b> Primary data on <b>actual building energy consumption</b> (i.e., metered data) is available. Emissions are calculated using actual building energy consumption and <b>supplier-specific emission factors</b> <sup>136</sup> specific to the respective energy source.
<b>Score 2</b>		<b>1b</b> Primary data on <b>actual building energy consumption</b> (i.e., metered data) is available. Emissions are calculated using actual building energy consumption and <b>average emission factors</b> specific to the respective energy source.
<b>Score 3</b>	<b>Option 2: Estimated building emissions based on floor area</b>	<b>2a</b> <b>Estimated building energy consumption per floor area based on official building energy labels AND the floor area</b> are available. Emissions are calculated using estimated building energy consumption and <b>average emission factors</b> specific to the respective energy source.
<b>Score 4</b>		<b>2b</b> <b>Estimated building energy consumption per floor area based on building type and location-specific statistical data AND the floor area</b> are available. Emissions are calculated using estimated building energy consumption and <b>average emission factors</b> specific to the respective energy source.
<b>Score 5</b>	<b>Option 3: Estimated building emissions based on number of buildings</b>	<b>3</b> <b>Estimated building energy consumption per building based on building type and location-specific statistical data AND the number of buildings</b> are available. Emissions are calculated using estimated building energy consumption and <b>average emission factors</b> specific to the respective energy source.

A detailed summary of the data quality score table, including data needs and equations to calculate financed emissions, is provided in Annex 10.1 (Table 10-5).

Financial institutions should work with actual data on the energy consumption of properties, if available. The consumed energy at the household level (e.g., gas, electricity, heating oil, wood) can be converted to CO<sub>2</sub>e-emissions using supplier-specific emission factors or average emission factors if no emissions data is provided in the chosen data sources (some data sources report only energy use whereas others report CO<sub>2</sub>e emissions). As an intermediate step, financial institutions could start collecting building size data (in addition to geographic location and building type) and energy labels, where available, to more accurately capture the associated emissions of their mortgages.

<sup>136</sup> Supplier-specific emission factor is an emission rate provided by the energy supplier (e.g., utility) to its customers reflecting the emissions associated with the energy it provides (e.g., electricity, gas, etc.). Average emission factors represent the average emissions of the respective energy sources occurring in a defined boundary (e.g., national or subnational).



## Other considerations

### Obtaining data on energy consumption

Actual energy consumption data (but also specific to a certain mortgage portfolio) is preferred as this will be more accurate than working with average energy consumption. In some markets with clear government partnerships on climate action, financial institutions might attempt to work at the policy level to obtain actual data directly from grid operators.

Almost all grids are becoming lower emission over time, providing gradually reduced emissions for mortgage portfolios. Where possible, the most common regional electricity grid mix data for the building's location should be used; if unavailable, country-level electricity grid mix emissions data should be used. If actual consumption data is unavailable, financial institutions should start collecting building size, geographic location, and building type data to more accurately capture the associated emissions of their mortgages.

If actual energy consumption data is used, it may be unclear if all the energy consumption is applicable solely for the house or, for instance, also for an electric vehicle (EV). If possible, the actual energy consumption data can be further disaggregated to differentiate the electricity used in the home from the electricity used for charging the vehicle.

### Off-balance mortgages and subsidiaries

The scope of this methodology is on-balance mortgages; off-balance are not included. If relevant and substantial, off-balance sheet mortgages can be reported separately.

### Distinguishing between private and corporate mortgages

No distinction is made between private or corporate mortgages.

### Improving a home's energy performance

The attribution approach assumes the residential property owner also takes ownership of the building's emissions. During the mortgage period, financial institutions may have the opportunity to work with the property owner to lower the building emissions by offering additional financial services; these services are used to improve the building's energy performance (green mortgages, low carbon mortgages, or energy efficient mortgages are some of the existing products in various markets around the globe).

## Limitations

### Results depend on data quality

Many assumptions must be made to calculate the emissions of mortgages as data is often difficult to retrieve for privacy reasons. Even though the calculation method does not differ greatly, the data sources used can yield different results—for instance, when average consumption data is replaced by actual consumption data from grid operators.

### Country-specific assumptions

Some country-specific adjustments will need to be made to make the calculation applicable depending on the data availability and standards in each country. The variations across countries in their systems of categorizing the energy efficiency of houses require a tailored approach for optimal accuracy in calculations.



# 5.6 Motor vehicle loans

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## Asset class definition

This asset class refers to on-balance sheet loans and lines of credit for specific (corporate or consumer) purposes (i.e., with known use of proceeds as defined by the GHG Protocol) to businesses and consumers that are used to finance one or several<sup>137</sup> motor vehicles.

Financial institutions will finance different vehicle types and will also use different internal definitions and categories for the motor vehicle types being financed by their investments. For example, one financial institution may have a portfolio mainly of passenger cars and motorcycles, while another financial institution may have a strong share of buses and heavy duty trucks.

This methodology does not prescribe a specific list of vehicle types falling within this asset class; instead, it leaves it open for financial institutions to decide and define what vehicle types to include in their inventory of financed emissions. It is the responsibility of each financial institution to define the vehicle types included in their inventory of financed emissions and, in the case of leaving a specific vehicle type out of the GHG accounting exercise, provide a transparent explanation of why a vehicle type is excluded.

The following list exemplifies the vehicle types that may fall under the asset class of motor vehicle loans—it is not exhaustive:

- Passenger car
- Motorcycle
- Light commercial truck (e.g., vans)
- Medium/heavy commercial truck
- Recreational vehicles
- Bus
- Snowmobiles/all-terrain vehicles
- Boats, including outboard motors<sup>138</sup>
- Yellow equipment (i.e., earth-moving vehicles for mining and construction)

This is not an exhaustive list as other vehicle types can also be included.

Financial institutions typically finance motor vehicle loans through consumer lending or business lending. Consumer lending for motor vehicles includes financing the purchase of a motor vehicle for a private person, whereas business loans for motor vehicles typically includes financing a fleet of motor vehicles for a business.<sup>139</sup>

<sup>137</sup> A single loan might cover the purchase of several vehicles or fleets. In any case, the methodology presented in this chapter should be used.

<sup>138</sup> Depending on the portfolio of some financial institutions, it may be appropriate to differentiate between the vehicle and the propulsion system of that vehicle. In this case, it is possible to apply the methodology for the vehicle as a whole but also to the propulsion system on its own. An example of this are financial institutions that have boats on their portfolio. In this case, it is common to have loans for boats and also loans for outboard motors alone.

<sup>139</sup> Note that the term “fleet” does not necessarily refer to multiple vehicles only—it can also refer to a single business vehicle.

## Emission scopes covered

Financial institutions shall calculate and report the annual scope 1 and scope 2 emissions of the vehicles being financed:

- Scope 1: Direct emissions from fuel combustion in vehicles
- Scope 2: Indirect emissions from electricity generation consumed in EVs (hybrid and fully EVs)

Scope 3 emissions related to the production of vehicles, delivery of vehicles to buyers, or decommissioning of vehicles after use do not need to be covered; these emissions are difficult to obtain and they can be considered rather marginal. However, if a financial institution seeks to account for the production emissions of new vehicles (i.e., embodied emissions) for whatever reason, they should report the emissions as follows:

- In the initial financing year, the financial institution shall report the production emissions of the respective vehicle as a lump sum under scope 3 emissions, while the operation emissions in the respective year shall be reported under scope 1 or 2 emissions.
- In the following financing years, the financial institution shall not report any production emissions of the respective vehicle; they shall only report the operation emissions under scope 1 or 2 emissions.

This approach on scope 3 emissions only holds for new vehicles, not used vehicles.

## Attribution of emissions

As a basic attribution principle, the financial institution accounts for a portion of the borrower's annual motor vehicle emissions as determined by the ratio between the outstanding amount (numerator) and the value of the motor vehicle at origination (denominator). This ratio is called the attribution factor:

1. **Outstanding amount (numerator):** This is the actual outstanding motor vehicle loan amount, defined as the value of the debt that the debtor owes to the creditor. It will be adjusted annually to reflect the correct exposure, resulting in the attribution to decline to 0 at the end of the lifetime of the loan (i.e., when it is fully repaid). Financial institutions should either use the calendar or financial year-end outstanding loan, provided the approach is communicated and used consistently.
2. **Total value at origination (denominator):** This is the total value of the motor vehicle at origination, which corresponds to the price of the vehicle at the moment the transaction was done (i.e., equity plus debt at origination).

$$\text{Attribution factor}_v = \frac{\text{Outstanding amount}_v}{\text{Total value at origination}_v}$$

(with  $v$  = vehicle or vehicle fleet)

If the total value of the motor vehicle at origination (i.e., the denominator) is unknown, financial institutions should take a conservative approach and assume 100% attribution. As soon as the motor vehicle loan is repaid, the financed emissions associated to that loan are equal to 0.

## Equations to calculate financed emissions

The financed emissions from a motor vehicle loan are calculated by multiplying the attribution factor by the emissions of the motor vehicle. The total financed emissions from multiple motor vehicle loans are calculated as follows:

$$\text{Financed emissions} = \sum_v \text{Attribution factor}_v \times \text{Vehicle emissions}_v$$

(with  $v$  = vehicle or vehicle fleet)

The emissions can, in principle, be calculated by multiplying the vehicle distance traveled (e.g., km) by the vehicle's fuel efficiency (e.g., l diesel/km, kWh electricity/km) and the vehicle's fuel type-specific emission factor (e.g., kg CO<sub>2</sub>e/l diesel, kg CO<sub>2</sub>e/kWh electricity). The total financed emissions from multiple motor vehicle loans are calculated as follows:

$$\text{Financed emissions} = \sum_v \left( \frac{\text{Outstanding amount}_v}{\text{Total value at origination}_v} \right) \times \text{Vehicle emissions}_v$$

$$\text{Financed emissions} = \sum_{v,f} \left( \frac{\text{Outstanding amount}_v}{\text{Total value at origination}_v} \right) \times \text{Distance travel}_v \times \text{Efficiency}_{v,f} \times \text{Emission factor}_f$$

(with  $v$  = vehicle or vehicle fleet,  $f$  = fuel type)

The financed emissions from motor vehicle loans can be calculated in several ways depending on the availability of data to derive the financed vehicle's emissions. Overall, PCAF distinguishes three options to calculate the financed emissions from motor vehicle loans depending on the data used:<sup>140</sup>

- **Option 1: actual vehicle-specific emissions,<sup>141</sup>** where emissions are calculated based on actual vehicle fuel consumption or actual vehicle distance traveled for a known vehicle make and model with data directly collected from the borrower.
  - **Option 1a:** Vehicle emissions are calculated based on primary data on **actual vehicle fuel consumption**.
  - **Option 1b:** Vehicle emissions are calculated based on vehicle efficiency and fuel type (fossil or electricity) from **known vehicle make and model<sup>142</sup>** and primary data for **actual vehicle distance traveled**.

<sup>140</sup> For all options the attribution factor is calculated in the same way; the only thing changing is the way vehicle emissions are calculated.

<sup>141</sup> For motor vehicle loans to consumers, this approach seems rather unrealistic as consumers are unlikely to report their actual fuel consumption or distance traveled to a financial institution. However, for motor vehicle loans to businesses (in particular for financing of company-owned staff cars), companies often collect information on actual fuel consumption or distance traveled and could share such information with financial institutions.

<sup>142</sup> Vehicle make and model refers to the name of the company that manufactures the vehicle and the product name of the vehicle. For example, Toyota Prius.

- **Option 2: estimated vehicle-specific emissions**, where emissions are calculated based on estimated vehicle distance traveled for a known vehicle make and model with data collected from official statistics.
  - **Option 2a:** Vehicle emissions are calculated based on vehicle efficiency and fuel type (fossil or electricity) from **known vehicle make and model and estimated vehicle distance traveled** derived from **local statistical data**.<sup>143</sup>
  - **Option 2b:** Vehicle emissions are calculated based on vehicle efficiency and fuel type (fossil or electricity) **from known vehicle make and model** and **estimated vehicle distance** traveled derived from **regional statistical data**.<sup>144</sup>
- **Option 3: estimated vehicle-unspecific emissions**, where emissions are calculated based on estimated vehicle distance traveled for an unspecified vehicle with data collected from official statistics.
  - **Option 3a:** Vehicle emissions are calculated based on vehicle efficiency and fuel type (fossil or electricity) from **known vehicle type**<sup>145</sup> (vehicle make and model are unknown) and **estimated vehicle distance traveled** derived from **local or regional statistical data**.
  - **Option 3b:** Vehicle emissions are calculated based on vehicle efficiency and fuel type (fossil or electricity) from an **average vehicle** (vehicle make and model and vehicle type are unknown)<sup>146</sup> and **estimated vehicle distance traveled** derived from **local or regional statistical data**.

## Data required

PCAF distinguishes three options with six suboptions to calculate the financed emissions from motor vehicle loans depending on the data used. Although Option 1b, Option 2a, and Option 2b are all based on known vehicle characteristics on vehicle efficiency and fuel type, the data used for vehicle distance travel is of higher quality for Option 1b than it is for Option 2a, and it is of higher quality for Option 2a than it is for Option 2b. In this sense, while there are several options to calculate financed emissions, the quality of the results is not the same for all these options. For this reason, PCAF gives a higher score to results obtained with higher data quality and a lower score to results obtained with lower data quality (score 1 = highest data quality; score 5 = lowest data quality). If a financial institution uses a mix of options to calculate the emissions of a borrower (e.g., actual distance traveled and vehicle type is known, while vehicle make and model is unknown, which means that Option 1b and Option 3a are mixed), the data score for the lower-rated option should be assumed for this borrower (i.e., score 4 from Option 3a).

Table 5-10 provides data quality scores for each of the described options that can be used to calculate the financed emissions for motor vehicle loans.

<sup>143</sup> Local statistical data refers to statistical data at the province/state or small country level.

<sup>144</sup> Regional statistical data refers to statistical data at the large country or a subcontinental level.

<sup>145</sup> Vehicle type refers to an overall vehicle class such as passenger car, bus, or light commercial truck.

<sup>146</sup> If it is not possible to know the vehicle type, then an average vehicle can be assumed.



**Table 5-10. General description of the data quality score table for motor vehicle loans**(score 1 = highest data quality; score 5 = lowest data quality)<sup>147, 148</sup>

Data Quality	Options to estimate the financed emissions		When to use each option
Score 1	Option 1: Actual vehicle-specific emissions	1a	Outstanding amount and total value at origination of vehicle or vehicle fleet are known. Primary data on <b>actual vehicle fuel consumption</b> is available. Emissions are calculated using actual fuel consumption and fuel type-specific emission factors.
		1b	Outstanding amount and total value at origination of vehicle or vehicle fleet are known. Vehicle efficiency and fuel type (fossil and/or electricity) are available from <b>known vehicle make and model</b> . <sup>149</sup> Primary data on <b>actual vehicle distance</b> traveled is available. Emissions are calculated using estimated fuel consumption and fuel type-specific emission factors.
Score 2	Option 2: Estimated vehicle-specific emissions	2a	Outstanding amount and total value at origination of vehicle or vehicle fleet are known. Vehicle efficiency and fuel type (fossil and/or electricity) are available from <b>known vehicle make and model</b> . <b>Distance traveled is estimated based on local statistical data</b> . <sup>150</sup> Emissions are calculated using estimated fuel consumption and fuel type-specific emission factors.
Score 3		2b	Outstanding amount and total value at origination of vehicle or vehicle fleet are known. Vehicle efficiency and fuel type (fossil and/or electricity) are available from <b>known vehicle make and model</b> . <b>Distance traveled is estimated based on regional statistical data</b> . <sup>151</sup> Emissions are calculated using estimated fuel consumption and fuel type-specific emission factors.
Score 4	Option 3: Estimated vehicle-unspecific emissions	3a	Outstanding amount and total value at origination of vehicle or vehicle fleet are known. Vehicle efficiency and fuel type (fossil and/or electricity) are estimated from <b>known vehicle type</b> (vehicle make and model are unknown). <sup>152</sup> <b>Distance traveled is estimated based on local or regional statistical data</b> . Emissions are calculated using estimated fuel consumption and fuel type-specific emission factors.
Score 5		3b	Outstanding amount and total value at origination of vehicle or vehicle fleet are known. Vehicle efficiency and fuel type (fossil and/or electricity) are estimated for an <b>average vehicle</b> (vehicle make and model and vehicle type are unknown). <sup>153</sup> <b>Distance traveled is estimated based on local or regional statistical data</b> . Emissions are calculated using estimated fuel consumption and fuel type-specific emission factors.

A detailed summary of the data quality score table, including data needs and equations to calculate financed emissions, is provided in Annex 10.1 (Table 10-6).

<sup>147</sup> Fuel type in the case of electric or hybrid vehicles can also refer to electricity.

<sup>148</sup> For all options shown in the table, supplier-specific emission factors (e.g., from electricity provider) for the respective primary activity data are always preferred over non-supplier-specific emission factors (i.e., also sometimes referred to as average emission factors).

<sup>149</sup> Vehicle make and model refers to the name of the company that manufactures the vehicle and the product name of the vehicle. For example, Toyota Prius.

<sup>150</sup> Local statistical data refers to data at the province/state or small country level.

<sup>151</sup> Regional statistical data refers to data at the large country or a subcontinental level.

<sup>152</sup> Vehicle type refers to a passenger car, bus, or light commercial truck.

<sup>153</sup> If it is not possible to know the vehicle type, an average vehicle can be assumed.

Data for all three options can be derived from different data sources. Data on vehicle efficiency and fuel type per vehicle make and model can be derived from official statistical data sources such as the US EPA's Federal Test Procedure<sup>154</sup> and the EEA's Worldwide Harmonized Light Vehicles Test Procedure (WLTP).<sup>155</sup> Both data sources provide detailed vehicle efficiency and fuel type information by make and model. Option 1b, Option 2a, and Option 2b require such information. If make and model are unknown to the reporting financial institution (Option 3), vehicle efficiency and fuel type can be estimated on the vehicle type level (e.g., passenger car) using the International Council on Clean Transportation's (ICCT's) Transportation Roadmap<sup>156</sup> or the International Transport Forum at the Organisation for Economic Co-operation and Development (ITF OECD).<sup>157</sup>

If no actual distance traveled is known to the reporting financial institution, data on vehicle distance traveled can be estimated based on data sources such as the ICCT Transportation Roadmap or the ITF OECD. Several local statistical data sources provide geography-specific vehicle distances traveled. For the US and Canada, state- or province-level distance per year can be retrieved from carinsurance.com<sup>158</sup> and the Canadian Office of Energy Efficiency.<sup>159</sup>

PCAF's web-based emission factor database provides emission factors per vehicle type (e.g., passenger car) and per vehicle make and model (e.g., VW Polo) for a large set of geographies. These motor vehicle emission factors are widely based on the sources mentioned above.

PCAF expects that the financed emissions for motor vehicle loans can be derived through either actual vehicle-specific emissions (Option 1), estimated vehicle-specific emissions (Option 2), or estimated vehicle-unspecific emissions (Option 3). However, PCAF allows the use of alternative approaches to calculate emissions if none of the specified options can be used or in the case that new approaches are developed. The reporting financial institution shall always explain the reasons for using an alternative approach if it deviates from the options defined above.

154 The US EPA's Federal Test Procedure is a series of drive cycle tests to measure the tailpipe emissions and fuel efficiency of passenger cars. Because these tests are used to verify that cars sold in the US meet EPA regulatory standards, their results reflect the road performance of passenger cars in the US. The results for more than 4,000 makes and models are publicly available on fueleconomy.gov, downloadable in .csv format.

155 The WLTP is a global, harmonized standard of drive cycle tests to determine the tailpipe emissions and fuel efficiency of passenger cars. It was developed by the United Nations Economic Commission for Europe to replace the old New European Driving Cycle (NEDC) as the European vehicle homologation procedure. The NEDC was shown to be flawed, enabling manufacturers to meet EU environmental standards during lab tests but not on the road (Dieselgate). The WLTP was conceived to rectify this. The WLTP final version was published in 2015. Hence, even though it will become a truly international standard in time, it is only used in the EU for now, and its results only reflect the performance of cars sold within the EU. These results are published by the EEA in .csv format and can be downloaded at <https://www.eea.europa.eu/data-and-maps/data/co2-cars-emission-16>.

156 The ICCT's Transportation Roadmap has been a global reference for environmental performance data on all major transportation modes, fuel types, and vehicle technologies since 2012. Over the past decade, the ICCT has extended its roadmap model to cover 11 of the largest vehicle markets (Australia, EU, Brazil, Canada, China, India, Japan, Mexico, South Korea, Russia and the US) and five aggregate regions (Africa, Other Asia-Pacific, Other Europe, Other Latin America, and the Middle-East). The most recent results of the model (2017) are downloadable in .xlsx format on the ICCT website: <https://theicct.org/transportation-roadmap#about>.

157 The OECD iLibrary maintains a database of transport statistics collected by the ITF on the transport of freight (maritime, air, and surface) and passengers (car, rail, and air) in its member states [https://www.oecd-ilibrary.org/transport/data/itf-transport-statistics\\_trsprt-data-en](https://www.oecd-ilibrary.org/transport/data/itf-transport-statistics_trsprt-data-en).

158 More information can be found at: <https://www.carinsurance.com/Articles/average-miles-driven-per-year-by-state.aspx>

159 More information can be found at: <http://oee.nrcan.gc.ca/publications/statistics/cvs08/appendix-1.cfm?graph=6&attr=0>

## Limitations

### Data availability

Information regarding actual vehicle distance traveled may not be easily available. If actual data is unavailable, PCAF proposes using local or regional averages on vehicle distance traveled by state, province, country, or region.

PCAF proposes that financial institutions collect the actual vehicle make and model to determine the exact vehicle efficiency and fuel type. If the financial institution does not track the vehicle make and model, PCAF proposes that the financial institution falls back to a generic vehicle type (e.g., passenger car, motorcycle, light commercial truck, medium/heavy commercial truck, bus) or to an average vehicle as a last resort (where the vehicle efficiency is determined by the weighted average vehicle efficiency in the respective geography).

### Dual fuel vehicles

For dual fuel vehicles, the percentage of usage per fuel (e.g., gasoline vs. electricity) may be unknown. If the vehicle make and model is known, PCAF recommends assuming an average usage split for the respective hybrid vehicle based on information from national agencies or the vehicle manufacturer. If such information is not available, PCAF proposes either applying an average geography-specific usage split or (if that is also not available) the conservative assumption that the combustion engine (e.g., gasoline) is used by 100%.

### Electricity grid estimates

Exact electricity source data will not be known for each vehicle in a financial institution's portfolio (e.g., where does the borrower source electricity? Does the borrower source gray or green electricity?). Where possible, the most common local or regional electricity grid mix emission factor for the borrower's location should be used. If unavailable, the most common local or regional electricity grid mix emission factor for the financial institution's branch should be used (i.e., location of the financial institution where the loan was issued). If also unavailable, country-level electricity grid mix emissions data should be used.

# 6. Reporting recommendations and requirements

TIP: 

Introduction

CHAPTER 1

Understand what GHG accounting is

CHAPTER 2

Identify business goals

CHAPTER 3

Review accounting and reporting principles and rules

CHAPTER 4

Review and apply accounting methodologies for each asset class

CHAPTER 5

Report emissions

CHAPTER 6

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. The following reporting recommendations and requirements guide financial institutions to disclose the GHG emissions associated with their loans and investments.

Rather than creating a new framework, PCAF developed these reporting requirements and recommendations to complement existing frameworks such as TCFD, GRI, Sustainability Accounting Standards Board (SASB), generally accepted accounting principles (GAAP), and International Financial Reporting Standards (IFRS). It adheres to and builds upon the reporting requirements set out by the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard.

All financial institutions that commit to using this Standard shall fulfil certain requirements when disclosing their financed emissions publicly. However, they do have the flexibility to decide where they want to start with measuring and disclosing their financed emissions—for instance, at a specific asset class level or for a specific sector within a certain asset class. Flexibility in reporting is allowed largely as a consequence of limitations in data availability and quality. PCAF recognizes that data for many asset classes may not be available to financial institutions and that a financial institution may not be able to disclose 100% of its portfolio. However, financial institutions shall be transparent in their coverage and justify any exclusions.

The requirements for disclosure of financed emissions describe a minimum disclosure level with room for financial institutions to report beyond this level. Any requirements not fulfilled must be accompanied by an explanation. Minimum reporting requirements are described in this chapter using the word “shall.” Where certain aspects of reporting are not required but encouraged as best practice, the word “should” is used.

### Report using the operational or financial control consolidation approach <sup>160</sup>

The asset class methods in this Standard are used to calculate the scope 3 category 15 emissions from financial investments. According to the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard,<sup>161</sup> three consolidation approaches can be applied by financial institutions to account for their scope 1, 2, and 3 emissions—namely equity, operational control, and financial control. For PCAF reporting, financial institutions **shall** use the operational control approach or the financial control approach; as a result, all financed emissions **shall** be accounted for in their scope 3 category 15 reporting.

<sup>160</sup> Additional information on consolidation approaches can be found in Chapter 4.

<sup>161</sup> (WRI and WBCSD, 2011)



## Overall Reporting Requirements and Recommendations

- **Principles:** GHG accounting and reporting of financial institutions **shall** be based on the following principles: relevance, completeness, consistency, transparency, and accuracy.
- **Purpose:** A financial institution's reporting **should** align with its specific business goals; for instance, for identifying and managing climate-related transition risks or for steering toward a specific emissions reduction target.
- **Frequency:** Financial institutions **shall** disclose at least annually and at a fixed point in time in line with the financial accounting cycle. Financial institutions **shall** ensure that the chosen point in time provides a representative view on the emissions for that reporting year and **shall** transparently disclose if large changes close to (before/after) the reporting date affected the results.
- **Recalculation and significance threshold:** Financial institutions **shall**, in line with the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard requirement (pg. 104<sup>162</sup>), establish a baseline recalculation policy to define under which circumstances a recalculating of (base year) financed emissions is necessary to ensure the consistency, comparability, and relevance of the reported GHG emissions data over time. As part of this base year emissions recalculation policy, financial institutions **shall** establish and disclose the significance threshold<sup>163</sup> that triggers base year emissions recalculations.
- **Form of reporting:** Financial institutions **shall** disclose in publicly available reports such as (semi) annual reports, website articles, or other publicly available sources as deemed appropriate by the financial institution. Annex 10.2 provides an example template for how financial institutions can disclose their financed emissions.
- **Past performance:** Where appropriate and relevant for their business goals, financial institutions **should** disclose their financed emissions for multiple comparable time periods (e.g., years).

## Coverage

- Financial institutions **shall** disclose all absolute emissions for all of the relevant asset classes or sectors<sup>164</sup> covered in Chapter 5 and justify any exclusions. Potential justification criteria for exclusion are:
  - Data availability: Required data is not available to the financial institutions.
  - Size: The activities are insignificant to the institution's total anticipated financed emissions.
  - Methodology: There is no global methodology to quantify the financed emissions of specific activities (i.e., asset classes not covered in this Standard).
- Financial institutions **shall** disclose the percentage of their total loans and investments covered in their financed emissions inventories for the six asset classes covered in Chapter 5 (e.g., a financial institution's total outstanding loans and investments by asset class noting any limitations and exclusions).

<sup>162</sup> (WRI and WBCSD, 2011)

<sup>163</sup> Definition according to the GHG Protocol: "A significance threshold is a qualitative and/or quantitative criterion used to define any significant change to the data, inventory boundaries, methods, or any other relevant factors."

<sup>164</sup> Financial institutions can choose to report by sector rather than asset class.



## Gases and units

- Financial institutions **shall** account for the seven gases under the Kyoto Protocol that are also mandated under the UNFCCC to be included in national inventories if they are emitted in the value chain. These are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- These seven gases **shall** be converted to carbon dioxide equivalents (CO<sub>2</sub>e) using the 100-year time horizon global warming potentials published by the IPCC—**either** the AR5 values published by the GHG Protocol<sup>165</sup> or the IPCC's most recently published assessment report.<sup>166</sup>
- Financial institutions **shall** express their financed emissions in metric tonnes of carbon dioxide equivalents (tCO<sub>2</sub>e) or another appropriate metric conversion—e.g., kilotonnes (ktCO<sub>2</sub>e), megatonnes (MtCO<sub>2</sub>e). When emissions from a specific GHG (e.g., methane emissions) are material and relevant, financial institutions **should** consider a separate disclosure of these emissions.
- Biogenic CO<sub>2</sub> emissions that occur in the value chain shall not be included in the scopes but **shall** be included and separately reported in the public report.

## Absolute emissions

- Institutions **shall** disclose the absolute emissions (scope 1 and 2 combined) of their loans and investments. If it serves the financial institutions' business goals, absolute scope 1 and scope 2 emissions of loans and investments **should** be reported separately from each other.
- Beyond the reporting of scope 3 category 15 emissions covered by this Standard, financial institutions **shall** also measure and report their scope 1 and 2 emissions and any other relevant scope 3 emissions categories in line with the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (see Annex 10.2 for an example).
- Where required by the relevant methodology in Chapter 5, financial institutions **shall** separately disclose the absolute scope 3 emissions of their loans and investments, including the specific sectors covered. Financial institutions **shall** explain if they are not able to provide any required scope 3 information because of data availability or uncertainty.
- Financial institutions **shall** disaggregate and disclose absolute emissions data at the asset class or at the sector level, particularly for the most carbon-intensive sectors (e.g., energy, power, cement, steel, automotive).
- When a financial institution is an initial sponsor or lender of a specific project, the institution **should** also assess and report the absolute lifetime scope 1 and 2 emissions of the project that was financed during the reporting year.

<sup>165</sup> (GHG Protocol, 2014)

<sup>166</sup> The IPCC reports can be found at: <https://www.ipcc.ch>

**Box 6. Double counting in reporting absolute emissions**

Double counting—which occurs when GHG emissions are counted more than once in the financed emissions calculation of one or more institutions—should be avoided as much as possible. Double counting occurs between the different scopes of emissions from loans and investments when a financial institution invests in stakeholders that are in the same value chain.<sup>167</sup> This form of double counting cannot be avoided but can be made more transparent by separately reporting the scope 1, 2, and 3 emissions of loans and investments. Apart from this, double counting can take place at five levels:

- Between financial institutions
- In cofinancing the same entity or activity
- Between transactions within the same financial institutions
- Across different asset classes
- Within the same asset class

PCAF recognizes that double counting of GHG emissions cannot be avoided completely; however, it should be minimized. Double counting between cofinancing institutions and between transactions within the same asset class of a financial institution are avoided by using the appropriate attribution rules defined by PCAF consistently.

By using the correct attribution method, double counting of emissions between institutions can be minimized. Financial institutions using the methodologies in the Standard will be subject to the same exposure to double counting so that one financial institution will not be more significantly burdened than another.

**Avoided emissions and emissions removals<sup>168</sup>**

- In addition to absolute emissions, financial institutions:
  - **Should** report carbon removals where relevant to their loans and investments when appropriate methodologies become available.
  - **May** report avoided emissions of their renewable power projects.
- If financial institutions choose to disclose carbon removals or avoided emissions, they **shall** disclose absolute carbon removals or avoided emissions separately from the financial institution's scope 1, scope 2, and scope 3 inventories (see Annex 10-2 for an example).

<sup>167</sup> The scope 1 emissions of one company can be the upstream scope 2 or 3 emissions of its customer. For example, scope 1 emissions from a utility providing energy to a company would end up in the scope 2 inventory of that company. If both companies are receiving funding from the same financial institution these emissions would be double counted within its inventory.

<sup>168</sup> As defined in Chapter 3, removed emissions are those related to projects or technologies that can result in CO<sub>2</sub> being sequestered by trees or removed from the atmosphere and stored in solid or liquid form.

## Emissions intensity

- Financial institutions **should** report economic emission intensities if these values are relevant to their business goals.
- Economic emission intensities **shall** be expressed on a portfolio, asset class, or sector level in metric tonnes of carbon dioxide equivalents per million euro or dollar invested or loaned: tCO<sub>2</sub>e/M€ or tCO<sub>2</sub>e/M\$.
- When relevant to their business goals, financial institutions **should** consider reporting physical emission intensities per sector using sector-specific activity (e.g., tCO<sub>2</sub>e/m<sup>2</sup> for real estate, tCO<sub>2</sub>e/MWh for power utilities, tCO<sub>2</sub>e/tonne of steel produced for steel companies).

### Box 7. Financed emission metrics and comparability

Measuring financed emissions in absolute terms (i.e., absolute emissions) provides financial institutions with the necessary baseline for climate action to align with the Paris Agreement. When banks and investors aim to benchmark or compare companies, sectors, or portfolios to each other, normalization is required. Absolute financed emissions at a portfolio level is not a good instrument to compare or benchmark financial institutions on their performance due to the potential differences between financial institutions in terms of size, product portfolio, exposure to sectors and regions, etc. For comparability and benchmarking, the absolute financed emissions need to be translated into an emissions intensity metric (emissions per a specific unit).<sup>169</sup>

A wide array of intensity metrics is applied in the market and each has its own merits. The table below includes a list of the most common metrics.

Metric	Purpose	Description
<b>Absolute emissions</b>	To understand the climate impact of loans and investments, and set a baseline for climate action	The total GHG emissions of an asset class or portfolio
<b>Economic emissions intensity</b>	To understand how the emissions intensity of different portfolios (or parts of portfolios) compare to each other per monetary unit	Absolute emissions divided by the loan and investment volume, expressed as e.g. tCO <sub>2</sub> e/€M invested
<b>Physical emissions intensity</b>	To understand the efficiency of a portfolio (or parts of a portfolio) in terms of total carbon emissions per unit of a common output	Absolute emissions divided by an output value, expressed as e.g. tCO <sub>2</sub> e/MWh, tCO <sub>2</sub> e/ton product produced
<b>Weighted Average Carbon Intensity (WACI)</b>	To understand exposure to carbon-intensive companies	Portfolio's exposure to carbon-intensive companies, expressed as tCO <sub>2</sub> e/€M company revenue

<sup>169</sup> Actual performance benchmarking or target setting for financial institutions is not covered by this Standard. For this type of assessment, other initiatives (e.g., the SBTi or Center for Climate-Aligned Finance) exist that build on the accounting requirements set forth in this Standard but that further rely on their own methodologies and approaches.

## Data and data quality

- Financial institutions **shall** use the most recent or otherwise appropriate data available to them. PCAF recognizes there is often a lag between financial reporting and required emissions data, such as emission factors or borrower or investee emissions data. In these instances, it is acceptable that the data represents different years.
- Financial institutions **should** provide a description of the types and sources of data—including activity data, assumptions, emission factors, and all relevant publication dates—used to calculate emissions. Descriptions **should** be written to create transparency.
- Financial institutions **should** publish a weighted score by outstanding amount of the data quality of reported emissions data or **should** explain why they are unable to do so. An example is provided in Box 8.
- Where financial institutions are reporting scope 3 emissions, the weighted data quality score **shall** be reported separately from scopes 1 and 2.
- The data hierarchy tables provided in each asset class method in Chapter 5 **should** be used as a guide for disclosing data quality. Financial institutions **should** explain how data quality is assessed, acknowledging that it will improve over time.
- Over time and where possible, data should be verified to at least a level of limited assurance. Financial institutions **should** disclose whether data is verified and to what level.

**Box 8. An illustrative example for calculating weighted data quality scores**

It is likely that data quality will differ across asset classes, sectors, companies, and emission scopes. To disclose the best representation of data quality, the Standard requires that financial institutions normalize the data quality scores for each asset class and sector to the total outstanding loan or investment amount.

The equation for calculating weighed averages for an asset class or sector is:

$$= \frac{\sum_{i=1}^n \text{Outstanding amount}_i \times \text{Data quality score}_i}{\sum_{i=1}^n \text{Outstanding amount}_i}$$

with  $i$  = borrower or investee

An illustrative example of a financial institution's lending is provided below:

Asset class	Sector	Company	Outstanding loan	Attributed scope 1 and 2 absolute emissions (kton CO <sub>2</sub> e)	Data quality score (1=high, 5=low)
Business loans	Oil & Gas	Company A	522,425	15	3
Business loans	Oil & Gas	Company B	187,449	7	5
Business loans	Cattle farming	Company C	82,778	8	1
Business loans	Cattle farming	Company D	108,997	11	1
Business loans	Cattle farming	Company E	67,556	7	2
Business loans	Cattle farming	Company F	54,762	5	5

**Weighted data score for business loans scope 1 and 2 emissions:**

$$\frac{((522,425 \times 3) + (187,449 \times 5) + (82,778 \times 1) + (108,997 \times 1) + (67,556 \times 2) + (54,762 \times 5))}{((522,425 + 187,449 + 82,778 + 108,997 + 67,556 + 54,762))}$$

**=3.03**

**Weighted data score for oil & gas sector scope 1 and 2 emissions:**

$$\frac{((522,425 \times 3) + (187,449 \times 5))}{((522,425 + 187,449))}$$

**=3.53**





## 7. Glossary



<b>Absolute emissions</b>	Emissions attributed to a financial institution's lending and investing activity. Expressed in tonnes CO <sub>2</sub> e.
<b>Asset class</b>	A group of financial instruments that have similar financial characteristics.
<b>Attribution factor</b>	The share of total greenhouse gas (GHG) emissions of the borrower or investee that are allocated to the loan or investments.
<b>Avoided emissions</b>	Emission reductions that the financed project produces versus what would have been emitted in the absence of the project (the baseline emissions). In the context of the Standard, avoided emissions are only from renewable energy and energy efficiency projects.
<b>Biogenic carbon dioxide (CO<sub>2</sub>) emissions</b>	Emissions from a stationary source directly resulting from the combustion or decomposition of biologically based materials other than fossil fuels.
<b>Borrower</b>	A person or company that borrows money from a bank.
<b>Business loan</b>	Loans and lines of credit for general corporate purposes (i.e., with unknown use of proceeds as defined by the GHG Protocol) to businesses, nonprofits, and any other structure of organization that are not traded on a market and are on the balance sheet of the financial institution. For detail information on this asset class see subchapter 5.2.
<b>Climate impact</b>	In the context of this Standard, climate impact refers to the emissions financed by loans and investments.
<b>Climate risk</b>	The potential for adverse effects on lives, livelihoods, health status, economic, social and cultural assets, services (including environmental), and infrastructure due to climate change.
<b>CO<sub>2</sub>-equivalent (CO<sub>2</sub>e)</b>	The amount of CO <sub>2</sub> that would cause the same integrated radiative forcing (a measure for the strength of climate change drivers) over a given time horizon as an emitted amount of another GHG or mixture of GHGs. Conversion factors vary based on the underlying assumptions and as the science advances. As a baseline, PCAF recommends using 100-year Global Warming Potentials without climate-carbon feedback from the most recent IPCC Assessment report.
<b>Commercial real estate (CRE)</b>	This asset class includes on-balance sheet loans for specific corporate purposes, namely the purchase and refinance of CRE, and on-balance sheet investments in CRE. This definition implies that the property is used for commercial purposes, such as retail, hotels, office space, industrial, or large multifamily rentals. In all cases, the building owner or investor leases the property to tenants to conduct income-generating activities. For detailed information on this asset class see subchapter 5.4.
<b>Consolidation approach</b>	Refers to how an organization sets boundaries for GHG accounting. Types include equity approach, financial control, and operational control.
<b>Consumer finance</b>	Finance provided to individual and household consumers, such as mortgages and motor vehicle loans.
<b>Corporate debt</b>	Money that is owed by companies rather than by governments or individual people.
<b>Debt</b>	A financing instrument that requires repayment by the borrower.
<b>Direct emissions</b>	Emissions from sources that are owned or controlled by the reporting entity or the borrower or investee.
<b>Double counting</b>	Occurs when GHG emissions (generated, avoided, or removed) are counted more than once in a GHG inventory or toward attaining mitigation pledges or financial pledges for the purpose of mitigating climate change.
<b>Embodied emissions in buildings</b>	The GHG emissions associated with the non-operational phase of the project. This includes emissions cause by extraction, manufacture, transportation, assembly, maintenance, replacement, deconstruction, disposal and end of life aspects of the materials and systems that make up a building.

<b>Emission intensity metric</b>	Emissions per a specific unit, for example: tCO <sub>2</sub> e/€M invested, tCO <sub>2</sub> e/MWh, tCO <sub>2</sub> e/ton product produced, tCO <sub>2</sub> e/MWh, tCO <sub>2</sub> e/ton product produced, tCO <sub>2</sub> e/€M company revenue.
<b>Emission removal</b>	The action of removing GHG emissions from the atmosphere and store it through various means, such as in soils, trees, underground reservoirs, rocks, the ocean, and even products like concrete and carbon fiber.
<b>Emission scopes</b>	The GHG Protocol Corporate Accounting and Reporting Standard classifies an organization's GHG emissions into three scopes. Scope 1 emissions are direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of purchased energy. Scope 3 emissions are all indirect emissions (not included in scope 2) that occur in the value chain of the reporting organization, including both upstream and downstream emissions.
<b>Enterprise Value Including Cash (EVIC)</b>	The sum of the market capitalization of ordinary shares at fiscal year end, the market capitalization of preferred shares at fiscal year-end, and the book values of total debt and minorities' interests. No deductions of cash or cash equivalents are made to avoid the possibility of negative enterprise values.
<b>Environmentally extended input-output (EEIO) data</b>	EEIO data refers to EEIO emission factors that can be used to estimate scope 1, 2, and upstream scope 3 GHG emissions for a given industry or product category. EEIO data is particularly useful in screening emissions sources when prioritizing data collection efforts.
<b>Equity</b>	Bank's or investor's ownership in a company or project. There are various types of equity, but equity typically refers to shareholder equity, which represents the amount of money that would be returned to a company's shareholders if all of the assets were liquidated and all of the company's debt were paid off.
<b>EXIOBASE</b>	A global, detailed multi-regional environmentally extended supply-use table and input-output table. It was developed by harmonizing and detailing supply use tables for a large number of countries, estimating emissions, and resource extractions by industry.
<b>Federal Test Procedure</b>	The US Environmental Protection Agency's Federal Test Procedures are a series of drive cycle tests to measure the tailpipe emissions and fuel efficiency of passenger cars.
<b>Financed emissions</b>	Absolute emissions that banks and investors finance through their loans and investments.
<b>Financial institutions</b>	A company engaged in the business of dealing with financial and monetary transactions such as deposits, loans, investments, and currency exchange. Financial institutions encompass a broad range of business operations within the financial services sector including: commercial banks, investment banks, development banks, asset owners/managers (mutual funds, pension funds, close-end funds, investment trusts), and insurance companies.
<b>Greenhouse gas (GHG) emissions</b>	The seven gases mandated under the Kyoto Protocol and to be included in national inventories under the United Nations Framework Convention on Climate Change (UNFCCC)—carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF <sub>6</sub> ), and nitrogen trifluoride (NF <sub>3</sub> ).
<b>GHG accounting</b>	A means of measuring the direct and indirect emissions to the Earth's biosphere of CO <sub>2</sub> and its equivalent gases from industrial activities.
<b>GHG accounting of financial portfolios</b>	The annual accounting and disclosure of GHG emissions associated with loans and investments at a fixed point in time in line with financial accounting periods. This is also called portfolio GHG accounting.
<b>GHG Protocol</b>	Comprehensive global standardized frameworks to measure and manage GHG emissions from private and public sector operations, value chains, and mitigation actions. The GHG Protocol supplies the world's most widely used GHG accounting standards. The Corporate Accounting and Reporting Standard provides the accounting platform for virtually every corporate GHG reporting program in the world.

<b>Global Trade Analysis Project (GTAP) database</b>	GTAP is a global network of researchers and policy makers conducting quantitative analysis of international policy issues. GTAP is coordinated by the Center for Global Trade Analysis in Purdue University's Department of Agricultural Economics. The centerpiece of the GTAP is a global database describing bilateral trade patterns, production, consumption, and intermediate use of commodities and services
<b>Home equity line of credit (HELOC)</b>	A revolving line of credit usually with an adjustable interest rate, which allows homeowners to borrow up to a certain amount over a period of time. HELOCs work in a manner similar to credit cards, where the homeowner can continuously borrow up to an approved limit while paying off the balance.
<b>Home equity loan (HEL)</b>	Sometimes referred to as a second mortgage, usually allows homeowners to borrow a lump sum against their current home equity for a fixed rate over a fixed period of time. Usually, home equity loans are used to finance large expenditures, such as home repairs or college tuition.
<b>Indirect emissions</b>	Emissions that are a consequence of the activities of the reporting entity but occur at sources owned or controlled by another entity.
<b>Investment</b>	The term investment (unless explicitly stated otherwise) is used in the broad sense: "Putting money into activities or organizations' with the expectation of making a profit." Most forms of investment involve some form of risk taking, such as investment in equities, debt, property, projects, and even fixed interest securities which are subject to inflation risk, among other risks.
<b>Investee company or investee project</b>	A company or project in which an investor makes a direct investment.
<b>Known use of proceeds</b>	Known use of proceeds relates to investments and loans for specific (corporate or consumer) purposes (i.e., the financial institution knows for what activity the money is used).
<b>Listed equity and corporate bonds</b>	This asset class includes all listed corporate bonds and all listed equity for general corporate purposes (i.e., unknown use of proceeds as defined by the GHG Protocol) that are traded on a market and are on the balance sheet of the financial institution. For detailed information on this asset class see subchapter 5.1.
<b>Mortgage</b>	This asset class includes on-balance sheet loans for specific consumer purposes—namely the purchase and refinance of residential property, including individual homes and multi-family housing with a small number of units. This definition implies that the property is used only for residential purposes and not to conduct income-generating activities. For detailed information on this asset class see subchapter 5.5.
<b>Motor vehicle loan</b>	This asset class refers to loans and lines of credit for specific (corporate or consumer) purposes (i.e., with known use of proceeds as defined by the GHG Protocol) to businesses and consumers that are used to finance one or several motor vehicles on the balance sheet of the financial institution. For detailed information on this asset class see subchapter 5.6.
<b>Paris Agreement</b>	The Paris Agreement, adopted within the UNFCCC in December 2015, commits participating countries to limit global temperature rise to well-below 2°C above preindustrial levels and pursue efforts to limit warming to 1.5°C, adapt to changes already occurring, and regularly increase efforts over time.
<b>Project finance</b>	This asset class includes all loans or equities to projects for specific purposes (i.e., with known use of proceeds as defined by the GHG Protocol) that are on the balance sheet of the financial institution. The financing is designated for a defined activity or set of activities, such as the construction and operation of a gas-fired power plant, a wind or solar project, or energy efficiency projects. For detailed information on this asset class see subchapter 5.3.
<b>Scenario analysis</b>	A process of analyzing future events by considering alternative possible outcomes.

<b>Science-based reduction targets (SBTs)</b>	Targets adopted by companies to reduce GHG emissions are considered science-based if they are in line with what the latest climate science says is necessary to meet the goals of the Paris Agreement—to limit global warming to well-below 2°C above preindustrial levels and pursue efforts to limit warming to 1.5°C.
<b>Scope 1 emissions</b>	Direct GHG emissions that occur from sources owned or controlled by the reporting company—i.e., emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.
<b>Scope 2 emissions</b>	Indirect GHG emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the reporting company. Scope 2 emissions physically occur at the facility where the electricity, steam, heating, or cooling is generated.
<b>Scope 3 emissions</b>	All other indirect GHG emissions (not included in Scope 2) that occur in the value chain of the reporting company. Scope 3 can be broken down into upstream emissions that occur in the supply chain (for example, from production or extraction of purchased materials) and downstream emissions that occur as a consequence of using the organization's products or services.
<b>Scope 3 category 15 (investments) emissions</b>	This category includes scope 3 emissions associated with the reporting company's loans and investments in the reporting year, not already included in scope 1 or scope 2.
<b>Sequestered emissions</b>	Refers to atmospheric CO <sub>2</sub> emissions that are captured and stored in solid or liquid form, thereby removing their harmful global warming effect.
<b>Total balance sheet value</b>	A balance sheet is a financial statement that reports a company's assets, liabilities, and shareholders' equity. The balance sheet value refers to the sum of total equity and liabilities, which is equal to the company's total assets.
<b>Unknown use of proceeds</b>	Unknown use of proceeds refers to investments and loans for general (corporate or consumer) purposes (i.e., the financial institution does not know exactly for what activity the money is used, which holds for general purposes loans).
<b>Unlisted equity</b>	All equity investments for general corporate purposes (i.e., with unknown use of proceeds as defined by the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard) to businesses, nonprofits, and any other structure of organization that are not traded on a market and are on the balance sheet of the financial institution. Unlisted equity is also referred to as equity investments in private companies (i.e., the financial institute obtains shares of the company).
<b>Vehicle make</b>	The name of the company that manufactures the vehicle.
<b>Vehicle model</b>	The product name of the vehicle.
<b>World Input-Output Database (WIOD)</b>	World Input-Output tables and underlying data, covering 43 countries, and a model for the rest of the world for 2000-2014. Data for 56 sectors are classified according to the International Standard Industrial Classification revision 4 (ISIC REV. 4).
<b>World Harmonized Light-duty Vehicles Test Procedure (WLTP)</b>	The WLTP is a global, harmonized standard of drive cycle tests to determine the tailpipe emissions and fuel efficiency of passenger cars.





## 8. Acronyms

<b>CDP</b>	Carbon Disclosure Project
<b>CH<sub>4</sub></b>	Methane
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>CO<sub>2</sub>e</b>	Carbon dioxide equivalent
<b>CRE</b>	Commercial real estate
<b>EEIO</b>	Environmentally extended input-output
<b>EU</b>	European Union
<b>EU TEG</b>	European Commission Technical Expert Group on Sustainable Finance
<b>EV</b>	Electric vehicle
<b>EVIC</b>	Enterprise value including cash
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FSB</b>	Financial Stability Board
<b>GAAP</b>	Generally accepted accounting principles
<b>GEMIS</b>	Global Emissions Model for integrated Systems
<b>GHG</b>	Greenhouse gas
<b>GTAP</b>	Global Trade Analysis Project
<b>HFC</b>	Hydrofluorocarbon
<b>HEL</b>	Home equity loan
<b>HELOC</b>	Home equity line of credit
<b>ICCT</b>	International Council on Clean Transportation
<b>IEA</b>	International Energy Agency
<b>IFI</b>	Internal Financial Institution
<b>IFRS</b>	International Financial Reporting Standards
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IPO</b>	Initial public offering
<b>ISIC</b>	Industrial Classification of All Economic Activities
<b>ITF OECD</b>	International Transport Forum at the Organisation for Economic Co-operation and Development
<b>ktCO<sub>2</sub>e</b>	kilotonnes of carbon dioxide equivalent
<b>L2</b>	Level 2 (NACE)
<b>MtCO<sub>2</sub>e</b>	megatonnes of carbon dioxide equivalent
<b>MWh</b>	Megawatt-hour
<b>N<sub>2</sub>O</b>	Nitrous oxide
<b>NACE</b>	Statistical Classification of Economic Activities in the European Community
<b>NDC</b>	Nationally determined contribution
<b>NEDC</b>	New European Driving Cycle
<b>NF<sub>3</sub></b>	Nitrogen trifluoride
<b>NGO</b>	Nongovernmental organization
<b>PCAF</b>	Partnership for Carbon Accounting Financials
<b>PFC</b>	Perfluorocarbon
<b>SASB</b>	Sustainability Accounting Standards Board
<b>SBT</b>	Science-based targets
<b>SBTi-FI</b>	Science -Based Targets initiative for Financial Institutions
<b>SDA</b>	Sectoral Decarbonization Approach
<b>SF<sub>6</sub></b>	Sulphur hexafluoride

<b>TCFD</b>	Task Force on Climate-related Financial Disclosures
<b>tCO<sub>2</sub>e</b>	Metric tonnes of carbon dioxide equivalent
<b>UNEP FI</b>	United Nations Environment Programme Finance Initiative
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>US</b>	United States
<b>WACI</b>	Weighted Average Carbon Intensity
<b>WBCSD</b>	World Business Council for Sustainable Development
<b>WIOD</b>	World Input-Output Database
<b>WLTP</b>	Worldwide Harmonized Light Vehicles Test Procedure



The background is a dark, moody composition featuring vibrant green and yellow light trails that sweep across the frame from the bottom left towards the top right. These trails have a granular, pixelated texture, suggesting motion or data flow. In the upper left corner, a portion of a white pen nib is visible, pointing downwards. The overall aesthetic is modern and technological.

## 9. References

- CDP. (2020). CDP Climate Change 2020 Questionnaire. Retrieved from CDP: <https://bit.ly/39d9zoE>
- CRO Forum. (2020). Carbon Footprinting Methodology for Underwriting Portfolios. Retrieved from The CRO Forum: <https://www.thecroforum.org/wp-content/uploads/2020/05/CRO-Carbon-Foot-Printing-Methodology.pdf>
- ENCORD. (2012). Construction CO<sub>2</sub>e Measurement Protocol: A Guide to reporting against the Green House Gas Protocol for construction companies. Retrieved from Greenhouse Gas Protocol: [https://ghgprotocol.org/sites/default/files/ENCORD-Construction-CO2-Measurement-Protocol-Lo-Res\\_FINAL\\_0.pdf](https://ghgprotocol.org/sites/default/files/ENCORD-Construction-CO2-Measurement-Protocol-Lo-Res_FINAL_0.pdf)
- EU Technical Expert Group on Sustainable Finance. (2019). Financing a Sustainable European Economy: Report on Benchmarks: Handbook of Climate Transition Benchmarks, Paris Aligned Benchmark, and Benchmarks' ESG Disclosure. Retrieved from European Commission: [https://ec.europa.eu/info/sites/info/files/business\\_economy\\_euro/banking\\_and\\_finance/documents/192020-sustainable-finance-teg-benchmarks-handbook\\_en\\_0.pdf](https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/192020-sustainable-finance-teg-benchmarks-handbook_en_0.pdf)
- GHG Protocol. (2014). Global Warming Potential Values. Retrieved from The Greenhouse Gas Protocol: [https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29\\_1.pdf](https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf)
- IFI. (2020). Methodological Approach for the Common Default Grid Emission Factor Dataset. Retrieved from United Nations Framework Convention on Climate Change: [https://unfccc.int/sites/default/files/resource/IFITWG\\_Methodological\\_approach\\_to\\_common\\_dataset.pdf](https://unfccc.int/sites/default/files/resource/IFITWG_Methodological_approach_to_common_dataset.pdf)
- New Climate Institute and Climate Analytics. (2020). Climate Action Tracker. Retrieved from <https://climateactiontracker.org/global/cat-thermometer/>
- PCAF. (2019, December). Accounting for and Steering Carbon: Harmonised Approach for the Financial Sector. Retrieved from Partnership for Carbon Accounting Financials: <https://carbonaccountingfinancials.com/files/downloads/1911-pcaf-report-nl.pdf?6253ce57ac>
- PCAF. (2019, November). Harmonizing and Implementing a Carbon Accounting Approach for the Financial Sector in North America. Retrieved from Partnership for Carbon Accounting Financials: <https://carbonaccountingfinancials.com/files/2019-10/20191028-pcaf-report-2019.pdf>
- PCAF. (2019). Shaping the climate action journey for financial institutions: navigating through the cluster of climate initiatives. Retrieved from Partnership for Carbon Accounting Financials: <https://carbonaccountingfinancials.com/files/2020-01/overview-initiatives-shaping-climate-action-journey-for-fis.pdf?ae36ae7be6>
- SBTi. (2020). Financial Sector Science-Based Targets Guidance, Pilot Version. Retrieved from <https://sciencebasedtargets.org/wp-content/uploads/2020/10/Financial-Sector-Science-Based-Targets-Guidance-Pilot-Version.pdf>
- TCFD. (2017). Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures. Retrieved from <https://www.fsb-tcfd.org/publications/final-recommendations-report/>
- TCFD. (2017). Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures. Section D: Supplemental Guidance for the Financial Sector. Retrieved from Task Force on Climate-related Financial Disclosures: <https://www.fsb-tcfd.org/wp-content/uploads/2017/12/FINAL-TCFD-Annex-Amended-121517.pdf>



- UNFCCC. (2015). International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting. Retrieved from United Nations Framework Convention on Climate Change: [https://unfccc.int/sites/default/files/resource/International%20Financial%20Institution%20Framework%20for%20a%20Harmonised\\_rev.pdf](https://unfccc.int/sites/default/files/resource/International%20Financial%20Institution%20Framework%20for%20a%20Harmonised_rev.pdf)
- World Bank Group. (2020). State and Trends of Carbon Pricing. Washington, D.C.
- WRI and WBCSD. (2004). GHG Protocol Corporate Accounting and Reporting Standard, Revised Edition, Chapter 2. Retrieved from The Greenhouse Gas Protocol: <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>
- WRI and WBCSD. (2011). GHG Protocol, Corporate Value Chain (Scope 3) Accounting and Reporting Standard, Supplement to the GHG Protocol Corporate Accounting and Reporting Standard. Retrieved from Greenhouse Gas Protocol: [https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard\\_041613\\_2.pdf](https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf)
- WRI and WBCSD. (2013). Technical Guidance for Calculating Scope 3 Emissions. Retrieved from Greenhouse Gas Protocol: [https://ghgprotocol.org/sites/default/files/standards/Scope3\\_Calculation\\_Guidance\\_0.pdf](https://ghgprotocol.org/sites/default/files/standards/Scope3_Calculation_Guidance_0.pdf)

# 10. Annex



## 10. Annex

### 10.1. Detailed data quality score tables per asset class

#### LISTED EQUITY AND CORPORATE BONDS – DETAILED SUMMARY OF DATA NEEDS AND EQUATIONS TO CALCULATE FINANCED EMISSIONS

Table 10.1-1. Detailed description of the data quality score table for listed equity and corporate bonds<sup>170</sup>

Option	Description				Data quality
	Attribution		Emission factor	Financed emissions calculation	Highest to lowest
	Financial data		Emission data	Equations	
<b>Option 1a</b>	Outstanding amount in the company	EVIC for listed companies and total equity plus debt for bonds to private companies	Verified GHG emissions data from the company in accordance with the GHG Protocol	<p><b>For listed companies:</b></p> $\sum_c \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{Verified company emissions}_c$ <p><b>For bonds to private companies:</b></p> $\sum_c \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c} \times \text{Verified company emissions}_c$	<b>Score 1</b>
<b>Option 1b</b>			Unverified GHG emissions data calculated by the company in accordance with the GHG Protocol	<p><b>For listed companies:</b></p> $\sum_c \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{Unverified company emissions}_c$ <p><b>For bonds to private companies:</b></p> $\sum_c \frac{\text{Outstanding amount}_c}{\text{Total equity} + \text{debt}_c} \times \text{Unverified company emissions}_c$	<b>Score 2</b>

<sup>170</sup> Where c = borrower or investee company and s = sector.

Option	Description					Data quality
	Attribution		Emission factor		Financed emissions calculation	Highest to lowest
	Financial data		Emission data		Equations	
<b>Option 2a<sup>171</sup></b>			Primary physical activity data for the company's energy consumption by energy source (e.g., megawatt-hours of electricity) plus any process emissions	Emission factors specific to that primary data (e.g., energy source-specific emission factors) <sup>172</sup>	<p><b>For listed companies:</b></p> $\sum_c \frac{Outstanding\ amount_c}{EVIC_c} \times Energy\ consumption_c^{173} \times Emission\ factor$ <p><b>For bonds to private companies:</b></p> $\sum_c \frac{Outstanding\ amount_c}{Total\ equity + debt_c} \times Energy\ consumption_c^{174} \times Emission\ factor$	
<b>Option 2b</b>			Primary physical activity data for the company's production (e.g., tons of rice produced)	Emission factors specific to that primary data (e.g., emission factor per ton of rice)	<p><b>For listed companies:</b></p> $\sum_c \frac{Outstanding\ amount_c}{EVIC_c} \times Production_c \times Emission\ factor$ <p><b>For bonds to private companies:</b></p> $\sum_c \frac{Outstanding\ amount_c}{Total\ equity + debt_c} \times Production_c \times Emission\ factor$	<b>Score 3</b>
<b>Option 3a</b>		EVIC for listed companies and total equity plus debt for bonds to	GHG emissions per sector	Revenue per sector <sup>175</sup>	<p><b>For listed companies:</b></p> $\sum_c \frac{Outstanding\ amount_c}{EVIC_c} \times Revenue_c \times \frac{GHG\ emissions_s}{Turnover_s}$ <p><b>For bonds to private companies:</b></p> $\sum_c \frac{Outstanding\ amount_c}{Total\ equity + debt_c} \times Revenue_c \times \frac{GHG\ emissions_s}{Turnover_s}$	<b>Score 4</b>

<sup>171</sup> The quality scoring for Option 2a is only possible for/applicable to scope 1 and scope 2 emissions as scope 3 emissions cannot be estimated by this option. Other options can be used to estimate the scope 3 emissions, however.

<sup>172</sup> Supplier-specific emission factors (e.g., from an electricity provider) for the respective primary activity data are always preferred over non-supplier-specific emission factors.

<sup>173</sup> Where this option is used, process emissions must be added to the calculated energy consumption emissions before multiplying by the attribution factor.

<sup>174</sup> Where this option is used, process emissions must be added to the calculated energy consumption emissions before multiplying by the attribution factor.

<sup>175</sup> If revenue is not deemed a suitable financial indicator for estimating the emissions of a company in a certain sector, one can apply other suitable financial indicators as a proxy. If an alternative indicator is used, the reasoning for the selection of this alternative indicator should be made transparent. The data quality score will not be affected.

Option	Description					Data quality
	Attribution		Emission factor		Financed emissions calculation	Highest to lowest
	Financial data		Emission data		Equations	
		private companies				
		Revenue of the company				
Option 3b		N/A	GHG emissions per sector	Assets per sector	<b>For listed companies and bonds to private companies:</b> $\sum_c Outstanding\ amount_c \times \frac{GHG\ emissions_s}{Assets_s}$	Score 5
Option 3c		Asset turnover ratio per sector	GHG emissions per sector	Revenue per sector	<b>For listed companies and bonds to private companies:</b> $\sum_c Outstanding\ amount_c \times Asset\ turnover\ ratio_s \times \frac{GHG\ emissions_s}{Revenue_s}$	



**BUSINESS LOANS AND UNLISTED EQUITY – DETAILED SUMMARY OF DATA NEEDS AND EQUATIONS TO CALCULATE FINANCED EMISSIONS**Table 10.1-2. Detailed description of the data quality score table for business loans and unlisted equity<sup>176</sup>

Option	Description					Data quality
	Attribution		Emission factor		Financed emissions calculation	Highest to lowest
	Financial data		Emission data		Equations	
Option 1a	Outstanding amount in the company	Total equity plus debt for business loans and equity investments to/in private companies, and EVIC for business loans to listed companies	Verified GHG emissions data from the company in accordance with the GHG Protocol		<b>For business loans and equity investments to/in private companies:</b> $\sum_c \frac{Outstanding\ amount_c}{Total\ equity + debt_c} \times Verified\ company\ emissions_c$ <b>For business loans to listed companies:</b> $\sum_c \frac{Outstanding\ amount_c}{EVIC_c} \times Verified\ company\ emissions_c$	Score 1
Option 1b			Unverified GHG emissions data calculated by the company in accordance with the GHG Protocol		<b>For business loans and equity investments to/in private companies:</b> $\sum_c \frac{Outstanding\ amount_c}{Total\ equity + debt_c} \times Unverified\ company\ emissions_c$ <b>For business loans to listed companies:</b> $\sum_c \frac{Outstanding\ amount_c}{EVIC_c} \times Unverified\ company\ emissions_c$	Score 2
Option 2a <sup>177</sup>			Primary physical activity data for the company’s energy consumption by energy source (e.g., megawatt-	Emission factors specific to that primary data (e.g., energy source-specific emission factors) <sup>178</sup>	<b>For business loans and equity investments to/in private companies:</b> $\sum_c \frac{Outstanding\ amount_c}{Total\ equity + debt_c} \times Energy\ consumption_c^{179} \times Emission\ factor$ <b>For business loans to listed companies:</b> $\sum_c \frac{Outstanding\ amount_c}{EVIC_c} \times Energy\ consumption_c^{180} \times Emission\ factor$	

<sup>176</sup> Where c = borrower or investee company and s = sector.<sup>177</sup> The quality scoring for Option 2a is only possible for/applicable to scope 1 and scope 2 emissions as scope 3 emissions cannot be estimated by this option. Other options can be used to estimate the scope 3 emissions, however.<sup>178</sup> Supplier-specific emission factors (e.g., from an electricity provider) for the respective primary activity data are always preferred over non-supplier-specific emission factors.<sup>179</sup> Where this option is used, process emissions must be added to the calculated energy consumption emissions before multiplying by the attribution factor.<sup>180</sup> Where this option is used, process emissions must be added to the calculated energy consumption emissions before multiplying by the attribution factor.

Option	Description					Data quality
	Attribution		Emission factor		Financed emissions calculation	Highest to lowest
	Financial data		Emission data		Equations	
			hours of electricity) plus any process emissions			
Option 2b			Primary physical activity data for the company's production (e.g., tons of rice produced)	Emission factors specific to that primary data (e.g., emission factor per ton of rice)	<p><b>For business loans and equity investments to/in private companies:</b></p> $\sum_c \frac{Outstanding\ amount_c}{Total\ equity + debt_c} \times Production_c \times Emission\ factor$ <p><b>For business loans to listed companies:</b></p> $\sum_c \frac{Outstanding\ amount_c}{EVIC_c} \times Production_c \times Emission\ factor$	Score 3
Option 3a		Total equity plus debt for business loans and equity investments to/in private companies, and EVIC for business loans to listed companies Revenue of the company	GHG emissions per sector	Revenue per sector <sup>181</sup>	<p><b>For business loans and equity investments to/in private companies:</b></p> $\sum_c \frac{Outstanding\ amount_c}{Total\ equity + debt_c} \times Revenue_c \times \frac{GHG\ emissions_s}{Revenue_s}$ <p><b>For business loans to listed companies:</b></p> $\sum_c \frac{Outstanding\ amount_c}{EVIC_c} \times Revenue_c \times \frac{GHG\ emissions_s}{Revenue_s}$	Score 4

<sup>181</sup> If revenue is not deemed a suitable financial indicator for estimating the emissions of a company in a certain sector, one can apply other suitable financial indicators as a proxy. If an alternative indicator is used, the reasoning for the selection of this alternative indicator should be made transparent. The data quality score will not be affected.

Option	Description					Data quality
	Attribution		Emission factor		Financed emissions calculation	Highest to lowest
	Financial data		Emission data		Equations	
Option 3b		N/A	GHG emissions per sector	Assets per sector	$\sum_c Outstanding\ amount_c \times \frac{GHG\ emissions_s}{Assets_s}$	Score 5
Option 3c		Asset turnover ratio per sector	GHG emissions per sector	Revenue per sector	$\sum_c Outstanding\ amount_c \times Asset\ turnover\ ratio_s \times \frac{GHG\ emissions_s}{Revenue_s}$	

**PROJECT FINANCE – DETAILED SUMMARY OF DATA NEEDS AND EQUATIONS TO CALCULATE FINANCED EMISSIONS**Table 10.1-3. Detailed description of the data quality score table for project finance<sup>182</sup>

Option	Description				Data quality	
	Attribution		Emission factor		Financed emissions calculation	Highest to lowest
	Financial data		Emission data			
Option 1a	Outstanding amount in project	Total project equity and debt	Verified GHG emissions data of the project in accordance with the GHG Protocol		$\sum_p \frac{Outstanding\ amount_p}{Total\ equity + debt_p} \times Verified\ project\ emissions_p$	Score 1
Option 1b			Unverified GHG emissions data calculated by the project in accordance with the GHG Protocol		$\sum_p \frac{Outstanding\ amount_p}{Total\ equity + debt_p} \times Unverified\ project\ emissions_p$	Score 2
Option 2a <sup>183</sup>			Primary physical activity data for the project’s energy consumption by energy source (e.g., megawatt-hours of electricity) plus any process emissions	Emission factors specific to that primary data (e.g., energy source-specific emission factors) <sup>184</sup>	$\sum_p \frac{Outstanding\ amount_p}{Total\ equity + debt_p} \times Energy\ consumption_p^{185} \times Emission\ factor$	

<sup>182</sup> Where c = borrower or investee company and s = sector.<sup>183</sup> The quality scoring for Option 2a is only possible for/applicable to scope 1 and scope 2 emissions as scope 3 emissions cannot be estimated by this option. Other options can be used to estimate the scope 3 emissions, however.<sup>184</sup> Supplier-specific emission factors (e.g., from electricity provider) for the respective primary activity data are always preferred over non-supplier-specific emission factors.<sup>185</sup> Where this option is used, process emissions must be added to the calculated energy consumption emissions before multiplying by the attribution factor.

Option	Description					Data quality
	Attribution		Emission factor		Financed emissions calculation	Highest to lowest
	Financial data		Emission data		Equations	
Option 2b			Primary physical activity data for the project's production (e.g., tons of rice produced)	Emission factors specific to that primary data (e.g., emission factor per ton of rice)	$\sum_p \frac{Outstanding\ amount_p}{Total\ equity + debt_p} \times Production_p \times Emission\ factor$	Score 3
Option 3a		Total project equity and debt	GHG emissions per sector	Revenue per sector <sup>186</sup>	$\sum_p \frac{Outstanding\ amount_p}{Total\ equity + debt_p} \times Revenue_p \times \frac{GHG\ emissions_s}{Revenue_s}$	Score 4
		Revenue of the project				
Option 3b		N/A	GHG emissions per sector	Assets per sector	$\sum_p Outstanding\ amount_p \times \frac{GHG\ emissions_s}{Assets_s}$	Score 5
Option 3c		Asset turnover ratio per sector	GHG emissions per sector	Revenue per sector	$\sum_p Outstanding\ amount_p \times Asset\ turnover\ ratio_s \times \frac{GHG\ emissions_s}{Revenue_s}$	

<sup>186</sup> If revenue is not deemed a suitable financial indicator for estimating the emissions of a company in a certain sector, one can apply other suitable financial indicators as a proxy. If an alternative indicator is used, the reasoning for the selection of this alternative indicator should be made transparent. The data quality score will not be affected.



**COMMERCIAL REAL ESTATE – DETAILED SUMMARY OF DATA NEEDS AND EQUATIONS TO CALCULATE FINANCED EMISSIONS**Table 10.1-4. Detailed description of the data quality score table for commercial real estate<sup>187</sup>

Option	Description			Data quality
	Attribution	Emission factor	Financed emissions calculation	
	Financial data	Emissions data	Equations	
<b>Option 1a</b>	Outstanding amount and property value at origination	Supplier-specific emission factors specific to the energy source	Primary data on actual building energy consumption $\sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Actual energy consumption}_{b,e} \times \text{Supplier specific emission factor}_e$	<b>Score 1</b>
<b>Option 1b</b>			Primary data on actual building energy consumption $\sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Actual energy consumption}_{b,e} \times \text{Average emission factor}_e$	<b>Score 2</b>
<b>Option 2a</b>		Average emission factors specific to the energy source	Estimated building energy consumption per floor area based on official building energy labels and floor area financed $\sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Estimated energy consumption from energy labels}_{b,e} \times \text{Floor area}_b \times \text{Average emission factor}_e$	<b>Score 3</b>
<b>Option 2b</b>			Estimated building energy consumption per floor area based on building type and location-specific statistical data and floor area financed $\sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Estimated energy consumption from statistics}_{b,e} \times \text{Floor area}_b \times \text{Average emission factor}_e$	<b>Score 4</b>

<sup>187</sup> Where b = building and e = energy source.

Option		Description		Data quality
	Attribution	Emission factor	Financed emissions calculation	Highest to lowest
	Financial data	Emissions data	Equations	
Option 3		Estimated building energy consumption per building based on building type and location-specific statistical data and number of buildings financed	$\sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Estimated energy consumption from statistics}_{b,e}$ $\times \text{Number of buildings}_b \times \text{Average emission factor}_e$	Score 5

**MORTGAGES – DETAILED SUMMARY OF DATA NEEDS AND EQUATIONS TO CALCULATE FINANCED EMISSIONS**Table 10.1-5. Detailed description of the data quality score table for mortgages<sup>188</sup>

Option	Description				Data quality
	Attribution	Emission factor		Financed emissions calculation	Highest to lowest
	Financial data	Emissions data		Equations	
<b>Option 1a</b>	Outstanding amount and property value at origination	Supplier-specific emission factors specific to the energy source	Primary data on actual building energy consumption	$\sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Actual energy consumption}_{b,e} \times \text{Supplier specific emission factor}_e$	<b>Score 1</b>
<b>Option 1b</b>		Average emission factors specific to the energy source	Primary data on actual building energy consumption	$\sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Actual energy consumption}_{b,e} \times \text{Average emission factor}_e$	<b>Score 2</b>
<b>Option 2a</b>			Estimated building energy consumption per floor area based on official building energy labels and floor area financed	$\sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Estimated energy consumption from energy labels}_{b,e} \times \text{Floor area}_b \times \text{Average emission factor}_e$	<b>Score 3</b>
<b>Option 2b</b>			Estimated building energy consumption per floor area based on building type and location-specific statistical data and floor area financed	$\sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Estimated energy consumption from statistics}_{b,e} \times \text{Floor area}_b \times \text{Average emission factor}_e$	<b>Score 4</b>

<sup>188</sup> Where b=building and e=energy source.

Option	Description				Data quality
	Attribution	Emission factor		Financed emissions calculation	Highest to lowest
	Financial data	Emissions data		Equations	
Option 3			Estimated building energy consumption per building based on building type and location-specific statistical data and number of buildings financed	$\sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Estimated energy consumption from statistics}_{b,e} \times \text{Number of buildings}_b \times \text{Average emission factor}_e$	Score 5

**MOTOR VEHICLE LOANS – DETAILED SUMMARY OF DATA NEEDS AND EQUATIONS TO CALCULATE FINANCED EMISSIONS***Table 10.1-6. Detailed description of the data quality score table for motor vehicle loans<sup>189</sup>*

Option	Description				Data quality
	Attribution	Emission factor		Financed emissions calculation	Highest to lowest
	Financial data	Emissions data		Equations	
<b>Option 1a</b>	Outstanding amount and total value of vehicle or vehicle fleet at origination	Emission factors <sup>190</sup> specific to the fuel type	Primary data on actual vehicle fuel consumption	$\sum_{v,f} \frac{\text{Outstanding amount}_v}{\text{Total value at origination}_v} \times \text{Fuel consumption}_v \times \text{Emission factor}_f$	<b>Score 1</b>
<b>Option 1b</b>			Primary data on actual vehicle distance traveled plus vehicle's fuel efficiency and fuel type from known vehicle make and model	$\sum_{v,f} \frac{\text{Outstanding amount}_v}{\text{Total value at origination}_v} \times \text{Distance travel}_v \times \text{Efficiency}_{v,f} \times \text{Emission factor}_f$	
<b>Option 2a</b>			Local statistical data for distance traveled plus vehicle's fuel efficiency and fuel type from known vehicle make and model	$\sum_{v,f} \frac{\text{Outstanding amount}_v}{\text{Total value at origination}_v} \times \text{Distance travel}_l \times \text{Efficiency}_{v,f} \times \text{Emission factor}_f$	<b>Score 2</b>

<sup>189</sup> Where v = vehicle or vehicle fleet with known make and model for that vehicle, t = vehicle or vehicle fleet with known vehicle type, a = assumed average vehicle or vehicle fleet, l = local estimation of distance traveled, r = regional estimation of distance traveled, s = local or regional estimation of distance traveled, f = fuel type (fuel type in the case of electric or hybrid vehicles can also refer to electricity).

<sup>190</sup> Of all options shown in the table, supplier-specific emission factors (e.g., from an electricity provider) for the respective primary activity data are always preferred over non-supplier-specific emission factors.



Option	Description				Data quality
	Attribution	Emission factor		Financed emissions calculation	Highest to lowest
	Financial data	Emissions data		Equations	
Option 2b			Regional statistical data for distance traveled plus vehicle's fuel efficiency and fuel type from known vehicle make and model	$\sum_{v,f} \frac{Outstanding\ amount_v}{Total\ value\ at\ origination_v} \times Distance\ travel_r \times Efficiency_{v,f} \times Emission\ factor_f$	Score 3
Option 3a			Local or regional statistical data for distance traveled plus vehicle's fuel efficiency and fuel type from known vehicle type	$\sum_{t,f} \frac{Outstanding\ amount_v}{Total\ value\ at\ origination_v} \times Distance\ travel_s \times Efficiency_{t,f} \times Emission\ factor_f$	Score 4
Option 3b			Local or regional statistical data for distance traveled plus vehicle fuel's efficiency and fuel type from average vehicle	$\sum_{a,f} \frac{Outstanding\ amount_v}{Total\ value\ at\ origination_v} \times Distance\ travel_s \times Efficiency_{a,f} \times Emission\ factor_f$	Score 5

## 10.2. Sample table templates displaying reported emissions for a given fiscal year

Table 10.2-7. Example of a GHG accounting report for scopes 1, 2, and 3

Scopes and categories	Baseline year emissions (tCO <sub>2</sub> e) (if relevant)	Current reporting year emissions (tCO <sub>2</sub> e)
<b>Scope 1 emissions</b>		
Total scope 1		
<b>Scope 2 emissions</b>		
Total scope 2		
<b>Upstream scope 3 emissions</b>		
Category 1: Purchased goods		
Category 2: Capital goods		
Category 3: Fuel- and energy-related activities		
Category 4: Upstream transportation and distribution		
Category 5: Waste generated in operations		
Category 6: Business travel		
Category 7: Employee commuting		
Category 8: Upstream leased assets		
<b>Downstream scope 3 emissions</b>		
Category 9: Downstream transportation and distribution		
Category 10: Processing of sold products		
Category 11: Use of sold products		
Category 12: End-of-life treatment of sold products		
Category 13: Downstream leased assets		
Category 14: Franchises		
Category 15: Investments**		
<b>Total emissions all scopes</b>		
Scope 1 total emissions		

Scopes and categories	Baseline year emissions (tCO <sub>2</sub> e) (if relevant)	Current reporting year emissions (tCO <sub>2</sub> e)
Scope 2 total emissions		
Scope 3 total emissions		
<b>Overall total emissions</b>		

See Table 10-8 and Table 10-9 for examples how to report scope 3 category 15 (investments) emissions.

Table 10-8. Example reporting of absolute financed emissions—scope 3, category 15 (investments)

Activity	Total outstanding loan and investments covered (x € 1,000)	Scope 1+ Scope 2 emissions (tCO <sub>2</sub> e)	Scope 3 emissions (tCO <sub>2</sub> e)	Emission intensity (tCO <sub>2</sub> e/€M)	Weighted data quality score (High Quality = 1 Low Quality = 5)
<b>Absolute emissions per asset class (if reporting by asset class)</b>					
Listed Equity & Bonds					
Business Loans					
-Sector 1, e.g., Cement					
-Sector 2, e.g., Cattle					
Project Finance					
Mortgages					
Commercial Real Estate					
Motor Vehicle Loans					
<b>Total</b>					
<b>Absolute emissions per sector (if reporting by sector)</b>					
Oil & Gas					
Agriculture					
<b>Total</b>					

Table 10.29. Example reporting of financed emission removals and avoided emissions—scope 3, category 15 (investments)

Activity	Total outstanding loan and investments covered (x € 1,000)	Emissions (tCO <sub>2</sub> e)	Emission intensity (tCO <sub>2</sub> e/€M)	Weighted data quality score (High Quality = 1 Low Quality = 5)
<b>Emission removals</b>				
<b>Total</b>				
<b>Avoided emissions from renewable power projects</b>				
Wind				
Solar				
<b>Total</b>				



# PCAF

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# The GLOBAL GHG ACCOUNTING & REPORTING Standard

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