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# CDP Technical Note: Portfolio Impact Metrics for Financial Services Sector Companies

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CDP Climate Change Questionnaire



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## Version

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Version	Revision date	Revision summary
1.0	07 January 2021	First release
2.0	21 January 2022	Minor revisions and question numbers updated to align with the 2022 CDP climate change questionnaire
3.0	25 January 2023	Minor revisions and the addition of avoided emissions, emission removals, insurance-associated emissions, and sovereign debt

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## Glossary

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<b>Asset managers</b>	Also known as investment managers, asset managers are hired by clients to invest assets on their behalf.
<b>Asset owners</b>	Includes public- and private-sector pension plans, (re)insurance companies, endowments, and foundations that invest assets on their own behalf or on behalf of their beneficiaries.
<b>Avoided emissions</b>	The reduction in emissions achieved by a project compared to a baseline of what would have been emitted in the absence of the project.
<b>Banks</b>	Financial institutions that mostly undertake lending, deposit taking and other financial intermediary activities.
<b>Carbon footprinting metrics</b>	Metrics for assessing the greenhouse gas emissions associated with a portfolio, depending on the metric emissions are expressed either in absolute terms or as an intensity.
<b>Carbon intensity</b>	Volume of carbon emissions per million of revenue in unit currency (carbon efficiency of a portfolio), expressed in tons CO <sub>2</sub> e/Million revenue.
<b>Carbon related assets</b>	The TCFD suggests defining carbon-related assets as those assets tied to the energy and utilities sectors under the Global Industry Classification Standard, excluding water utilities and independent power and renewable electricity producer industries.
<b>Commercial real estate</b>	For the purpose of this technical note, commercial real estate is on-balance-sheet loans for the purchase, refinance, construction, or rehabilitation of commercial real estate. This definition implies that the property is used for commercial purposes.
<b>Corporate loans</b>	For the purpose of this technical note, corporate loans are on-balance sheet loans and lines of credit with unknown use of proceeds to businesses, non-profits, and any other structure of organization. Revolving credit facilities and overdraft facilities as well as corporate loans secured by real estate, such as commercial real estate-secured lines of credit, are also included in this asset class.
<b>Double counting</b>	Double counting occurs when a GHG emission or emission reduction is counted more than once towards attaining mitigation pledges or financial pledges for the purpose of mitigating climate change.
<b>Emission removals</b>	Emissions sequestered or removed from the atmosphere and stored, preventing its harmful global warming effect.
<b>EU TEG</b>	European Union Technical Expert Group on Sustainable Finance.

<b>EVIC</b>	The sum of the market capitalization of ordinary and 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>Exposure metrics</b>	Metrics for assessing the exposure to carbon-related assets in a portfolio, depending on the metric exposure is expressed either in currency terms or as a percentage.
<b>Exposure to/value of carbon-related assets</b>	The amount or percentage of carbon-related assets in the portfolio expressed in Million of unit currency or percentage of the current portfolio value.
<b>GHG emissions</b>	For the purposes of this technical note, GHGs are the seven gases covered by the UNFCCC: carbon dioxide (CO <sub>2</sub> ); methane (CH <sub>4</sub> ); nitrous oxide (N <sub>2</sub> O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); sulfurhexafluoride (SF <sub>6</sub> ), and nitrogen trifluoride (NF <sub>3</sub> ).
<b>GHG Protocol</b>	Comprehensive global standardized framework to measure and manage GHG emissions established by World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).
<b>Global Industry Classification Standard</b>	The Global Industry Classification Standard (GICS) is a four-tiered, hierarchical industry classification system developed by MSCI and S&P Dow Jones.
<b>Insurance-associated emissions</b>	GHG emissions in the real economy, which are associated with specific re/insurance policies aggregated in the re/insurance portfolio. This definition is for accounting purposes only. It is not intended, and should not be interpreted as, an admission of liability by any re/insurer for any emissions caused, or contributed to, by an insured or an insured activity.
<b>Insurers</b>	Financial institutions that provide and sell insurance underwriting products and services to their policyholders. Please note that where references are made to "insurance", these are also applicable to reinsurance unless otherwise specified.
<b>Investees</b>	For the purposes of this technical note, investees means the underlying companies and assets a financial institution is invested in or lending to.
<b>Listed bonds</b>	For the purposes of this technical note, listed bonds are all corporate bonds without known use of proceeds.
<b>Listed equity</b>	For the purposes of this technical note, listed equity is all equity holdings on the balance sheet and/or actively managed by the financial institution which are traded on a stock exchange or another securities exchange.
<b>Mortgages</b>	For the purpose of this technical note, mortgages are on-balance sheet loans used to purchase residential property, including multifamily properties with no limit on the number

of units. This definition implies that the property is used for residential purposes.

**Motor vehicle loans**

For the purpose of this technical note, motor vehicle loans are on-balance sheet loans that are used to finance one or several motor vehicles.

**PCAF**

Partnership for Carbon Accounting Financials.

**Portfolio**

The entire collection of a financial institution's core financing activities - loans, investments and insurance policies. For bank lending, this is the entire collection of products and loans held on the balance sheet for which the receivable stream is owned. For asset owners, this is the entire collection of products, funds and investments owned and controlled. For asset managers, this is the entire collection of products and investments held and/or managed on behalf of clients. For insurance underwriting, this is the entire collection of products and insurance policies provided to clients.

**Portfolio carbon footprint**

Total carbon emissions for a portfolio normalized by the market value of the portfolio, expressed in tons CO<sub>2</sub>e/Million of unit currency invested.

**Private equity**

For the purpose of this technical note, private equity is all equity holdings in non-listed companies held on the balance sheet and/or actively managed by the financial institution.

**Project finance**

For the purpose of this technical note, project finance is on-balance sheet loans or equity with known use of proceeds that are designated for a clearly defined activity or set of activities, such as the construction of a gas fired power plant, a wind or solar project or energy efficiency projects.

**Scope 1 emissions**

Emissions from operations that are owned or controlled by the reporting company.

**Scope 2 emissions**

Indirect emissions from the generation of purchased or acquired electricity, steam, heat or cooling consumed by the reporting company.

**Scope 3 emissions**

All indirect emissions (not included in Scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.

**Sovereign debt**

Sovereign debt is issued by a country's government to borrow money. Sovereign debt is also known as government debt, public debt, and national debt.

**Portfolio emissions**

The absolute greenhouse gas emissions associated with a portfolio, expressed in tons CO<sub>2</sub>e.

**TCFD**

Task Force on Climate-related Financial Disclosures.

**Weighted average carbon intensity**

Portfolio's exposure to carbon-intensive companies, expressed in tons CO<sub>2</sub>e/Million of revenue in unit currency.

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# 1. Introduction

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This Technical Note provides specific guidance on the methodologies used to calculate portfolio impact metrics requested by CDP. It is aimed at banks, asset managers, asset owners and insurers responding to CDP's climate change questionnaire. The Technical Note should be used alongside [CDP's 2023 climate change reporting guidance](#).

The technical note is comprised of this introduction and four further sections:

**Section 2:** An overview of the different portfolio impact metrics requested by CDP.

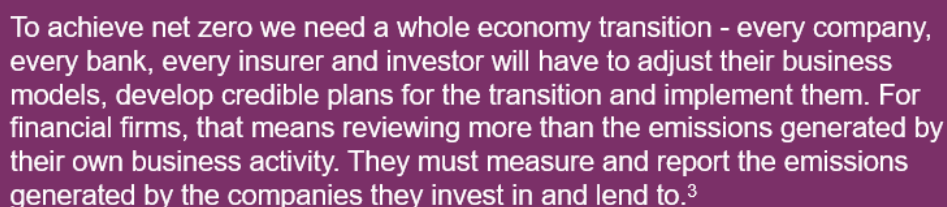
**Section 3:** Specific guidance for each metric. The guidance covers methodologies for calculating the metrics, best-practice in reporting the metrics to CDP, and includes worked examples.

**Section 4:** Guidance on breaking down portfolio impact metrics by asset class, industry, geography and scope, including a worked example.

**Section 5:** A discussion on how financial institutions can go further in using these metrics once they have measured their portfolio impact. For example, setting targets to reduce the climate change impact of their portfolio.

Alignment with a 1.5-degree world will require a major redirection of capital into sustainable solutions and low-carbon technologies, which only the financial services sector can provide. This profound influence on the wider economy means financial institutions' climate change impact occurs mostly in their portfolios, rather than through their direct operations. It also means financial institutions can play a pivotal role in accelerating the low-carbon transition. Measuring the climate change impact of financial portfolios will be crucial in realising this role.

The importance of measuring portfolio impact is underlined by the TCFD, which recommends financial institutions disclose the metrics used to measure and manage climate-related risks and opportunities, and describes specific portfolio impact metrics for this purpose<sup>1</sup>. In addition to highlighting risks and opportunities, a quantification of climate change impact is a pre-requisite for financial institutions to measure improvements in the climate performance of their portfolios, and measure progress towards the net zero commitments that are increasingly being made<sup>2</sup>. Mark Carney, the UK Prime Minister's finance advisor for COP26, said:



To achieve net zero 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. For financial firms, that means reviewing more than the emissions generated by their own business activity. They must measure and report the emissions generated by the companies they invest in and lend to.<sup>3</sup>

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<sup>1</sup> Task Force on Climate-related Financial Disclosures (2017). "[Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures](#)."

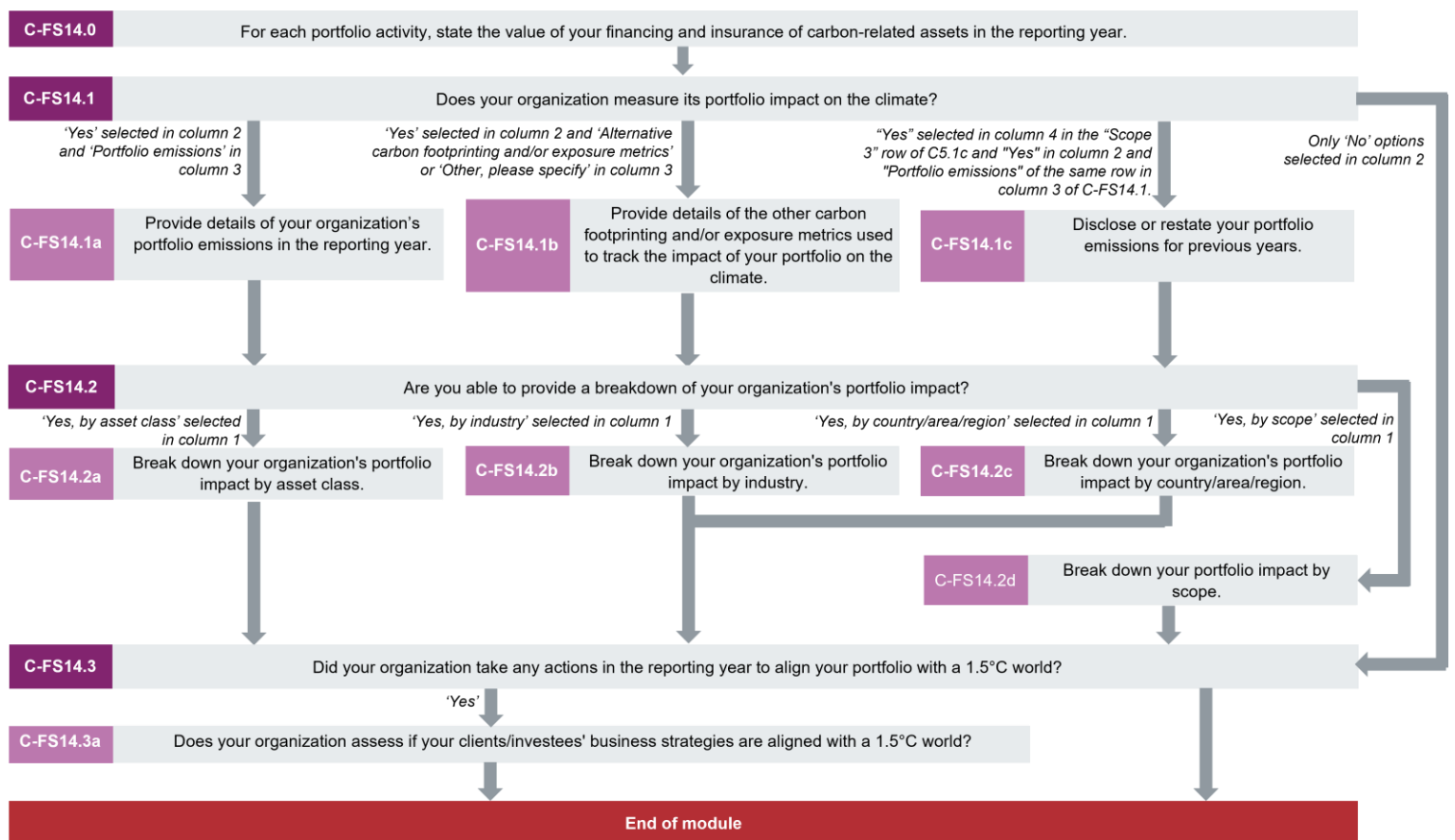
<sup>2</sup> See, for example, the net zero commitments made by [Barclays](#) and [Morgan Stanley](#).

<sup>3</sup> <https://carbonaccountingfinancials.com/newsitem/partnership-for-carbon-accounting-financials-pcaf-launches-uk-coalition>.

The financial services sector is heterogeneous, with banks, investors and insurers providing a diverse set of services which together underpin the stability of our financial system. Financial institutions also hold a variety of different asset classes in their portfolios. Reflecting this, there is currently no single, globally approved methodology for measuring portfolio impact that applies to all financial institutions and all financing activities. However, there have been important developments in methodologies since the release of the TCFD's recommendations, including those by the Partnership for Carbon Accounting Financials (PCAF).

Alongside these developments, CDP launched its first questionnaire focusing on publicly listed financial services companies in 2020. The questionnaire fills a critical data gap by shifting the focus onto the environmental impacts these companies finance in the wider economy. Portfolio impact metrics are included as a disclosure request in module C14. However, recognising that there is no universal methodology for measuring portfolio impact, the questions allow a variety of metrics to be reported.

### C14 module structure





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## 2. Overview of common portfolio impact metrics

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There are a variety of carbon footprinting and exposure metrics available to financial institutions; rather than a single, globally approved methodology that applies to all financing activities. This complexity is often cited by companies as a reason for not yet measuring their portfolio impact. The complexity partly results from the heterogeneity of the financial services sector. Banks, investors and insurers provide a diverse set of services and hold a variety of different asset classes in their portfolios. Some metrics are better suited than others to certain industry activities or asset classes.

Another challenge often cited by financial services companies is access to the data required to calculate portfolio impact metrics. A further reason for the multitude of available metrics is that some metrics have more onerous data requirements while others can be calculated relatively simply.

As anthropogenic climate change is caused by GHG emissions, carbon footprinting metrics are measured in GHG emissions 'owned' by the portfolio, which can then be normalized to compare across portfolios<sup>4</sup>. This approach demands data on the GHG emissions of companies in the portfolio, which can be either self-disclosed or estimated. Exposure metrics are not measured in GHG emissions; instead a population of carbon-related assets is defined and the level of carbon-related assets in the portfolio, in either currency or percentage terms, is measured. This approach does not demand data on the GHG emissions of the underlying companies and so is less onerous in its data demands. However, it does require an agreed taxonomy of what constitutes a carbon-related asset<sup>5</sup>.

Table 1 presents an overview of common carbon footprinting and exposure metrics which can be used to measure portfolio impact and reported to CDP<sup>6</sup>. It lists which industry activities and asset classes each metric is applicable to, along with the pros and cons of each metric, including which can be calculated without demanding data requirements. Section 3 goes into more detail on each metric presented.

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<sup>4</sup> There are different approaches to normalization, as described in Section 3.

<sup>5</sup> The TCFD suggests defining carbon-related assets as those assets tied to the energy and utilities sectors under GICS, excluding water utilities and independent power and renewable electricity producer industries.

<sup>6</sup> Task Force on Climate-related Financial Disclosures (2017). "[Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures](#)."

Table 1

Metric	Description	Industry activities	Asset classes	CDP question	Pros	Cons
<b>Portfolio emissions</b>	The absolute greenhouse gas emissions associated with a portfolio, expressed in tons CO <sub>2</sub> e	Banks, Asset owners, Asset managers	Listed equity, listed bonds, corporate loans, private equity, project finance, commercial real estate, mortgages, motor vehicle loans, and sovereign debt	C-FS14.1a	<ul style="list-style-type: none"> <li>+ May be used to communicate the carbon footprint of a portfolio consistent with the GHG protocol</li> <li>+ May be used to track changes in GHG emissions in a portfolio</li> <li>+ Allows for portfolio decomposition and attribution analysis</li> </ul>	<ul style="list-style-type: none"> <li>- Not generally used to compare portfolios because the data are not normalized</li> <li>- Changes in underlying companies' market capitalization can be misinterpreted</li> </ul>
<b>Weighted average carbon intensity</b>	Portfolio's exposure to carbon-intensive companies, expressed in tons CO <sub>2</sub> e/Million revenue	Banks, Asset owners, Asset managers	Listed equity, listed bonds, corporate loans, private equity	C-FS14.1b	<ul style="list-style-type: none"> <li>+ Can be easily applied across asset classes since it does not rely on equity ownership approach</li> <li>+ The calculation is fairly simple and easy to communicate to investors</li> <li>+ Allows for portfolio decomposition and attribution analysis</li> </ul>	<ul style="list-style-type: none"> <li>- Sensitive to outliers</li> <li>- Using revenue (instead of physical or other metrics) to normalize the data tends to favor companies with higher pricing levels relative to their peers</li> </ul>
<b>Portfolio carbon footprint</b>	Total carbon emissions for a portfolio normalized by the market value of the portfolio, expressed in tons CO <sub>2</sub> e/Million invested	Banks, Asset owners, Asset managers	Listed equity, listed bonds, corporate loans, private equity, project finance, commercial real estate, mortgages, motor vehicle loans	C-FS14.1b	<ul style="list-style-type: none"> <li>+ May be used to compare and benchmark portfolios</li> <li>+ Using the portfolio market value to normalize data is fairly intuitive to investors</li> <li>+ Allows for portfolio decomposition and attribution analysis</li> </ul>	<ul style="list-style-type: none"> <li>- Does not take into account differences in the size of companies (e.g. does not consider the carbon efficiency of companies)</li> <li>- Changes in underlying companies' market capitalization can be misinterpreted</li> </ul>

Metric	Description	Industry activities	Asset classes	CDP question(s)	Pros	Cons
<b>Carbon intensity</b>	Volume of carbon emissions per million dollars of revenue (carbon efficiency of a portfolio), expressed in tons CO <sub>2</sub> e/Million revenue	Banks, Asset owners, Asset managers	Listed equity, listed bonds, corporate loans, private equity	C-FS14.1b	<ul style="list-style-type: none"> <li>+ May be used to compare and benchmark portfolios</li> <li>+ Takes into account differences in the size of companies (e.g. considers the carbon efficiency of companies)</li> <li>+ Allows for portfolio decomposition and attribution analysis</li> </ul>	<ul style="list-style-type: none"> <li>– The calculation is somewhat complex and may be difficult to communicate</li> <li>– Changes in underlying companies' market capitalization can be misinterpreted</li> </ul>
<b>Insurance-associated emissions</b>	GHG emissions in the real economy, which are associated with specific re/insurance policies aggregated in the re/insurance portfolio. This definition is for accounting purposes only. It is not intended, and should not be interpreted as, an admission of liability by any re/insurer for any emissions caused, or contributed to, by an insured or an insured activity.	Insurers	Insurance underwriting	C-FS14.1b	<ul style="list-style-type: none"> <li>+ A standardized way to measure and report the GHG emissions associated to re/insurance underwriting portfolios</li> <li>+ Addressing the issue of double counting by maintaining that the reporting of insurance-associated emissions remains a supplementary note to the financed emissions</li> </ul>	<ul style="list-style-type: none"> <li>– The first version of the PCAF Insurance-Associated Emissions Standard covers only two business segments</li> <li>– Reinsurance is excluded from the first version of the Insurance-Associated Emissions Standard</li> </ul>

<b>Exposure to/value of carbon-related assets (currency)</b>	The amount of carbon-related assets in the portfolio, expressed in Millions of unit currency	Banks, Asset owners, Asset managers, Insurers	Listed equity, listed bonds, corporate loans, private equity, project finance, insurance underwriting	C-FS14.0	<ul style="list-style-type: none"> <li>+ Can be applied across industry activities and asset classes</li> <li>+ Does not rely on underlying companies' Scope 1 and Scope 2 GHG emissions</li> </ul>	<ul style="list-style-type: none"> <li>– Generally not used to compare portfolios because the data are not normalized</li> <li>– Does not provide information on sectors or industries other than those included in the definition of carbon-related assets</li> </ul>
<b>Exposure to/value of carbon-related assets (%)</b>	The percentage of carbon-related assets in the portfolio, expressed in percentage of the current portfolio value	Banks, Asset owners, Asset managers, Insurers	Listed equity, listed bonds, corporate loans, private equity, project finance, insurance underwriting	C-FS14.0	<ul style="list-style-type: none"> <li>+ Can be applied across industry activities and asset classes</li> <li>+ Does not rely on underlying companies' Scope 1 and Scope 2 GHG emissions</li> </ul>	<ul style="list-style-type: none"> <li>– Does not provide information on sectors or industries other than those included in the definition of carbon-related assets</li> </ul>

Table 1 is not exhaustive. For example, avoided emissions and emission removals are not included in the table, but they are briefly described in section 3. In outlining common carbon footprinting and exposure metrics, the TCFD expected “disclosure of this information to prompt important advancements in the development of decision-useful, climate-related risk metrics.”<sup>7</sup> In 2020, they released a consultation on forward-looking metrics including implied temperature rise<sup>8</sup>. It is expected that further advancements will increase the coverage of industry activities and asset classes. Additional metrics and methodologies will be added to CDP’s reporting framework as they become available.

Currently, if a company wishes to disclose a portfolio impact metric not listed in Table 1, they can do so by:

- ▼ Selecting ‘Yes’ in response to C-FS14.1 ‘Does your organization measure its portfolio impact on the climate?’, column two;
- ▼ Selecting ‘Other, please specify’ in response to C-FS14.1, column three; and
- ▼ Disclosing the metric in response to C-FS14.b ‘Provide details of the other carbon footprinting and/or exposure metrics used to track the impact of your portfolio on the climate’, using ‘Other, please specify’ in column two.

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<sup>7</sup> Task Force on Climate-related Financial Disclosures (2017). "[Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures](#)."

<sup>8</sup> Task Force on Climate-related Financial Disclosures (2020). "[Forward-Looking Financial Sector Metrics Consultation](#)."

## 3. Metric-level technical guidance

### a. Portfolio emissions

<b>Description</b>	The absolute greenhouse gas emissions associated with a portfolio, expressed in tons CO <sub>2</sub> e
<b>Industry activities</b>	Banks, Asset owners, Asset managers
<b>Asset classes</b>	Listed equity, listed bonds, corporate loans, private equity, project finance, commercial real estate, mortgages, motor vehicle loans, and sovereign debt
<b>CDP question</b>	C-FS14.1a
<b>Pros</b>	<ul style="list-style-type: none"> <li>+ May be used to communicate the carbon footprint of a portfolio consistent with the GHG protocol</li> <li>+ May be used to track changes in GHG emissions in a portfolio</li> <li>+ Allows for portfolio decomposition and attribution analysis</li> </ul>
<b>Cons</b>	<ul style="list-style-type: none"> <li>– Not generally used to compare portfolios because the data are not normalized</li> <li>– Changes in underlying companies' market capitalization can be misinterpreted</li> </ul>

Anthropogenic climate change is caused by GHG emissions. Therefore, the most natural way for companies to measure their impact on climate change is by accounting for the GHG emissions caused by their operations. The [GHG Protocol Corporate Standard](#) divides a company's GHG emissions inventory into direct and indirect emissions. For financial institutions, the indirect emissions caused by their financing activities are relevant and their emissions inventory would be incomplete without accounting for them<sup>9</sup>. The GHG Protocol classifies these emissions in Scope 3 Category 15 Investments<sup>10</sup>. They are also known as portfolio emissions or financed emissions. Put simply, they are emissions that occur at sources owned or controlled by other companies, but which are made possible because those companies are financed by the investment and lending (and insurance underwriting) of financial institutions; therefore, they can be thought of as caused indirectly by the financial institution and should be included in the financial institutions Scope 3 inventory<sup>11</sup>.

The general approach to accounting for portfolio emissions is to establish the emissions of the investees in the portfolio and then allocate those emissions based on the proportional share of the investment in the investee. Exactly how the emissions of the investee are allocated between investors differs depending on the asset class, but the principle of proportional share applies in each case. Summing across all investments in the portfolio yields the total portfolio emissions in tons CO<sub>2</sub>e. This approach has been formalized by PCAF who have developed the [Global Carbon Accounting Standard](#) for the financial industry with the GHG Protocol as its foundation.

<sup>9</sup> Relevance and completeness are two of the GHG accounting and reporting principles in the GHG Protocol Corporate Standard.

<sup>10</sup> Bhatia, P., Cummis, C., Brown, A., Rich, D., Draucker, L., & Lahd, H. (2012). "[Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard. Supplement to the GHG Protocol Corporate Accounting and Reporting Standard.](#)"

<sup>11</sup> Portfolio emissions are included in financial institutions' Scope 3 inventory if they are using a control approach to defining operational boundaries and consolidating GHG emissions. In contrast, if the equity share approach is used, emissions associated with equity investments would be included in financial institutions' Scope 1 inventory. PCAF's [Global Carbon Accounting Standard](#) for the financial industry requires financial institutions to use the operational control approach, so that approach is assumed throughout the guidance in this technical note. For more information on different approaches to defining operational boundaries and consolidating GHG emissions see the [GHG Protocol](#).

## **PCAF**

PCAF is an industry-led initiative created in 2015 by Dutch financial institutions and now includes a global group of bank and investor members. The partnership works together to develop and implement a harmonized approach to assessing and disclosing the GHG emissions associated with loans and investments. PCAF has developed its accounting methods into the [Global Carbon Accounting Standard](#) for the financial industry covering the following asset classes: Listed equity and corporate bonds, business loans, private equity, project finance, commercial real estate, mortgages, motor vehicle loans, and sovereign debt.

Financial institutions can join PCAF by committing to assess and disclose the GHG emissions of its portfolio using the methodology. Financial institutions that join receive technical support in implementing carbon accounting and can join one of five regional teams which will adapt the Global Carbon Accounting Standard to their regional context, for example by expanding to additional asset classes important to the region.

Module C14 of CDP's climate change questionnaire is broadly aligned with the [first version](#) of PCAF's Global GHG Accounting and Reporting Standard and allows financial institutions to report their portfolio emissions in a way compatible with the standard. Note that CDP's 2023 climate change questionnaire was developed before the release of the second version "PCAF (2022). The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second Edition.". However, any accounting metrics not listed in CDP's questionnaire can be reported in question C-FS14.1b as "other, please specify". We invite readers of this technical note to download and consult the [second version](#) of the PCAF standard as a supplement to this note.



Calculating the metric in CO<sub>2</sub>e is useful for communicating the total size of the impact of a financial institution. However, it is not as useful for comparing different portfolios, for example comparing an investor's different funds, as the data are not normalized. In addition to being a useful metric in its own right, portfolio emissions are used as a building block in other carbon footprinting metrics, and is normalized to allow comparisons. How portfolio emissions are normalized depends on what is being analysed and communicated. For example, to understand a portfolio's carbon footprint per amount invested, it is necessary to normalise by the portfolio market value. To understand the efficiency of a portfolio in emissions per unit of output, it is necessary to normalise by an issuer's accounting figure such as revenues. These normalization approaches lead to different portfolio impact metrics which will be discussed later.

### ***Portfolio emissions calculation methodology by asset class***

Below are the methodologies for calculating the portfolio emissions metric for each applicable asset class. See the [Global Carbon Accounting Standard](#) for fuller explanations of each methodology.



## Listed equity and corporate bonds

$$\sum_{c=1}^C \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{Company emissions}_c$$

Where:

- $c$**  is an investee in a portfolio of investees from 1 ...  $C$ ;
- $\text{Outstanding amount}_c$**  is the actual outstanding amount in listed equity or bonds of investee  $c$ ;
- $\text{EVIC}_c$**  is the enterprise value including cash of investee  $c$ ; and,
- $\text{Company emissions}_c$**  is the total accounted emissions of investee  $c$ .

For listed equity and bonds, the attribution of emissions is according to the ratio of an investor's outstanding investment amount to the enterprise value of the company they are invested in. For enterprise value, EVIC is used, commonly referred to as the sum of the market capitalization of ordinary and 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.<sup>12</sup> This definition of enterprise value ensures that exactly 100% of all investee's emissions will be attributed to the equity and debt holders as these now jointly determine 100% of the company's EVIC.

Portfolio emissions are measured at a fixed point in time. The ratio used for attribution can be taken at that fixed point in time, or can be corrected with a flow variable, given financial portfolios are dynamic. For example, an asset manager that owns 100% of company A during the entire year but sells the stake on December 30, would not accurately express their exposure to company A during the year in the carbon accounting assessment. In this case, they could correct the assessment using a flow variable of the proportion of days the investor held company A in its book during the year (i.e. 364/365).

One side-effect of using the ratio of outstanding amount to EVIC for attribution is that changes in underlying companies' market capitalization and/or volume of debt can be misinterpreted as it leads to a change in the portfolio emissions metric.

For financial institutions which only invest in equity and calculate portfolio emissions from a risk perspective, attribution can instead be according to the ratio of outstanding amount in listed equity to total market capitalization (with no deductions of cash). This follows the ownership approach and is aligned with financial reporting and consolidation rules.

A crucial component of the above calculation is the emissions of the companies within the portfolio, which can be a challenge to establish given data limitations. However, these limitations should not deter financial institutions from taking the first steps towards calculating portfolio emissions, as a hierarchy of data sources are available, from verified reported emissions (most accurate) to emissions estimates based on economic activity modelling (least accurate) – see Figure 1. Even estimated or proxy data can help in identifying carbon-intensive hotspots in portfolios. In addition, availability of emissions data for companies within the portfolio is likely to lag financial data. This should also not deter financial institutions and the most recent emissions data should be used.

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<sup>12</sup> EU Technical Expert Group on Sustainable Finance (2019). "TEG Interim Report on Climate Benchmarks and Benchmarks' ESG Disclosures," [https://commission.europa.eu/system/files/2019-06/190618-sustainable-finance-teg-report-climate-benchmarks-and-disclosures\\_en.pdf](https://commission.europa.eu/system/files/2019-06/190618-sustainable-finance-teg-report-climate-benchmarks-and-disclosures_en.pdf).



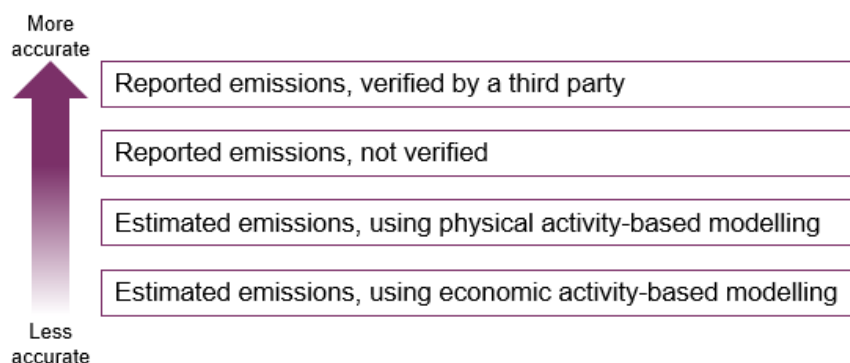


Figure 1

Reported emissions, whether verified or not, could be collected by the financial institution directly from the companies within their portfolio or indirectly via third-party data providers such as CDP.

Using physical activity-based modelling to estimate emissions entails using primary physical activity data on companies, such as tons of steel produced, and emissions factors per physical activity (tCO<sub>2</sub>e/t of steel). Financial institutions could do this modelling themselves or use modelling completed by data providers. CDP uses physical activity-based modelling in estimating emissions of non-responding companies in the following high-impact sectors: oil and gas extraction, coal mining, electric power generation, steel manufacturing, cement manufacturing and automotive manufacturing.

Using economic activity-based modelling to estimate emissions entails using economic activity data, such as revenue, and Environmentally Extended Input Output tables providing region/sector-specific average emission factors per economic activity (tCO<sub>2</sub>e/revenue in unit currency). Financial institutions could do this modelling themselves or use modelling completed by data providers. CDP uses economic activity-based modelling in estimating emissions of non-responding companies in all sectors for which physical activity-based modelling is not used.

When establishing the emissions of companies within the portfolio, it is important to be clear which Scopes are considered. According to the Global Carbon Accounting Standard, Scope 1 and 2 emissions of companies should always be considered, regardless of sector. Scope 3 emissions should be considered if possible, and at a minimum should be considered for companies in sectors where they are a significant portion of total emissions, e.g. mining<sup>13</sup>. Data limitations are likely to be even more serious for Scope 3 emissions.

<sup>13</sup> The EU TEG have defined a phased-in approach for when scope 3 emissions must be considered for various sectors in regulatory minimum standards for EU Climate Transition Benchmarks and EU Paris-aligned Benchmarks. EU Technical Expert Group on Sustainable Finance (2019). "TEG Interim Report on Climate Benchmarks and Benchmarks' ESG Disclosures," [https://commission.europa.eu/system/files/2019-06/190618-sustainable-finance-teg-report-climate-benchmarks-and-disclosures\\_en.pdf](https://commission.europa.eu/system/files/2019-06/190618-sustainable-finance-teg-report-climate-benchmarks-and-disclosures_en.pdf).

## Corporate loans and private equity

$$\sum_{c=1}^C \frac{\text{Outstanding amount}_c}{(\text{EVIC}_c) \text{ or } (\text{Total company equity} + \text{debt}_c)} \times \text{Company emissions}_c$$

Where:

- $c$  is an investee in a portfolio of investees from 1 ...  $C$ ;
- $\text{Outstanding amount}_c$  is the actual outstanding loan amount or private equity in investee  $c$ ;
- $\text{EVIC}_c$  is the enterprise value including cash of investee  $c$ ;
- $\text{Total company equity} + \text{debt}_c$  is the total equity and debt from investee  $c$ 's balance sheet; and,
- $\text{Company emissions}_c$  is the total accounted emissions of investee  $c$ .

For corporate loans and private equity, the same principle is followed of attributing emissions according to the ratio of an investor or bank's outstanding investment (loan) amount to the value of the company they are invested in (lending to). However, for corporate loans to non-listed companies and private equity, EVIC is not likely to be available due to the lack of information on market capitalization. In this case, the total balance sheet value expressed as the sum of total company equity and debt shall be used.

As with the methodology for listed equity and listed bonds, emissions of the portfolio companies are a crucial component of the calculation. All the same data considerations apply, including using the most accurate data available from the hierarchy in Figure 1 and being clear on which Scopes are considered. Disclosure of emissions data is likely to be less complete for non-listed companies, which will result in a greater proportion of the portfolio emissions metric being calculated using modelled data. Financial institutions can engage with their investees and borrowers to encourage better disclosure practices.

## Project finance

$$\sum_{p=1}^P \frac{\text{Outstanding financing (debt + equity)}_p}{(\text{Total project size}_p) \text{ or } (\text{Total assets}_p)} \times \text{Project emissions}_p$$

Where:

<b><i>p</i></b>	is a project in a portfolio of projects from 1 ... <i>P</i> ;
<b><i>Outstanding financing (debt + equity)<sub>p</sub></i></b>	is the outstanding amount of debt or equity provided to project <i>p</i> by the financier;
<b><i>Total project size<sub>p</sub></i></b>	at the start of the project, is the total initial financing available to realise project <i>p</i> ;
<b><i>Total assets<sub>p</sub></i></b>	in subsequent years, is the total debt plus equity within project <i>p</i> ; and,
<b><i>Project emissions<sub>p</sub></i></b>	is the total accounted emissions of project <i>p</i> .

For project finance, the attribution of emissions is according to the ratio of an investor's outstanding debt or equity investment in the project to the total project size. At the start of the project, project size is the total debt and equity financing available to realise the project. For new projects, investors should use this variable in the calculation of portfolio emissions. As projects progress, it is expected that they will report annually on their financials including balance sheet information. For ongoing projects, investors should use the reported total assets within the project in the calculation of portfolio emissions.

Guarantees are used frequently in project finance structures. According to the Global Carbon Accounting Standard, guarantees carry no attribution (so are not included in the Outstanding financing variable) unless and until they are called and become loans.

A key component of the above calculation is the emissions associated with projects within the portfolio. This means emissions generated by the project. For example, if the project is the construction of a gas-fired power plant, this would be the emissions generated by the construction and running of the plant, but not emissions related to activities outside the project but within the same financed organization. As well as generating emissions, project finance can lead to avoided emissions and emissions removals. Avoided emissions are the reduction in emissions achieved by a project compared to a baseline of what would have been emitted in the absence of the project. Project financing for renewable energy projects such as wind or solar energy generation are common, and achieve avoided emissions compared to energy generation using fossil fuels. Emissions removals are CO<sub>2</sub> sequestered or removed from the atmosphere and stored, preventing its harmful global warming effect. Removals can also be relevant, particularly for projects related to afforestation and land-use. While it is important for financial institutions to measure avoided emissions and emissions removals achieved through their financing, these are not to be factored into the portfolio emissions calculation above, to ensure gross emissions are being reported.

In establishing the emissions associated with individual projects, the hierarchy of possible data sources in Figure 1 should be used in the same way. Emissions reported by the project and verified by a third-party are the most accurate source. Financial institutions will benefit from better quality disclosures of emissions data if they integrate requirements into their due diligence and

monitoring processes for project finance<sup>14</sup>. If reported emissions are not available, financial institutions should use the most accurate source available in the hierarchy.

### Commercial real estate

$$\sum_{b=1}^B \frac{\text{Outstanding amount}_b}{\text{Construction cost}_b \text{ or Value at origination}_b} \times \text{Energy consumption}_b \times \text{Emission factor}_e$$

Where:

- b*** is a building in a portfolio of buildings from 1 ... *B*;
- Outstanding amount<sub>b</sub>*** is the outstanding amount held of the loan used to develop, construct, purchase, refinance, or rehabilitate building *b*;
- Construction cost<sub>b</sub>*** is the total cost of construction for building *b*, whether financed by debt or equity;
- Value at origination<sub>b</sub>*** is the property value of building *b* at the time of loan origination;
- Energy consumption<sub>b</sub>*** is the annual energy consumption of building *b*; and,
- Emission factor<sub>e</sub>*** is an emission factor specific to the respective energy source of building *b*'s energy consumption.

For commercial real estate, the approach to attributing emissions depends on whether the loan is for the development or construction of a building, or for the purchase or refinance of a building that is already developed. For buildings under development, attribution is according to ratio of the outstanding loan amount to the total construction cost of the building. For already developed buildings which are purchased with commercial real estate lending, attribution is according to the ratio of the outstanding loan amount to the property value at the time of loan origination (or at the time of refinancing). These data should be readily available to lenders as property valuation of security interests is a common step during commercial real estate lending processes.

A crucial component of the above calculation is the Scope 1 and 2 emissions from the buildings financed through the portfolio, which is the product of the buildings' energy consumption and emissions factors for each energy consumed. Direct measurement of building energy consumption is preferred but may not be widely available. If direct measurement is not available, there is a hierarchy of public data sources available to lenders, from energy labels (most accurate) to emissions estimates per building based on the building type and location (least accurate) – see Figure 2.

<sup>14</sup> The [Equator Principles](#) can be adopted as best practice for assessing and monitoring the environmental impacts of project finance transactions. E.g. under the Equator Principles: "The client will report publicly, on an annual basis, GHG emission levels (combined Scope 1 and Scope 2 Emissions, and, if appropriate, the GHG efficiency ratio) during the operational phase for Projects emitting over 100,000 tonnes of CO<sub>2</sub> equivalent annually."

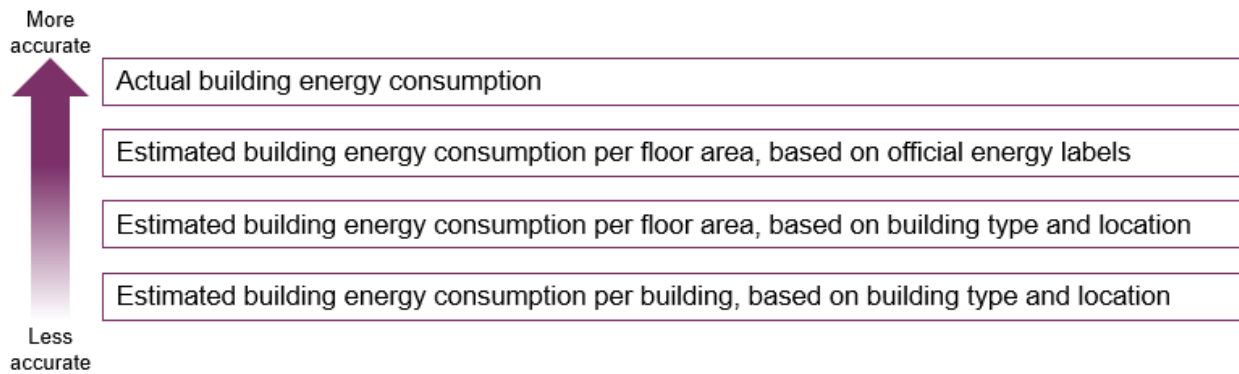


Figure 2

## Mortgages

$$\sum_{b=1}^B 100\% \times \text{Energy consumption}_b \times \text{Emission factor}_e$$

Where:

***b*** is a building in a portfolio of buildings from 1 ... *B*;

***Energy consumption<sub>b</sub>*** is the energy consumption of building *b*; and,

***Emission factor<sub>e</sub>*** is an emission factor specific to the respective energy source of building *b*'s energy consumption.

For mortgages, 100% of the Scope 1 and 2 emissions from the properties financed through a lender's mortgage portfolio are attributed to the lender's portfolio emissions. This is because lenders are often the only provider of a mortgage to purchase a residential property, and can consider the energy characteristics of properties during the lending decision.

As with the methodology for commercial real estate, building energy consumption and emission factors are components of the calculation. The same data considerations apply including using the most accurate data available from the hierarchy in Figure 2. Across vast mortgage portfolios, financial institutions are unlikely to be working with actual energy consumption data. This means there will necessarily be assumptions and averages used in the calculation of mortgage portfolio emissions. Financial institutions should use the most specific averages available to them to ensure their estimations are as precise as possible. For example, using average energy consumption based on floor area and the specific energy labels of properties will lead to more precise estimates than using average energy consumption based on property type. Similarly, using emission factors based on regional electricity grid mix data will lead to more precise estimates than using country-level electricity grid mix data.

## Motor vehicle loans

$$\sum_{v=1}^V \left( \frac{\text{Outstanding amount}_v}{\text{Value at origination}_v} \right)^* \times \text{Efficiency}_v \times \text{Distance travelled}_v \times \text{Emission factor}_f$$

Where:

- $v$  is a vehicle in a portfolio of vehicles from 1 ...  $V$ ;
- $*$  denotes a term only applied for business motor vehicle loans, and replaced with 100% for consumer motor vehicle loans;
- Outstanding amount<sub>v</sub>** is the outstanding loan amount held;
- Value at origination<sub>v</sub>** is value of the purchased fleet;
- Efficiency<sub>v</sub>** is the fuel efficiency of vehicle  $v$ ;
- Distance travelled<sub>v</sub>** is the distance travelled by vehicle  $v$ ; and,
- Emission factor<sub>f</sub>** is an emission factor specific to the respective fuel type of vehicle  $v$ .

For motor vehicle loans, the approach to attribution differs for business motor vehicle loans (i.e. financing a fleet) and consumer motor vehicle loans. For business motor vehicle loans, attribution is according to the ratio of outstanding loan amount to the value of the fleet at loan origination. This approach reflects the likelihood multiple lenders are providing financing and ensures the borrower takes ownership of the emissions for their equity stake in the fleet. The attribution approach for business motor vehicle loans is conceptually similar to the approach for commercial real estate.

For consumer motor vehicle loans, attribution of emissions is 100%, reflecting the likelihood there is only one lender. This attribution approach is conceptually similar to the approach for mortgages.

The emissions considered and included in portfolio emissions are those associated with running the vehicle. For vehicles with internal combustion engines these are direct emissions from fuel combustion (Scope 1); and for electric vehicles these are indirect emissions associated with electricity generation (Scope 2). This is the product of the vehicle's fuel efficiency, the distance the vehicle travels and an emission factor for the GHG emissions per unit of fuel. Depending on the data available to a financial institution, the efficiency and distance travelled of vehicles in their portfolio may be known or estimated with various degrees of accuracy. As with other asset classes, there is a hierarchy of possible data sources and the most precise source available should be used in the calculation – see Figure 3.

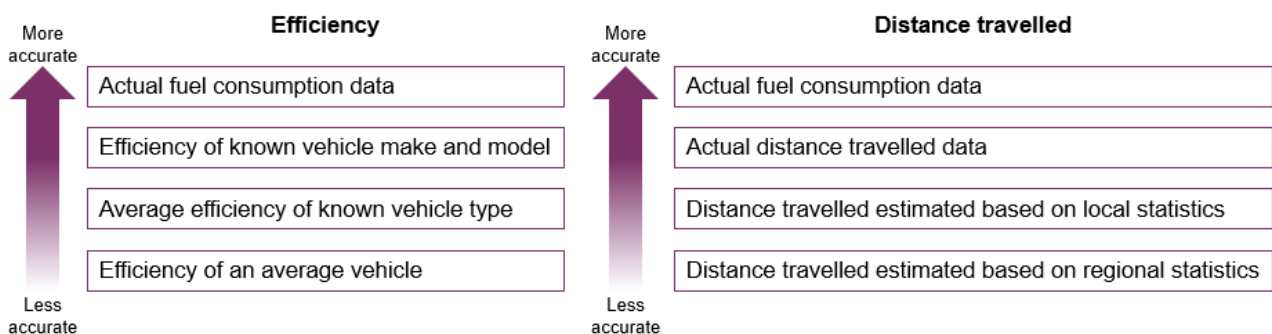


Figure 3

## Sovereign debt

$$\text{Financed emissions} = \sum_s \frac{\text{Outstanding amount}_s}{\text{PPP-adjusted GDP}_s} \times \text{Sovereign Emissions}_s$$

Where:

- $s$  is sovereign borrower
- $\text{Outstanding amount}_s$  is the outstanding debt;
- $\text{PPP} - \text{adjusted GDP}_s$  is Purchase Power Parity adjusted Gross Domestic Production;
- $\text{Sovereign Emissions}_s$  is the sovereign region's GHG emissions

Under this approach<sup>15</sup>, a sovereign is seen primarily as a national territory, and its direct (scope 1) GHG emissions are attributable to emissions generated within its boundaries. Similar to emissions classification of cities, scope 2 are emissions attributable to the purchase, in this case import, of electricity, steam, heat and cooling from outside the country territory. Finally, scope 3 emissions are related to all other (non-energy) imports from goods or services from outside the country territory as a result of activities taken place in the country territory.

The classification allows to account for a holistic view of a sovereign's responsibility in generating emissions within and outside its boundaries. In particular, the approach allows to account for:

- Production emissions as defined by UNFCCC national emissions inventory (scope 1)
- Holistic view of a sovereign's emissions activity (scope 1 + 2 + 3) as requested by the EU Sustainable Finance Disclosure Regulation (SFDR)

### Reporting portfolio emissions to CDP

The portfolio emissions metric should be disclosed by:

- ▼ Selecting 'Yes' in response to C-FS14.1 'Does your organization measure its portfolio impact on the climate?', column two;
- ▼ Selecting 'Portfolio emissions' in response to C-FS14.1, column three; and,
- ▼ Disclosing the metric in response to C-FS14.a Provide details of your organization's portfolio emissions in the reporting year.

Portfolio emissions should be disclosed in metric tons CO<sub>2</sub>e in column 2 (Portfolio emissions (metric unit tons CO<sub>2</sub>e) in the reporting year).

Column 3 (Portfolio coverage) should be used to disclose the percentage of your total portfolio that has been measured based on the portfolio value.

Column 4 (Percentage calculated using data obtained from clients/investees) should be used to disclose the percentage of emissions that have been calculated using primary data. The portfolio emissions calculation methodologies for each asset class allow the use of data from a hierarchy of possible sources. By using data sources higher in the hierarchy, a more accurate measurement of portfolio emissions can be made. Primary data obtained from clients and investees (e.g. reported company emissions, reported building energy consumption) sits at the top of the hierarchy,

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<sup>15</sup> PCAF (2022). "The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second Edition." <https://carbonaccountingfinancials.com/files/downloads/PCAF-Global-GHG-Standard.pdf>.



therefore this column seeks to capture how much primary data is used in calculating portfolio emissions, as opposed to modelled data and estimates.

Column 5 (Emissions calculation methodology) should be used to specify the calculation methodology used.

Column 6 (Please explain the details and assumptions used in your calculation) should be used to explain:

- ▼ The portfolios and asset classes included in the calculation, explaining why portfolios or asset classes have been excluded from the calculation;
- ▼ The Scopes considered when measuring emissions associated with assets in your portfolio;
- ▼ The approach taken to attributing emissions associated with assets in your portfolio;
- ▼ The sources of data if primary data was used in calculating portfolio emissions;
- ▼ The approach taken to modelling or estimating emissions when primary data was not used; and,
- ▼ Any assumptions used in the calculation.

If a specific standard or methodology has been followed (for example, PCAF) you should reference the standard or methodology in your explanation. If there are many different data sources and estimation methods used in the calculation for different portfolios and asset classes, you may want to provide the weighted data quality score<sup>16</sup> described by the Global Carbon Accounting Standard to allow easier comparisons of data quality.

### **Worked example of calculating and disclosing portfolio emissions**

Throughout this technical note, worked examples demonstrate the methodologies using simplified portfolios including only a few assets. It is recognized calculations for actual financing portfolios will be much more complex.

Consider a bank with a portfolio consisting of corporate loans, residential mortgages and consumer lending:

Asset class	Outstanding amount
Corporate loans	\$650,000,000
Mortgages	\$300,000,000
Consumer loans	\$95,000,000
<b>Total</b>	<b>\$1,045,000,000</b>

The bank can calculate portfolio emissions for their corporate lending and mortgage portfolios.

#### **Corporate loans**

Their corporate loan exposure is to four borrowers, borrowers A and B are listed, while borrowers C and D are non-listed. Borrowers A, B and C have disclosed their Scope 1 and 2 emissions, while for borrower D emissions need to be estimated. Using the methodology for corporate loans the bank can calculate portfolio emissions as:

Borrower	Outstanding amount	Borrower EVIC	Borrower debt plus equity	Borrower disclosed emissions (tCO <sub>2</sub> e)	Borrower estimated emissions (tCO <sub>2</sub> e)	Portfolio emissions (tCO <sub>2</sub> e)
A	\$150,000,000	\$1,000,000,000	-	500	-	75
B	\$350,000,000	\$900,000,000	-	120	-	46.667
C	\$75,000,000	-	\$500,000,000	430	-	64.5
D	\$75,000,000	-	\$475,000,000	-	110	17.368

<sup>16</sup> PCAF Global (2020). "The Global Carbon Accounting Standard for the Financial Industry. First version for stakeholder consultation," <https://carbonaccountingfinancials.com/files/downloads/PCAF-Standard-public-consultation.pdf>.



<b>Total</b>	<b>\$650,000,000</b>	-	-	-	-	<b>203.535</b>
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I.e. For borrower A the portfolio emissions calculation is:

$$\frac{\text{Outstanding amount}_A}{\text{EVIC}_A} \times \text{Company emissions}_A = \frac{\$150,000,000}{\$1,000,000,000} \times 500 = 75 \text{ tCO}_2e$$

### Mortgages

Their mortgage portfolio consists of 470 properties in two regions. They do not have actual emissions or energy consumption data on the properties due to privacy reasons, but can estimate emissions using the average energy consumption per floor area for residential properties and region-specific emission factors. The emission factor for region B is greater as the energy mix for the grid in that region results in higher emissions. Using the methodology for mortgages they can calculate portfolio emissions as:

Region	Properties	Floor area (M <sup>2</sup> )	Outstanding amount	Average annual energy consumption per floor area for residential buildings (MWh/M <sup>2</sup> )	Estimated energy consumption (MWh)	Emission factor (tCO <sub>2</sub> e/MWh)	Portfolio emissions (tCO <sub>2</sub> e)
A	250	10000	\$150,000,000	0.75	7500	0.002	15
B	220	9900	\$150,000,000	0.75	7425	0.003	22.275
<b>Total</b>	<b>470</b>	<b>19900</b>	<b>\$300,000,000</b>		<b>14925</b>		<b>37.275</b>

I.e. for Region A the portfolio emissions calculation is:

$$100\% \times \text{Energy consumption}_A \times \text{Emission factor}_e = 7500 \times 0.002 = 15 \text{ tCO}_2e$$

The total portfolio emissions reported in response to C-FS14.1a will be  $240.81 \text{ tCO}_2e = 203.535 + 37.275$ .

The calculation covers the corporate loan and mortgage portfolios but not the consumer lending portfolio (there is currently no methodology for calculating emissions associated with consumer lending). Therefore, they should report their portfolio coverage as  $91\% = (\$650,000,000 + \$300,000,000) / \$1,045,000,000$ .

The bank used data obtained from clients and investees in calculating the portfolio emissions of borrowers A, B and C; but not in calculating the portfolio emissions of borrower D as the borrower did not disclose emissions data. Nor did the bank use primary data in calculating portfolio emissions associated with their mortgage portfolio, instead they estimated emissions using average energy consumption per floor area for residential buildings. This means that in total, the percentage of emissions that have been calculated using data obtained from clients and investees is  $77\% = (75 + 46.667 + 64.5) / 240.81$ .

In explaining their calculation methodology, it will be important for the bank to explain:

- ▼ The calculation covers their corporate loan and mortgage portfolio but not consumer lending;
- ▼ Scope 1 and 2 emissions of their borrowers have been included, although not Scope 3;
- ▼ The data sources used for reported emissions data of borrowers A, B and C;
- ▼ The approach taken to estimating borrower emissions when primary data was not available (i.e. for borrower D) – whether emissions were estimated using physical activity-based modelling or economic activity-based modelling; and,
- ▼ The approach taken to estimating mortgage portfolio emissions using average energy consumption per floor area for residential buildings.

## b. Weighted average carbon intensity

<b>Description</b>	Portfolio's exposure to carbon-intensive companies, expressed in tons CO <sub>2</sub> e/Million revenue
<b>Industry activities</b>	Banks, Asset owners, Asset managers
<b>Asset classes</b>	Listed equity, listed bonds, corporate loans, private equity
<b>CDP question</b>	C-FS14.1b
<b>Pros</b>	<ul style="list-style-type: none"> <li>+ Can be easily applied across asset classes since it does not rely on equity ownership approach</li> <li>+ The calculation is fairly simple and easy to communicate to investors</li> <li>+ Allows for portfolio decomposition and attribution analysis</li> </ul>
<b>Cons</b>	<ul style="list-style-type: none"> <li>- Sensitive to outliers</li> <li>- Using revenue (instead of physical or other metrics) to normalize the data tends to favor companies with higher pricing levels relative to their peers.</li> </ul>

The TCFD recommends that asset owners and asset managers disclose the weighted average carbon intensity of their portfolios in tCO<sub>2</sub>e/Million revenue<sup>17</sup>. This metric normalizes each company's emissions by the company's revenue to obtain the carbon intensity of each individual holding; and then weights each holding according to the importance of the holding in the portfolio. If lots of the portfolio's overall investment is in carbon intensive companies, the weighted average carbon intensity will increase.

A primary benefit of this metric is that it does not rely on attributing emissions between the investors in the same company. The need to attribute emissions results in a variety of attribution approaches depending on the asset class for the portfolio emissions metric. Instead of attributing emissions, portfolio weights (the current value of the investment relative to the current portfolio value) are used, which means the same calculation can be used for listed equity, listed bonds, corporate loans and private equity. This in turn means the metric is fairly simple to communicate to investors.

### Weighted average carbon intensity calculation methodology

Across all the asset classes to which weighted average carbon intensity is applicable, the methodology remains the same:

$$\sum_{c=1}^C \frac{\text{Outstanding amount}_c}{\text{Current portfolio value}} \times \frac{\text{Company emissions}_c}{\text{Company revenue}_c}$$

Where:

- $c$  is an investee in a portfolio of investees from 1 ... C;
- Outstanding amount<sub>c</sub>** is the actual outstanding investment or loan amount in investee  $c$ ;
- Current portfolio value** is the total size of the investor's portfolio;
- Company emissions<sub>c</sub>** is the total accounted emissions of investee  $c$ ; and,
- Company revenue<sub>c</sub>** is the revenue of investee  $c$  for the reporting period.

<sup>17</sup> Task Force on Climate-related Financial Disclosures (2017). "[Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures.](#)"

Information on outstanding investment amounts and total portfolio value used for calculating portfolio weights should be at hand for all investors. Financing portfolios are dynamic, and it may make sense for financial institutions to correct the portfolio weights with a flow variable<sup>18</sup>.

As with the portfolio emissions metric, weighted average carbon intensity depends on good quality data or estimations on the GHG emissions of underlying companies within the portfolio. Therefore, all the same data challenges previously discussed are relevant when calculating the weighted average carbon intensity of a portfolio. The limitations should not deter financial institutions from attempting to calculate the metric if it is relevant and decision useful to their own portfolio. They should use the best quality data or estimations available from the hierarchy of possible data sources in Figure 1, and should engage with investees and clients to drive better disclosures on company emissions.

When establishing the emissions of companies within the portfolio, it is important to be clear which Scopes are considered. When weighted average carbon intensity was first defined by the TCFD, only Scope 1 and 2 emissions of the underlying portfolio companies were recommended to be included in the calculation. The formula easily extends to include Scope 3 emissions, although this increases the chances of double counting emissions across Scopes and is likely to exacerbate data limitations.

### **Reporting weighted average carbon intensity to CDP**

The weighted average carbon intensity metric should be disclosed by:

- ▼ Selecting 'Yes' in response to C-FS14.1 'Does your organization measure its portfolio impact on the climate?', column two;
- ▼ Selecting 'Other carbon footprinting and/or exposure metrics (as defined by TCFD)' in response to C-FS14.1, column three; and
- ▼ Disclosing the metric in response to C-FS14.b Provide details of the other carbon footprinting and/or exposure metrics used to track the impact of your portfolio on the climate, using 'Weighted average carbon intensity (tCO<sub>2</sub>e/Million revenue)' in column two.

The weighted average carbon intensity should be disclosed in column 3 (Metric value in the reporting year).

Column 4 (Portfolio coverage) should be used to disclose the percentage of your total portfolio that has been measured based on the portfolio value.

Column 5 (Percentage calculated using data obtained from clients/investees) should be used to disclose the percentage of the metric that has been calculated using data obtained from clients and investees, as opposed to using estimations and data modelling.

Column 6 (Calculation methodology) should be used to explain the calculation methodology used. Important things to explain are:

- ▼ The portfolios and asset classes included in the calculation, explaining why portfolios or asset classes have been excluded from the calculation;
- ▼ The Scopes considered when measuring emissions associated with assets in your portfolio;
- ▼ How the portfolio weights were constructed;
- ▼ The sources of data if primary data was used in calculating weighted average carbon intensity;
- ▼ The approach taken to modelling or estimating emissions when primary data was not used; and,
- ▼ Any assumptions used in the calculation.

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<sup>18</sup> As described in the portfolio emissions methodology for listed equity and listed bonds.

### Worked example of calculating and disclosing weighted average carbon intensity

Consider an asset manager with a portfolio consisting of listed equity, listed bonds and investments managed indirectly through other funds:

Asset class	Size
Listed equity	\$470,000,000
Listed bonds	\$630,000,000
Other funds	\$120,000,000
<b>Total</b>	<b>\$1,220,000,000</b>

The asset manager has calculated portfolio emissions for their listed equity and listed bond exposure.

#### Listed equity

Their listed equity exposure is to five issuers. Issuer A, B and E have disclosed their company's Scope 1 and 2 emissions, while for issuer C and D emissions need to be estimated. Using the methodology for weighted average carbon intensity the asset manager can calculate portfolio emissions as:

Issuer	Equity holding	Issuer disclosed emissions (tCO <sub>2</sub> e)	Issuer estimated emissions (tCO <sub>2</sub> e)	Issuer revenue	Weighted average carbon intensity (tCO <sub>2</sub> e/\$M revenue)
A	\$400,000,000	120,000,000	-	\$300,000,000,000	0.00015
B	\$30,000,000	88,000,000	-	\$200,000,000	0.01200
C	\$28,000,000	-	78,000,000	\$50,000,000	0.03971
D	\$7,000,000	-	55,000,000	\$900,000,000.00	0.00039
E	\$5,000,000	65,000,000	-	\$12,000,000	0.02462
<b>Total</b>	<b>\$470,000,000</b>	-	-	<b>\$301,162,000,000</b>	<b>0.07686</b>

I.e. For issuer A the portfolio emissions calculation is:

$$\sum_{c=1}^c \frac{\text{Outstanding amount}_c}{\text{Current portfolio value}} \times \frac{\text{Company emissions}_c}{\text{Company revenue}_c} = \frac{\$400,000,000}{\$1,100,000,000} \times \frac{120,000,000}{\$300,000,000,000} = 0.00015 \text{ tCO}_2 / \$M \text{ revenue}$$

#### Listed bonds

Their listed bonds exposure is to four issuers. Issuers A, B and D have disclosed their company's Scope 1 and 2 emissions, while for issuer C emissions need to be estimated. The weighted average carbon intensity methodology can be applied across asset classes, so the asset manager can use the same methodology for listed bond as they do for listed equity to calculate portfolio emissions:

Issuer	Bond holding	Issuer disclosed emissions (tCO <sub>2</sub> e)	Issuer estimated emissions (tCO <sub>2</sub> e)	Issuer revenue	Weighted average carbon intensity (tCO <sub>2</sub> e/\$M revenue)
A	\$350,000,000	1,150,000,000	-	\$2,500,000,000	0.14636
B	\$160,000,000	450,000,000	-	\$750,000,000	0.08727
C	\$60,000,000	-	350,000,000	\$12,000,000,000	0.00159
D	\$60,000,000	230,000,000	-	\$150,000,000,000	0.00008
<b>Total</b>	<b>\$630,000,000</b>	-	-	<b>\$165,250,000,000</b>	<b>0.23531</b>

The total portfolio emissions reported in response to C-FS14.1b will be  $0.31218 \text{ tCO}_2\text{e} / \$M \text{ revenue} = 0.07686 + 0.23531$

The calculation covers the listed equity and listed bonds portfolios but not investments managed indirectly through other funds. Therefore, they should report their portfolio coverage as  $90\% = (\$470,000,000 + \$630,000,000) / \$1,220,000,000$ .

The asset manager used data obtained from investees in calculating the carbon intensity of issuers A, B and E for listed equity, and issuers A, B and D for listed bonds; but not in calculating the carbon intensity of issuer C and D (listed bonds) and issuer C (listed equity) as these issuers did not disclose their company's emissions data. This means that in total, the percentage of the weighted average carbon intensity that has been calculated using data obtained from investees is  $87\% = (0.00015 + 0.01200 + 0.02462 + 0.14636 + 0.08727 + 0.00008) / 0.31218$ .

In explaining their calculation methodology, it will be important for the asset manager to explain:

- ▼ The calculation covers their listed equity and listed bonds portfolios but not investments through other funds;
- ▼ Scope 1 and 2 emissions of their borrowers have been included, although not Scope 3;
- ▼ The data sources used for reported emissions data; and,
- ▼ The approach taken to estimate company emissions when primary data was not available – were emissions estimated using physical activity-based modelling or economic activity-based modelling?

### c. Portfolio carbon footprint

<b>Description</b>	Total carbon emissions for a portfolio normalized by the market value of the portfolio, expressed in tons CO <sub>2</sub> e/Million invested
<b>Industry activities</b>	Banks, Asset owners, Asset managers
<b>Asset classes</b>	Listed equity, listed bonds, corporate loans, private equity, project finance, commercial real estate, mortgages, motor vehicle loans
<b>CDP question</b>	C-FS14.1b
<b>Pros</b>	<ul style="list-style-type: none"> <li>+ May be used to compare and benchmark portfolios</li> <li>+ Using the portfolio market value to normalize data is fairly intuitive to investors</li> <li>+ Allows for portfolio decomposition and attribution analysis</li> </ul>
<b>Cons</b>	<ul style="list-style-type: none"> <li>– Does not take into account differences in the size of companies (e.g. does not consider the carbon efficiency of companies)</li> <li>– Changes in underlying companies' market capitalization can be misinterpreted</li> </ul>

The portfolio carbon footprint metric takes the portfolio emissions metric already described and normalizes it by the market value of the portfolio to allow comparisons. The metric is expressed in tCO<sub>2</sub>e/Million invested. This makes the metric particularly useful for asset owners with a fixed amount of capital to invest, who are interested in the climate change impact of investing that capital through different investment managers. Likewise, it is useful for savers with a fixed amount of savings, who are interested in the climate change impact of how those savings are reinvested on the opposite side of their bank's balance sheet.

Since the starting point for calculating a portfolio's carbon footprint is to first calculate Scope 3 portfolio emissions, this metric is applicable across the same asset classes as the latter metric. In this technical note we list the asset classes covered by the [Global Carbon Accounting Standard](#) as applicable for the portfolio carbon footprint metric. As with portfolio emissions, emissions of the investees in the portfolio must be established and then allocated based on the proportional share

of the investment in the investee, with the exact method of allocation differing depending on asset class.

### **Portfolio carbon footprint calculation methodology**

As the methodologies for calculating portfolio emissions for each asset class have already been described, the formulas are not repeated here. Instead, one formula is provided which assumes portfolio emissions have already been calculated according to the methodologies described above.

$$\frac{(\sum_{i=1}^I \text{Portfolio emissions}_i)^*}{\text{Current portfolio value}}$$

Where:

- i*** is an investment in a portfolio of investments from 1 ... I;
- \*** denotes a term calculated according to the methodologies for calculating portfolio emissions;
- Portfolio emissions<sub>i</sub>*** is the Scope 3 portfolio emissions associated with investment *i*; and,
- Current portfolio value*** is the total size of the investor's portfolio.

If a financial institution has already calculated portfolio emissions, it is relatively simple and intuitive to calculate the portfolio carbon footprint, dividing by the total portfolio size in currency. It is important to note that for the metric to be a true reflection of the climate change impact per Million invested, the total value of the part of the portfolio which has been measured should be used.

Portfolio carbon footprint is measured at a fixed point in time and it is likely that the portfolio value at that point of time will be used for normalization. However, for financing portfolios which are very dynamic, if flow variables have been used to correct the ratios for attributing company emissions when calculating portfolio emissions<sup>19</sup>, it may be intuitive to use an average portfolio value over the reporting period.

As it is so closely related to the portfolio emissions metric, portfolio carbon footprint depends on good quality emissions data or estimations in the same way. All the same data challenges previously discussed are relevant. The limitations should not deter financial institutions from attempting to calculate the metric if it is relevant and decision useful to their own portfolio. They should use the best quality data or estimations available from the hierarchy of possible data sources in Figures 1, 2 and 3, depending on the asset class being measured.

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<sup>19</sup> As described in the portfolio emissions methodology for listed equity and listed bonds.



## Reporting portfolio carbon footprint to CDP

The portfolio carbon footprint metric should be disclosed by:

- ▼ Selecting 'Yes' in response to C-FS14.1 'Does your organization measure its portfolio impact on the climate?', column two;
- ▼ Selecting 'Other carbon footprinting and/or exposure metrics (as defined by TCFD)' in response to C-FS14.1, column three; and
- ▼ Disclosing the metric in response to C-FS14.b Provide details of the other carbon footprinting and/or exposure metrics used to track the impact of your portfolio on the climate, using 'Portfolio carbon footprint (tCO<sub>2</sub>e/Million invested)' in column two.

The portfolio carbon footprint per Million invested should be disclosed in column 3 (Metric value in the reporting year).

Column 4 (Portfolio coverage) should be used to disclose the percentage of your total portfolio that has been measured based on the portfolio value.

Column 5 (Percentage calculated using data obtained from clients/investees) should be used to disclose the percentage of the metric that has been calculated using data obtained from clients and investees, as opposed to using estimations and data modelling.

Column 6 (Calculation methodology) should be used to explain the calculation methodology used. Important things to explain are:

- ▼ The portfolios and asset classes included in the calculation, explaining why portfolios or asset classes have been excluded from the calculation;
- ▼ The Scopes considered when measuring emissions associated with assets in your portfolio;
- ▼ The approach taken to attributing emissions associated with assets in your portfolio;
- ▼ The sources of data if primary data was used in calculating portfolio carbon footprint;
- ▼ The approach taken to modelling or estimating emissions when primary data was not used; and,
- ▼ Any assumptions used in the calculation.

### d. Carbon intensity

<b>Description</b>	Volume of carbon emissions per million dollars of revenue (carbon efficiency of a portfolio), expressed in tons CO <sub>2</sub> e/Million revenue
<b>Industry activities</b>	Banks, Asset owners, Asset managers
<b>Asset classes</b>	Listed equity, listed bonds, corporate loans, private equity
<b>CDP question</b>	C-FS14.1b
<b>Pros</b>	<ul style="list-style-type: none"> <li>+ May be used to compare and benchmark portfolios</li> <li>+ Takes into account differences in the size of companies (e.g. considers the carbon efficiency of companies)</li> <li>+ Allows for portfolio decomposition and attribution analysis</li> </ul>
<b>Cons</b>	<ul style="list-style-type: none"> <li>- The calculation is somewhat complex and may be difficult to communicate</li> <li>- Changes in underlying companies' market capitalization can be misinterpreted</li> </ul>

The carbon intensity metric uses a different approach to normalizing portfolio emissions, normalizing by the revenue of the companies in the portfolio. This approach leads to a measurement of how efficient the portfolio is at producing units of output while generating less GHG emissions. The carbon intensity metric is expressed in tCO<sub>2</sub>e/Million revenue.

To calculate carbon intensity, financial institutions must attribute the emissions of the companies they invest in or lend to between the equity and debt owners of those companies, in a similar way to when calculating portfolio emissions. In addition, they must attribute the revenue of the companies they invest in or lend to between the equity and debt owners of those companies. There are different approaches to attribution depending on asset class. With this information, they can calculate the emissions of their portfolio relative to the revenue or economic output the portfolio produces. One advantage of this normalization approach is that it takes into account the carbon efficiency of the underlying companies.

### **Carbon intensity calculation methodology**

Below are the methodologies for calculating carbon intensity for each applicable asset class.

#### **Listed equity and listed bonds**

$$\frac{\sum_{c=1}^C \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{Company emissions}_c}{\sum_{c=1}^C \frac{\text{Outstanding amount}_c}{\text{EVIC}_c} \times \text{Company revenue}_c}$$

Where:

- c*** is an investee in a portfolio of investees from 1 ... *C*;
- Outstanding amount<sub>c</sub>*** is the actual outstanding amount in listed equity or bonds of investee *c*;
- EVIC<sub>c</sub>*** is the enterprise value including cash of investee *c*;
- Company emissions<sub>c</sub>*** is the total accounted emissions of investee *c*; and,
- Company revenue<sub>c</sub>*** is the revenue of investee *c* for the reporting period.

For listed equity and bonds, the attribution of emissions and revenue is according to the ratio of an investor's outstanding investment amount to the enterprise value of the company they are invested in. EVIC is the most natural measure to use for enterprise value, if available, as it ensures that exactly 100% of all investee's emissions and revenue will be attributed to the equity and debt holders as these jointly determine 100% of the company's EVIC.

For financial institutions which only invest in equity, attribution can instead be according to the ratio of outstanding amount in listed equity to total market capitalization. This follows the ownership approach and is aligned with financial reporting and consolidation rules.

Carbon intensity is calculated by dividing the total emissions attributed to the portfolio by the total revenue attributed to the portfolio.

As with all other carbon footprinting metrics, the emissions of the companies within the portfolio are a crucial component of the calculation. All the same data challenges previously discussed are relevant when calculating the carbon intensity of a portfolio. The limitations should not deter financial institutions from attempting to calculate the metric if it is relevant and decision useful to their own portfolio. They should use the best quality data or estimations available from the hierarchy of possible data sources in Figure 1, and should be clear which Scopes are considered.



When carbon intensity was first defined by the TCFD, only Scope 1 and 2 emissions of the underlying portfolio companies were recommended to be included in the calculation. The formula easily extends to include Scope 3 emissions, although this increases the chances of double counting emissions across Scopes and is likely to exacerbate data limitations.

### **Corporate loans and private equity**

$$\frac{\sum_{c=1}^C \frac{\text{Outstanding amount}_c}{(\text{EVIC}_c) \text{ or } (\text{Total company equity} + \text{debt}_c)} \times \text{Company emissions}_c}{\sum_{c=1}^C \frac{\text{Outstanding amount}_c}{(\text{EVIC}_c) \text{ or } (\text{Total company equity} + \text{debt}_c)} \times \text{Company revenue}_c}$$

Where:

<i>c</i>	is an investee in a portfolio of investees from 1 ... C;
<i>Outstanding amount<sub>c</sub></i>	is the actual outstanding amount in listed equity or bonds of investee <i>c</i> ;
<i>EVIC<sub>c</sub></i>	is the enterprise value including cash of investee <i>c</i> ;
<i>Total company equity + debt<sub>c</sub></i>	is the total equity and debt from investee <i>c</i> 's balance sheet;
<i>Company emissions<sub>c</sub></i>	is the total accounted emissions of investee <i>c</i> ; and,
<i>Company revenue<sub>c</sub></i>	is the revenue of investee <i>c</i> for the reporting period.

For corporate loans and private equity, the same principle is followed of attribution according to the ratio of an investor or bank's outstanding investment (loan) amount to the value of the company they are invested in (lending to). However, for non-listed companies, EVIC is not likely to be available due to a lack of information on market capitalization. In this case, the total balance sheet value expressed as the sum of total company equity and debt shall be used.

## **Reporting carbon intensity to CDP**

The carbon intensity metric should be disclosed by:

- ▼ Selecting 'Yes' in response to C-FS14.1 'Does your organization measure its portfolio impact on the climate?', column two;
- ▼ Selecting 'Other carbon footprinting and/or exposure metrics (as defined by TCFD)' in response to C-FS14.1, column three; and
- ▼ Disclosing the metric in response to C-FS14.b Provide details of the other carbon footprinting and/or exposure metrics used to track the impact of your portfolio on the climate, using 'Carbon intensity (tCO<sub>2</sub>e/Million revenue)' in column two.

The carbon intensity per Million revenue should be disclosed in column 3 (Metric value in the reporting year).

Column 4 (Portfolio coverage) should be used to disclose the percentage of your total portfolio that has been measured based on the portfolio value.

Column 5 (Percentage calculated using data obtained from clients/investees) should be used to disclose the percentage of the metric that has been calculated using data obtained from clients and investees, as opposed to using estimations and data modelling.

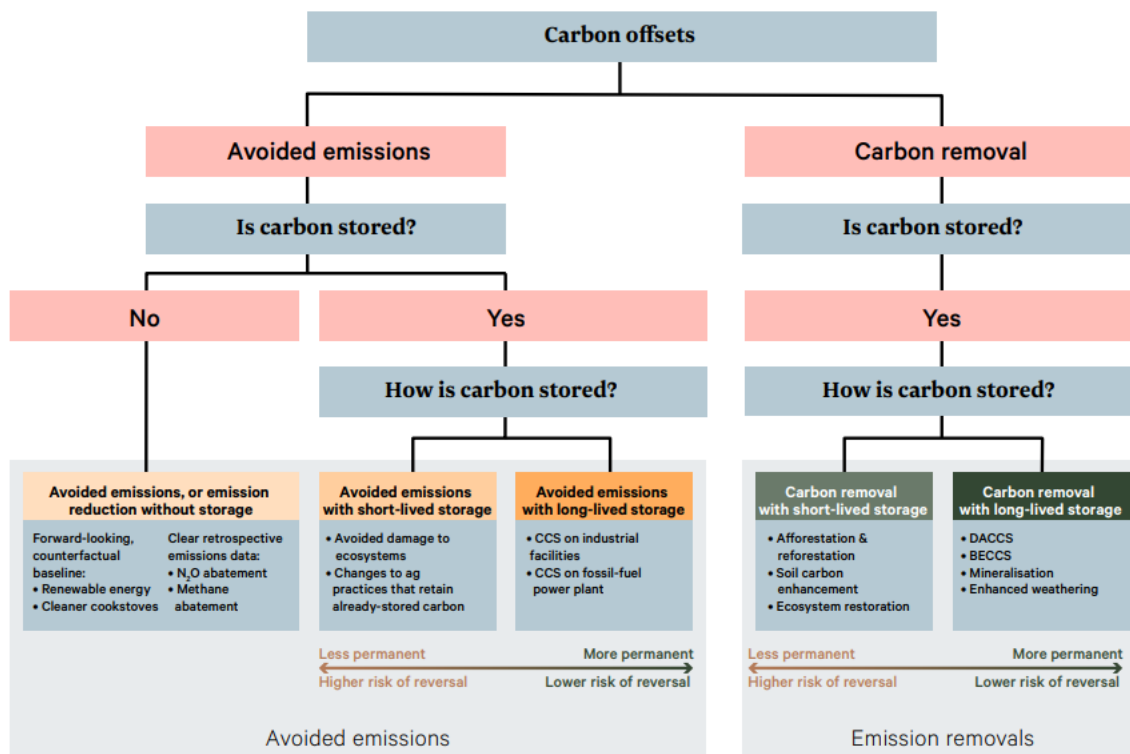
Column 6 (Calculation methodology) should be used to explain the calculation methodology used. Important things to explain are:

- ▼ The portfolios and asset classes included in the calculation, explaining why portfolios or asset classes have been excluded from the calculation;
- ▼ The Scopes considered when measuring emissions associated with assets in your portfolio;
- ▼ The approach taken to attributing emissions and revenue associated with assets in your portfolio;
- ▼ The sources of data if primary data was used in calculating carbon intensity;
- ▼ The approach taken to modelling or estimating emissions when primary data was not used; and,
- ▼ Any assumptions used in the calculation.

## **e. Avoided emissions and emission removals**

The second version of PCAF's Global GHG Accounting and Reporting Standard for Financed Emissions was launched in December 2022. It includes guidance on how to measure financed emissions related to GHG emission removals. We invite readers to consult that document as a supplement to this technical note.

PCAF emphasize that the distinction between avoided emissions and emission removals is important from an accounting perspective. They illustrate the differences in the figure below:



According to the [GHG Protocol's Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard](#) (page 107): “Any estimates of avoided emissions must be reported separately from a company’s Scope 1, Scope 2, and Scope 3 emissions, rather than included or deducted from the Scope 3 inventory”.

In the context of your CDP response, avoided emissions should be reported separately from any other carbon footprinting and/or exposure metrics used to track the impact of your portfolio on the climate in question C-FS14.1b.

### Reporting avoided emissions and/or emission removals to CDP

The avoided emissions and/or emission removals should be disclosed by:

- Selecting ‘Yes’ in response to C-FS14.1 ‘Does your organization measure its portfolio impact on the climate?’, column two;
- Selecting ‘Other carbon footprinting and/or exposure metrics (as defined by TCFD)’ in response to C-FS14.1, column three; and
- Disclosing the metric in response to C-FS14.b Provide details of the other carbon footprinting and/or exposure metrics used to track the impact of your portfolio on the climate, using ‘Avoided emissions financed (tCO<sub>2</sub>e)’ and/or ‘Carbon removals financed (tCO<sub>2</sub>e)’ in column two.

The avoided emissions and/or emission removals in tCO<sub>2</sub>e should be disclosed in column 3 (Metric value in the reporting year).

Column 4 (Portfolio coverage) should be used to disclose the percentage of your total portfolio that has been included in the measurement. Coverage by portfolio value can be based on potential insurance liabilities, premiums and/or other. Please define this in column 6 “Calculation methodology”.

Column 5 (Percentage calculated using data obtained from clients/investees) should be used to disclose the percentage of the metric that has been calculated using data obtained from clients, as opposed to using estimations and data modelling.

Column 6 (Calculation methodology) should be used to explain the calculation methodology used, such as any assumptions used.

#### **f. Insurance-associated emissions**

<b>Description</b>	GHG emissions in the real economy, which are associated with specific re/insurance policies aggregated in the re/insurance portfolio. This definition is for accounting purposes only. It is not intended, and should not be interpreted as, an admission of liability by any re/insurer for any emissions caused, or contributed to, by an insured or an insured activity.
<b>Industry activities</b>	Insurers
<b>Asset classes</b>	Insurance underwriting
<b>CDP question</b>	C-FS14.1b
<b>Pros</b>	<ul style="list-style-type: none"> <li>+ A standardized way to measure and report the GHG emissions associated to re/insurance underwriting portfolios</li> <li>+ Addressing the issue of double counting by maintaining that the reporting of insurance-associated emissions remain a supplementary note to the financed emissions</li> </ul>
<b>Cons</b>	<ul style="list-style-type: none"> <li>– The first version of the Insurance-Associated Emissions Standard covers only two business segments</li> <li>– Reinsurance is excluded from the first version of the Insurance-Associated Emissions Standard</li> </ul>

For insurance underwriting, carbon footprinting metrics are in their infancy. A barrier to progress has been the issue of double counting. It is plausible that insurers count Scope 3 emissions on their underwriting portfolio but also count the same emissions on the other side of their balance sheet if the premiums received are invested in the same companies being covered. Until now, there has not been a globally accepted standard for measuring and reporting emissions associated with re/insurance underwriting portfolios (“insurance-associated emissions”). Responding to increasing demand from the insurance industry and other stakeholders, PCAF published the Global GHG Accounting and Reporting Standard for Insurance-Associated Emissions in November 2022. This new Standard constitutes Part C of PCAF’s Global GHG Accounting and Reporting Standard for the Financial Industry. As such, this standard supplements the requirements of the GHG Protocol “Corporate Value Chain (Scope 3) Accounting and Reporting Standard”.

It’s worth noting that disclosers should not aggregate financed emissions and insurance-associated emissions in their reporting. We quote PCAF: “For the avoidance of doubt, insurance-associated emissions and financed emissions are not, and are not intended to be, directly comparable. Insurance-associated emissions and financed emissions shall be reported separately and not, under any circumstance, aggregated under the GHG Protocol scope 3 category 15 (Investments). Insurance-associated emissions are a supplementary accounting note to the GHG Protocol scope 3 category 15 (Investments).”

It is the first version of the Insurance-Associated Emissions Standard and provides detailed methodological guidance for the measurement and disclosure of GHG emissions associated with two segments; commercial lines and personal motor lines. The next version of the Standard aims to address the issue of data availability and consistency across the entire re/insurance value chain, and define an attribution methodology for reinsurance associated with treaty reinsurance aligned with PCAF principles.

Note that this Insurance-Associated Emissions Standard is pending official GHG Protocol review and approval at the time of writing this Technical Note. Therefore, CDP will not dwell into any details or worked examples here – instead we refer directly to [PCAF’s Global GHG Accounting and Reporting Standard for the Financial Industry, Part C](#).

#### **Reporting insurance-associated emissions to CDP**

The insurance-associated emissions should be disclosed by:

- ▼ Selecting 'Yes' in response to C-FS14.1 'Does your organization measure its portfolio impact on the climate?', column two;
- ▼ Selecting 'Other carbon footprinting and/or exposure metrics (as defined by TCFD)' in response to C-FS14.1, column three; and
- ▼ Disclosing the metric in response to C-FS14.b Provide details of the other carbon footprinting and/or exposure metrics used to track the impact of your portfolio on the climate, using 'Insurance-associated emissions (tCO<sub>2</sub>e)' in column two.

The insurance-associated emissions in tCO<sub>2</sub>e should be disclosed in column 3 (Metric value in the reporting year).

Column 4 (Portfolio coverage) should be used to disclose the percentage of your total portfolio that has been included in the measurement. Coverage by portfolio value can be based on potential insurance liabilities, premiums and/or other. Please define this in column 6 "Calculation methodology".

Column 5 (Percentage calculated using data obtained from clients/investees) should be used to disclose the percentage of the metric that has been calculated using data obtained from clients, as opposed to using estimations and data modelling.

Column 6 (Calculation methodology) should be used to explain the calculation methodology used, such as any assumptions used.

### **g. Exposure to/value of carbon-related assets**

<b>Description</b>	The amount of carbon-related assets in the portfolio, expressed in Million or percentage of the current portfolio value
<b>Industry activities</b>	Banks, Asset owners, Asset managers, Insurers
<b>Asset classes</b>	Listed equity, listed bonds, corporate loans, private equity, project finance, insurance underwriting
<b>CDP question</b>	C-FS14.0
<b>Pros</b>	<ul style="list-style-type: none"> <li>+ Can be applied across industry activities and asset classes</li> <li>+ Does not rely on underlying companies' Scope 1 and Scope 2 GHG emissions</li> </ul>
<b>Cons</b>	<ul style="list-style-type: none"> <li>– Does not provide information on sectors or industries other than those included in the definition of carbon-related assets</li> <li>– Generally not used to compare portfolios if expressed in Million because the data are not normalized</li> </ul>

The science of climate change suggests the most natural way to measure climate impact is in terms of GHG emissions. However, that is not to say that every available portfolio impact metric is expressed in GHG emissions 'owned' by the portfolio, either in absolute or relative terms. The exposure to carbon-related assets metric is expressed in either currency or percentage of portfolio. It proxies for climate change impact by defining a population of carbon-related assets and measures exposure to that population across the portfolio.

The principal benefit of a simpler exposure metric is that it is much less demanding of data. The metric does not rely on the underlying companies' Scope 1 and 2 GHG emissions, hence many of the challenges of calculating carbon footprinting metrics are negated. With an exposure metric, there are no longer challenges with availability of accurate, verified emissions data; no longer modelling challenges with estimating company emissions; and no longer methodology challenges with attributing emissions between different debt and equity owners of the underlying companies. Financial institutions, especially those in markets with poorer disclosure standards, can calculate an exposure metric as a first step while they work to drive up disclosure in the market through their engagements.

Another benefit of a simpler exposure metric is that framing the metric in currency or percentage terms means it will likely be more familiar and digestible for financial institutions and providers of financial capital. The financial sector is used to dealing with metrics such as value-at-risk in monetary terms. It may be that financial institutions can reach similar answers on the actions required to make their portfolios compatible with net zero using an exposure metric, as opposed to when using a more data-dependant carbon footprinting metric.

While the exposure to carbon-related assets metric is not as dependant on data, it is dependant on an agreed taxonomy of what constitutes a carbon-related asset. The TCFD suggests defining carbon-related assets as those assets tied to the energy and utilities sectors under GICS, excluding water utilities and independent power and renewable electricity producer industries<sup>20</sup>. There are other possible definitions and have been numerous attempts to categorize economic activities that support or hinder climate change mitigation and adaptation, most notably the EU Taxonomy for Sustainable Finance<sup>21</sup>.

The trade-off associated with not using as much data in calculating exposure metrics is that the metric does not provide any information or insight on sectors or activities outside the definition of carbon-related assets, whichever taxonomy is used.

### **Exposure to/value of carbon-related assets calculation methodology**

As exposure to carbon-related assets can be either currency or percentage of portfolio, two formulas are presented for each asset class.

#### **Listed equity, listed bonds, corporate loans and private equity**

$$\begin{aligned}
 & \$M \quad \sum_{c=1}^c \text{Current value of investments in carbon related assets} \\
 & \% \quad \frac{\sum_{c=1}^c \text{Current value of investments in carbon related assets}}{\text{Current portfolio value}} \times 100
 \end{aligned}$$

Where:

- c* is an investee in a portfolio of investees from 1 ... C;
- Investments in carbon related assets** are investments in investees which fall within the definition chosen of carbon-related assets; and,
- Current portfolio value** is the total size of the investor's portfolio.

It should be relatively simple to calculate these metrics. The only requirements are an agreed taxonomy for what constitutes a carbon-related asset and a way of tracking which assets fall within the definition. For example, if calculating for a portfolio of corporate loans, it may be that a flag is used in the loan booking system to identify which loans are to companies that fall within the

<sup>20</sup> Task Force on Climate-related Financial Disclosures (2017). "[Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures.](#)"

<sup>21</sup> Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088, <http://data.europa.eu/eli/reg/2020/852/oj>.

definition. With the flag in place, the metrics could be extracted directly from the loan booking system.

**Project finance**

\$M 
$$\sum_{p=1}^P \text{Current value of investments in carbon related assets}$$

% 
$$\frac{\sum_{p=1}^P \text{Current value of investments in carbon related assets}}{\text{Current portfolio value}} \times 100$$

Where:

- p* is an project in a portfolio of projects from 1 ... *C*;
- Investments in carbon related assets** are investments in projects which fall within the definition chosen of carbon-related assets; and,
- Current portfolio value** is the total size of the investor’s portfolio.

For project finance, the methodology is almost identical, apart from now it is the sum of investments in carbon-related projects such as energy generation from fossil fuels. It is important to note that for the denominator, the value used is the part of the portfolio which is being measured, in this case the project finance portfolio. This results in a metric for the percentage of energy generation project finance portfolio which is non-renewable (vs renewable); which is routinely disclosed by banks.

**Insurance underwriting**

\$M 
$$\sum_{c=1}^C \text{Gross written premiums for carbon related assets}$$
  
or  
$$\sum_{c=1}^C \text{Sums insured for carbon related assets}$$

% 
$$\frac{\sum_{c=1}^C \text{Gross written premiums for carbon related assets}}{\text{Total portfolio gross written premiums}} \times 100$$
  
or  
$$\frac{\sum_{c=1}^C \text{Sums insured for carbon related assets}}{\text{Total portfolio sums insured}} \times 100$$

Where:

- c* is an insured company in a portfolio of companies from 1 ... *C*;
- Gross written premiums for carbon related assets** are premiums from companies which fall within the definition chosen of carbon-related assets;



<b><i>Sums insured for carbon related assets</i></b>	are sums insured for companies which fall within the definition chosen of carbon-related assets;
<b><i>Total portfolio gross written premiums</i></b>	is the total gross written premium across the entire insurance underwriting portfolio; and,
<b><i>Total portfolio sums insured</i></b>	is the total sums insured across the entire insurance underwriting portfolio.

Carbon footprinting metrics are in their infancy for insurance underwriting.

Despite carbon footprinting being difficult for insurance underwriting portfolios, it is possible for underwriters to use much simpler exposure metrics with an agreed definition of carbon-related assets. Disclosing something as simplistic as what percentage of the companies they insure are carbon-related provides some degree of information.

There are different KPIs which can be used for calculating the percentage of portfolio. Insurers could use gross written premiums, sums insured or other metrics, depending on data availability at company-level. There are advantages and disadvantages to each. For example, gross written premiums and sums insured have a reasonably homogenous application across the insurance industry so would lead to more comparable data, however data granularity issues may exist for gross written premiums and sums insured does not have a linear correlation to the actual risk.

### ***Reporting exposure to/value of carbon-related assets to CDP***

The exposure to (value of) carbon-related assets metric should be disclosed by:

- ▼ Selecting 'Yes' in response to C-FS14.0 For each portfolio activity, state the value of your financing and insurance of carbon-related assets in the reporting year, column two;
- ▼ Disclosing the metric in response to C-FS14.0 For each portfolio activity, state the value of your financing and insurance of carbon-related assets in the reporting year, using 'Value of the carbon-related assets in your portfolio (unit currency – as specified in C0.4)' in column 3 and 'Percentage of portfolio value comprised of carbon-related assets in reporting year' in column 6.

The value of carbon-related assets should be disclosed in column 3 (Value of the carbon-related assets in your portfolio (unit currency – as specified in C0.4)).

Column 4 (New loans advanced in reporting year (unit currency – as specified in C0.4)) should be used to disclose new loans advanced in reporting year.

Column 5 (Total premium written in reporting year (unit currency – as specified in C0.4)) should be used to disclose total insurance premium written in the reporting year.

### ***Worked example of calculating and disclosing exposure to/value of carbon-related assets***

Consider the same bank for which an example of portfolio emissions was provided [earlier](#). They can calculate the exposure to (value of) carbon-related assets (%) in their corporate loan portfolio. The portfolio is the same, although now it is important to note which of the borrowers falls within the definition of carbon-related assets. Using the TCFD definition, to note which of the borrowers operate in the energy and utilities sectors under GICS, excluding water utilities and independent



power and renewable electricity producer industries. Borrower A is an electric utility company so falls within the definition. The other borrowers do not:

Asset class	Outstanding amount
Corporate loans	\$650,000,000
Mortgages	\$300,000,000
Consumer loans	\$95,000,000
<b>Total</b>	<b>\$1,045,000,000</b>

Borrower	Carbon-related asset	Loan outstanding	Borrower disclosed emissions	Borrower modelled emissions
Borrower A	Yes	\$150,000,000	500	-
Borrower B	No	\$350,000,000	120	-
Borrower C	No	\$75,000,000	430	-
Borrower D	No	\$75,000,000	-	110
<b>Total</b>	-	<b>\$650,000,000</b>	-	-

The exposure to carbon-related assets (%) is:

$$\frac{\sum_{c=1}^c \text{Current value of investments in carbon related assets}}{\text{Current portfolio value}} \times 100 = \frac{\$150,000,000}{\$650,000,000} \times 100 = 23\%$$

The calculation covers the corporate loan but not the mortgage or consumer lending portfolios. Therefore, they should report their portfolio coverage as 62% = \$650,000,000/\$1,045,000,000.

Column 5 (Percentage calculated using data obtained from clients/investees) can be left blank.

In explaining their calculation methodology, it will be important for the bank to explain:

- ▼ The calculation covers their corporate loan portfolio but not others; and
- ▼ Which definition was used for carbon-related assets – here it was the TCFD definition.

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## 4. Breaking down portfolio impact metrics

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As well as calculating and disclosing portfolio impact metrics for their entire financing portfolio, financial institutions can also break down their portfolio impact to get more granular details on exactly where in their portfolio they face climate-related risks.

CDP requests portfolio impact breakdowns by asset class, industry, country/area/region and scope. It is worth noting there are other ways of breaking down portfolio impact metrics. For example, the TCFD recommends that in addition, banks break down metrics used to assess the impact of climate-related risks on their lending business activities by credit quality (e.g. investment grade or non-investment grade) and average tenor. PCAF recommends that emissions associated with loans and investments should be reported separately by Scope if it serves financial institutions' business goals (e.g. Scope 1 emissions of investees or Scope 2 emissions of investees).

Breakdowns are useful for financial institutions because more granular detail on where concentrations of carbon-related assets and climate-related risks exist in their portfolios will assist better decision making and portfolio management. As an example, carbon pricing and taxation regimes have so far been introduced by regulators in specific geographies. A breakdown of portfolio impact by country/area/region can inform financial institutions how they are exposed to changes in these regulations (increased carbon price) in a particular geography.

Breakdowns should be disclosed in the following questions:

- ▼ C-FS14.2a Break down your organization's Scope 3 portfolio impact by asset class;
- ▼ C-FS14.2b Break down your organization's Scope 3 portfolio impact by industry;
- ▼ C-FS14.2c Break down your organization's Scope 3 portfolio impact by country/area/region; and,
- ▼ C-FS14.2d Break down your organization's Scope 3 portfolio impact by scope.

Each question can be used to break down multiple portfolio impact metrics. You should add a row for each category in each metric breakdown<sup>22</sup>.

### *Worked example of breaking down and disclosing portfolio impact metrics*

The easiest breakdown to provide is by asset class, as most portfolio impact metrics are calculated on an asset class basis anyway. Therefore, the breakdown will likely be available from the calculation process. For this reason, the worked example provided is a breakdown by industry.

Consider the same asset manager for which an example of weighted average carbon intensity was provided [earlier](#). They wish to break down the carbon footprint of their portfolio (tCO<sub>2</sub>e/Million invested) by industry. The portfolio is the same, although now the industry of each issuer is important<sup>23</sup>. They are invested in the debt and equity of issuers in the materials and transportation sectors.

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<sup>22</sup> I.e. if you were breaking down portfolio emissions reported in C-FS14.1a and also breaking down weighted average carbon intensity reported in C-FS14.1b, both by asset class into listed equity and fixed income, there would be four rows in total.

<sup>23</sup> The industry drop-down options in C-FS14.2b are taken from GICS.

The first step in calculating portfolio carbon footprint is to calculate portfolio emissions:

Asset class	Size
Listed equity	\$470,000,000
Listed bonds	\$630,000,000
Other funds	\$120,000,000
<b>Total</b>	<b>\$1,220,000,000</b>

#### Listed equity

Issuer	Industry	Equity holding	EVIC	Issuer disclosed emissions (tCO <sub>2</sub> e)	Issuer estimated emissions (tCO <sub>2</sub> e)	Portfolio emissions (tCO <sub>2</sub> e)
A	Materials	\$400,000,000	\$1,000,000,000	120,000,000	-	48,000,000
B	Materials	\$30,000,000	\$360,000,000	88,000,000	-	7,333,333
C	Transportation	\$28,000,000	\$800,000,000	-	78,000,000	2,730,000
D	Materials	\$7,000,000	\$20,000,000	-	55,000,000	19,250,000
E	Transportation	\$5,000,000	\$25,000,000	65,000,000	-	13,000,000
<b>Total</b>	-	<b>\$470,000,000</b>	<b>\$2,205,000,000</b>	-	-	<b>90,313,333</b>

#### Listed bonds

Issuer	Industry	Bond holding	EVIC	Issuer disclosed emissions (tCO <sub>2</sub> e)	Issuer estimated emissions (tCO <sub>2</sub> e)	Portfolio emissions (tCO <sub>2</sub> e)
A	Materials	\$350,000,000	\$1,500,000,000	1,150,000,000	-	268,333,333
B	Transportation	\$160,000,000	\$900,000,000	450,000,000	-	80,000,000
C	Transportation	\$60,000,000	\$500,000,000	-	350,000,000	42,000,000
D	Transportation	\$60,000,000	\$800,000,000	230,000,000	-	17,250,000
<b>Total</b>	-	<b>\$630,000,000</b>	<b>\$3,700,000,000</b>	-	-	<b>407,583,333</b>

The asset manager can then calculate the portfolio carbon footprint for each industry by dividing the total portfolio emissions associated with that industry by the amount invested in that industry:

Industry	Total equity and bond holding	Portfolio emissions (tCO <sub>2</sub> e)	Portfolio carbon footprint (tCO <sub>2</sub> e/\$M invested)
Materials	\$787,000,000	342,916,667	435,726
Transportation	\$313,000,000	154,980,000	495,144

I.e. for the materials industry the portfolio carbon footprint calculation is:

$$\frac{\sum_{i=1}^I \text{Portfolio emissions}_i}{\text{Current portfolio value}} = \frac{342,916,667}{\$787,000,000,000} = 435,726 \text{ tCO}_2\text{e per } \$M \text{ invested}$$

In response to C-FS14.2b, the asset manager would add two rows, one for each industry. They would select the relevant industry in column 2, 'Portfolio carbon footprint (tCO<sub>2</sub>e/Million invested)' in column 3 and disclose the figures by industry in column 4.

In explaining their calculation methodology, it will be important for the asset manager to explain:

- ▶ The calculation covers their listed equity and listed bonds portfolios but not investments through other funds;
- ▶ Scope 1 and 2 emissions of their borrowers have been included, although not Scope 3; and
- ▶ The data sources used for reported emissions data; and,
- ▶ The approach taken to estimate company emissions when primary data was not available – were emissions estimated using physical activity-based modelling or economic activity-based modelling?

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## 5. Going further

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Calculating and disclosing portfolio impact metrics is not in itself an end-goal. The metrics requested by CDP quantify portfolio impact at one point in time only. It is the greening of the financial sector which will be instrumental in achieving the low-carbon transition. For most financial institutions, the journey starts with a high-level commitment to act through international initiatives such as the UNEP FI established frameworks for responsible investing, banking and insurance<sup>24</sup>. The next step, which has been the focus of this technical note, is the measurement of climate change impact. Financial institutions can go further once they have calculated portfolio impact metrics by using the metrics to set targets for reducing their climate change impact and to inform actions they can take to reduce their impact. Reporting on progress through effective environmental disclosures is important at every stage of the journey.

The obvious way for financial institutions to go further once they have calculated a portfolio impact metric is to set a target to improve the metric. Each of the metrics requested by CDP in module C14 could be used to construct a target for reducing the climate change impact of financial portfolios over time.

The gold standard for climate change targets are science-based targets. Targets 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. In 2022, the Science Based Targets Initiative released guidance and criteria on science-based targets for financial institutions<sup>25</sup>. One approach to target setting permitted under the criteria, the sector decarbonization approach, builds directly on the portfolio emissions metric requested by CDP in C-FS14.1a. We note here with respect to reporting financed avoided emissions and/or emission removals that, in line with science-based target setting, financial institutions should continue to prioritize reducing absolute financed emissions above other forms of mitigation, such as actions taking place beyond their value chains or those of their portfolio companies.

Financial institutions can report on their target setting to CDP in module C4.

Another way financial institutions can go further once they have calculated portfolio impact metrics is through third-party verification. For some time, verification of GHG emissions data has been best practice in environmental reporting as it increases the reliability of data and builds a strong reputation. For financial services sector companies, as the focus shifts onto the environmental impacts they finance in the wider economy, particularly their portfolio emissions, there will be interest in ensuring the reported metrics are accurate.

Financial institutions can report on their verification to CDP in module C10.

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<sup>24</sup> See the Principles for Responsible Investment: <https://www.unpri.org/>, the Principles for Responsible Banking: <https://www.unepfi.org/banking/bankingprinciples/> and the Principles for Sustainable Insurance: <https://www.unepfi.org/psi/>.

<sup>25</sup> SBTi (2022) "Financial Sector Science-based Targets Guidance," <https://sciencebasedtargets.org/resources/files/Financial-Sector-Science-Based-Targets-Guidance.pdf>.

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