The GLOBAL GHG ACCOUNTING & REPORTING Standard

PART C

New methods for public consultation

For financial institutions measuring and reporting scope 3 category 15 emissions

PCAF
Partnership for Carbon Accounting Financials

December 2024

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Foreword from the PCAF Board of Directors

This public consultation marks an important next chapter in PCAF's mission to address the complex, evolving needs of the financial industry through practical, industry-led methodologies that enable financial institutions to take meaningful and measurable steps to a lower carbon economy. From its inception, PCAFs focus has been rooted in the priorities expressed by the financial sector and its key stakeholders. In 2023, PCAF conducted an extensive survey of its signatories to identify the most pressing gaps in the Global GHG Accounting and Reporting Standard (the Standard). The survey results, complemented with inputs from key initiatives and stakeholders outside of PCAF, allowed the PCAF Core Team to select priority areas that align with the real-world reporting challenges faced by financial institutions. This engagement reflects our commitment to create standards that are not only technically rigorous but responsive and impactful to the needs of the industry.

Our efforts over the last year to expand and refine the PCAF Standard are the product of a rigorous and inclusive process. Over 100 experts from our signatory base contributed their expertise within structured working groups, led by the PCAF Core Team and PCAF's Technical Director. Together, they have safeguarded the foundational principles of the Greenhouse Gas Protocol (GHGP) while striving to expand its reach for modern instruments and practices. From methods assessing securitized and structured products to innovations like forward-looking emission metrics, these proposed methodologies reflect deep engagement, technical precision and above all else – a commitment to continuously improve industry standards.

Now we invite industry stakeholders to engage in a vital next step: public insight and feedback to finetune the collective work to this point.

This consultation presents an opportunity to shape standards that will have a lasting impact on the financial sector. Your perspectives will directly influence the final methodologies. By participating, you will contribute to establishing robust, credible and consistent GHG measurement tools that strengthen the sector's ability to transition to a lower carbon economy.

PCAF invites stakeholders from across the financial system to participate. Your contributions will help solidify and elevate the impact of these methodologies and ensure the Standard continues to meet the dynamic and evolving needs of the global sector.

We share our thanks in advance for your contribution as we work towards a more transparent, accountable and sustainable financial sector.

Signed, the PCAF Board of Directors

Acknowledgements

The Partnership for Carbon Accounting Financials (PCAF) would like to extend our heartfelt gratitude to all the individuals who contributed to the development of this public consultation.

Firstly, we extend our sincere appreciation and thanks to the PCAF Global Core Team, a group of individual representatives of PCAF signatories who govern the PCAF Standard. Your inputs, expertise, and leadership have been essential in ensuring the public consultation's development. We deeply appreciate your commitment and the time you've devoted to the expansion of the PCAF Standard.

The consultation on the Standard is led by the PCAF Global Core Team. In late 2023, the Core Team underwent a prioritization process to determine the areas to develop for this standard development cycle. The Core Team's contributions to this public consultation have been made on an individual rather than institutional level. The content set out within this public consultation and any views expressed do not necessarily represent the views of each individual Core Team member or the institutions they work for. Individuals who work at the following institutions make up the Core Team:

- Commonwealth Bank of Australia
- EIG
- HSBC
- ING
- Itaú Unibanco
- Metrics Credit Partners
- Mizuho Financial Group
- Morgan Stanley
- NMB Bank
- Nordea Group
- Phoenix Group
- PIMCO
- Swiss Re
- United Bank for Africa

We would also like to extend our deepest gratitude and appreciation to the over 100 industry experts from our signatory base who contributed their expertise within the Working Groups. The Working Groups underwent a rigorous drafting and review process throughout 2024 to deliver the guidance and methods presented in this consultation document. We are humbled and honoured by their unwavering dedication to PCAF. Thank you for being an integral part of this effort.

The PCAF Technical Director, together with the PCAF Secretariat facilitated the Core Team's work by moderating technical discussions, reviewing content, and compiling and editing this document. The PCAF Secretariat is operated by Guidehouse, a global consultancy firm specialized in energy, sustainability, risk, and compliance for the financial industry. Guidehouse serves as the Secretariat of PCAF, providing technical support to PCAF signatories in the development and implementation of the Global GHG Accounting and Reporting Standard for the Financial Industry.

In addition, we'd like to thank the PCAF Board of Directors for their efforts to convene the Core Team and for providing strategic guidance in the direction of the PCAF Standard's expansion. The current Board of Directors can be found on the PCAF website.

Finally, we want to thank Bloomberg Philanthropies, Sequoia Climate Foundation, Climate Arc, and the Laudes Foundation for their generous support of this work.

This document is open for public consultation until 28 February 2025.

1. Introduction

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Financials

The Partnership for Carbon Accounting Financials (PCAF) is an industry-led initiative that seeks to enable financial institutions (FIs) to consistently measure and disclose the absolute greenhouse gas (GHG) emissions associated with financial activities.

GHG accounting of financial products and services is the annual accounting and disclosure of scope 3 category 15 emissions at a fixed point in time in line with financial accounting periods. In November 2020, PCAF published the Global GHG Accounting and Reporting Standard for the Financial Industry ("the Standard"). Since then, banks and investors have asked to expand the standard with more methods, also covering other activities of the financial industry. From 2021 onwards, PCAF started the work on three parts under the umbrella of the Global GHG Accounting and Reporting Standard for the Financial Industry:

- Part A: update of the first version standard on measuring and reporting financed emissions, by adding a method for sovereign debt and guidance to account for emission removals ("Part A")
- Part B: development of a standard for measuring and reporting the GHG emissions associated to the capital market facilitation activities ("Part B")
- Part C: development of a standard for measuring and reporting the GHG emissions associated to re/insurance underwriting ("Part C")

The Standard is a response to industry demand for a global, standardized approach to measure and report emissions of financial activities. Written by a diverse, global team of FIs for FIs, the Standard combines deep industry insight with the rigor of the GHG Protocol, the supplier of the world's most widely used GHG accounting standards.

Global regulators and legislatures have started to acknowledge the PCAF Standard as a methodology of choice for complying with climate-related regulations:

- The Corporate Sustainability Reporting Directive (CSRD)'s reporting requirements include scope 1, 2, and 3 GHG emissions and thus financed emissions, and mandatory assurance. PCAF enables FIs to comply with this directive by providing a standardized methodology to measure financed emissions.
- The European Baking Authority's (EBA) Pillar 3 framework requires FIs to provide both qualitative and quantitative information to help market participants assess a bank's financial health risk and profile. EBA references PCAF as the methodology measure and disclose financed emissions.
- The disclosures of sustainability-related risks and opportunities for the audience of financial reporting are specified in ISSB's IFRS S2, including specific requirements for identification, measurement and disclosure of climate-related financial information. PCAF provides methodology to calculate financed emissions which are part of the requirement to report GHG inventory.

All in all, the uptake of PCAF globally and the continuous industry demand for methods that address all types of portfolios have led PCAF to draft additional methods. These new methods cover treaty reinsurance and project insurance. The following chapter describes them in detail.

The Working Groups, consisting of PCAF signatories, drafted these new guidance and methods following the Principles of the GHG Protocol's Scope 3 inventories: completeness, consistency, relevance, accuracy, and transparency. The methods are also meant to comply with the PCAF Standard requirements of recognition, measurement, attribution, data quality, and disclosure[1].

[1] For more information about these principles and requirements, see Figure 4-1 on page 36 of the Financed Emissions Standard – second version.

PCAF launched a public consultation of the new methods on 3 December 2024 and seeks feedback from all stakeholders, including FIs, regulators, policymakers, supervisors, data providers, consultants, and NGOs. The consultation will be open until 28 February 2025.

To participate in public consultation, stakeholders should follow the instructions on the PCAF website.

2. The new methods under public consultation

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2.1 Emissions associated with treaty reinsurance portfolios

Introduction

This method provides guidance for reinsurers on how to calculate the insurance-associated emissions of their reinsurance portfolios. It is also relevant for primary insurers choose to report their insurance-associated emissions net of reinsurance. Treaty reinsurance is defined by covering a large portfolio of similar insurable assets and is predominant in the global re/insurance market today. Treaty reinsurance is applied in most lines of business to transfer risk from a re/insurer to another. The proposed methodology leverages the existing Part C to the greatest extent possible. The aim is to avoid duplication of efforts and avoid double counting. The final version including feedback from the public consultation is intended to be added to Part C. This document also proposes changes to Part C.

Line of business scope

Treaty reinsurance is defined by covering a large portfolio of similar insurable assets with varying forms and structures. The reinsurer(s) agree(s) to automatically accept all risks from the primary insurer (also known as cedent or ceding company) that conforms with the conditions set out in the contract (i.e., line of business (LoB), jurisdiction, industry, sum insured, etc.). Treaty reinsurance contrasts with facultative reinsurance, where each insurable asset is underwritten and accepted or declined individually.

Treaty reinsurers are one step down the value chain from the insured asset than is the primary insurer. Therefore, reinsurers tend to have less control over the original insured assets and their associated emissions. However, the competition in the reinsurance market and the extent to which the primary insurer relies on reinsurers, determines the reinsurer's level of influence. The ability of a treaty reinsurer to control the business lies mostly on the level of the whole treaty as there is limited potential to negotiate specific terms (or to exclude certain individual reinsured assets, etc.). A treaty reinsurer typically has less data and transparency on the reinsured portfolio than the underlying cedent. Therefore, it is reasonable to allocate emissions on the level of the whole treaty, rather than for each of the individual risks covered by a reinsurance treaty.

This method covers the lines of business that are included in Part C. The attribution factor is calculated with a premium-based approach and follows the existing approach for commercial insurance. The method proposes two methods for doing this; the preferred method A when emissions data are available from the cedents, and a complementing method B for a reinsurer to estimate the emissions of a treaty when no data is available. When feasible, the preferred method using cedent emissions data can be applied to all lines of business, once further primary insurance methodologies have been developed.

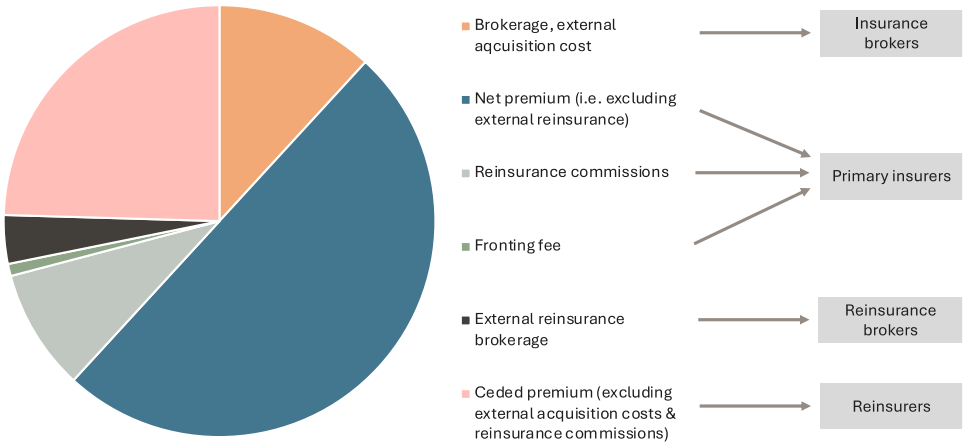
Emission scopes covered

The scope of the covered emissions shall follow the guidelines for the respective portfolio for primary insurance (see page 32 for commercial lines[2] and page 42 for personal motor[3] in Part C). When referring to GHG emissions or GHG emission intensity in the context of the primary insurance company, the term refers only to the insurance-associated emissions by the cedent.

Attribution of emissions

The treaty reinsurance method follows the same guiding principles adhered to for primary insurance, see 'Annex 4' in Part C. By obeying the "follow the risk principle", absolute emissions are allocated between primary insurers and reinsurers according to the respective risk they carry. The share of risk transferred can be approximated by the premium charged to cover the risks of a treaty reinsurance contract. Therefore, the premium received by the reinsurer(s), also known as the ceded premium and the total premium collected by the primary insurer, are used as the metrics to split insurance-associated emissions between the parties of a reinsurance contract. The approach could be extended to consistently allocate insurance-associated emissions among all the parties in the re/insurance value chain. Figure 2.11 depicts how a premium paid by an insured company is distributed to the providers of insurance services. The share of the total premium that each party in the re/insurance value chain has would determine the share of GHG emissions allocated to the respective party.

Figure 2.11. Breakdown of premium paid by an insured company across the re/insurance value chain can be used as a basis to consistently allocate emissions.



Remarks:

1. *The relative shares are only for illustrative purposes reflecting a portfolio with a large share of reinsurer participation. On a market level, actual retentions by P&C primary insurers are typically higher.*
2. *Reinsurance commissions are a payment of the reinsurer to the primary insurer to contribute to the latter's acquisition cost.*

[2] Re/insurers shall take into account customers' absolute scope 1 and scope 2 emissions across all sectors and should also take into account absolute scope 3 emissions to the extent that such numbers are available and represent reasonable and verifiable estimates.

[3] Annual scope 1 and scope 2 emissions of the vehicles.

3. *The fronting fee is similar to the reinsurance commission. It's paid in case of a fronting arrangement.* [4]

IMPLICATIONS FOR PRIMARY INSURANCE APPROACHES

A. *For transparency purposes and to avoid double counting between primary insurance, reinsurance and retrocession, re/insurance-associated emissions **shall** be reported both on a gross underwritten and a net-retained basis. If reporting is only on a gross basis (i.e., before external reinsurance), as per Part C, the emissions associated with the reinsurer are counted twice, i.e., by the insurer and the reinsurer:*
   1. Gross insurance-associated emissions: calculation based on gross written premiums (net of external costs/brokerage, but including commissions received, **prior** to external reinsurance/retrocession; see Figure 1).
   2. Net insurance-associated emissions: ceded insurance-associated emissions are **deducted** from gross insurance-associated emission. The former are calculated using **premiums ceded to external** reinsurers and reinsurance commissions received.[5]

B. *Establish the principle of "**sharing data along the value chain**": data shall be gathered, and absolute emissions should be calculated, where the transparency on the insured asset is the highest. This is typically the case at the institution, where the insurable asset enters the re/insurance value chain, i.e., the primary insurance agent/broker or primary insurer. The insurance-associated emission results shall be passed on within the value chain, including the underlying data, if needed for subsequent calculations. This principle will facilitate the adoption of GHG accounting and ensure consistency of assumptions.*

RATIONALE

Assuming full transparency and complete data (e.g., insured name, premium, limit for each policy ceded) on the reinsured portfolio, a reinsurer could theoretically calculate absolute emissions associated with commercial reinsurance portfolios for certain treaty reinsurance types. For example, for a proportional reinsurance treaty where premiums and claims for each risk in a portfolio are shared with the same pre-defined ratio, the required data may be available to the reinsurer. Absolute emissions could be calculated using the reinsurers' share of premiums per risk and aggregate this for the whole portfolio. For non-proportional per-risk reinsurance treaties[6] a bottom-up calculation is theoretically still feasible. For more complex structures, such as event-based or company-wide reinsurance covers, a bottom-up calculation would require a method to allocate premiums to individual policies, making the approach very complex and not feasible.

Since a treaty reinsurer steers business mainly on the level of whole treaties, it is consistent to allocate absolute emissions based on the total premium received for covering the risk of a treaty. An aggregate calculation is simpler, less data-intense, avoids the duplication of calculations efforts, and ensures consistency of reporting of the primary insurer and the reinsurer. Consequently, an aggregate approach relying on the calculations of the primary insurer is advisable.

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[4] Fronting is a business solution whereby an insurance company (Fronting Company) issues an insurance policy (Fronting Policy) on behalf of another risk carrier (which assumes the role of a reinsurer), such as another primary insurer, a reinsurance company, or a captive. The Fronting Company cedes such risk (usually 100%) to the reinsuring risk carrier. Although the actual exposure insured in the fronting policy is simply passed to the reinsuring risk carrier, the Fronting Company remains the legal risk carrier. The Fronting Company charges a fee for their fronting services and the assumption of the legal and some credit risk. Gross premium shall be used for the Fronting Policy because the Fronting Company as the legal risk carrier must disclose this business as part of its gross insurance activities. Insurer internal fronting arrangements should only be considered to the extent that the underlying emissions are only attributed once in order to avoid double counting between different entities of the same re/insurer.

[5] The emissions associated with treaty reinsurance exclude external reinsurance brokerage, while they are included in the ceded calculation to derive the net insurance associated emissions. This is on purpose, adding all net emissions of re/insurers, will exclude emissions associated with the share of brokers in overall premiums. This is correct as they should be ultimately reported by brokers.

[6] In such structures there is not a fixed or pre-determined split of premiums and losses for each asset covered.

Two complementary attribution calculation methods are proposed for treaty reinsurance arrangements. Method A is used for cases where the cedent publishes or provides GHG emission data. Method B provides a methodology to estimate emissions in absence of cedents data. At all times, method A is the preferred attribution option to be used, and method B should only be used when method A is not possible due to lack of data or other reasons.

Method A – Treaty-level GHG emission data available from cedent

RATIONALE

The guiding principle is that the additional required data for the calculation of attributable emissions for the whole treaty shall be handed down the insurance value chain, in addition to what is already being provided currently with risk profiles, premiums and loss history of a given treaty. Insurance-associated emissions calculated by the primary insurer (i.e. cedents) are directly used for calculating emissions associated with reinsurance treaties. This ensures consistency of calculations of primary insurers and reinsurers and reduces overall efforts.

PROPOSED FORMULA TO CALCULATE EMISSIONS ASSOCIATED WITH TREATY REINSURANCE PORTFOLIOS (LINE OF BUSINESS AGNOSTIC)

The formula to calculate insurance-associated emissions of a treat reinsurance contract is as follows:

$$RIAE_r = Attribution\ factor_r * Emissions_r\ (IAE_r)$$

Where *r* is the reinsured portfolio.

ATTRIBUTION OF EMISSIONS

$$Attribution\ factor_r\ (AF_r) = \frac{Ceded\ written\ premium_r\ (CPW_r)}{Gross\ written\ premium_r\ (PW_r)}$$

DEFINITIONS

$RIAE_r$ Emissions associated with the reinsurer for treaty portfolio *r*
IAE_r Insurance associated emissions of treaty portfolio *r*
CPW_r Ceded written premiums: premium ceded to reinsurer to cover the risks of treaty portfolio *r*
PW_r Gross written premiums of the primary insurer for risks in reinsured treaty portfolio *r*
AF_r Attribution factor for reinsured treaty portfolio *r*. The maximum value of the attribution factor is limited to 1.

1. **Treaty reinsurance:** Reinsurance arrangements, where the reinsurer is obliged to accept all the risks ceded within a pre-defined portfolio. Facultative reinsurance facilities shall also be included if there is an obligation of the reinsurer to accept all risks, and there is no individual assessment of each risk ceded.
2. **Emissions associated with the reinsured portfolio:** Emissions attributed to the primary insurer of the reinsured portfolio. Measured on a gross basis, i.e., before deducting the reinsurers' share of emissions. If emissions are unavailable for a portfolio, proxy data of the primary insurer can be used. Such proxy data may be the GHG emissions of the respective line of business or the total insurance-associated emissions of the primary insurer. For proxy data the respective gross written premiums shall be used to calculate the AF_r. However, it is important to note that since proxy data is generally less reliable and less representative of the cedent's decarbonization efforts, using it may result in a lower data quality score for the final calculated emissions value. This is explained in greater detail below in the data quality score sections of each methodology.

3. **Ceded written premium$_r$:** The amount paid by the insurance company (cedent) to a reinsurer to receive reinsurance coverage for a portfolio *r*. Net of external reinsurance brokerage. Reinsurance commissions the primary insurer receives from the reinsurer are deducted. For multi-year contracts an annualized premium value shall be used. The premiums exclude contingent premiums such as reinstatement premiums and are on an ex-ante costed basis.
4. **Gross written premium$_r$:** The amount paid by all insureds within a reinsured portfolio to receive insurance coverage. It is gross of any external reinsurance or retrocession but net of brokerage and of external commissions. For multi-year contracts an annualized premium value shall be used. The premiums exclude contingent premiums such as reinstatement premiums and are therefore on an ex-ante costed basis.

AGGREGATION APPROACH

- The approach can be used with multiple overlaying reinsurance structures. For example, a portfolio that is covered with proportional reinsurance in combination with a per risk non-proportional structure and a further event-based non-proportional catastrophe cover.
- The reinsurance company would need to aggregate the total premium received for the covered portfolios and the respective emissions. The overall ratio defines the reinsurers' share of absolute emissions.

ADVANTAGES

- Easy to calculate due to the aggregate approach, use of metrics that are available and shared between cedent and reinsurer (i.e., primary insurance premium, ceded premium). Furthermore, the insurance-associated emissions calculated by the primary insurer are reused.
- Can be universally applied to different lines of business and to complex reinsurance structures (proportional and non-proportional structures). It can also be applied to fronting solutions.
- Applying the principle to pass-down data along the value chain will ensure consistent emission calculations within the value chain while being cost-efficient and simple to apply.

DISADVANTAGES

- Reinsurers are dependent on their primary insurers being able and willing to provide insurance-associated emissions data aggregated for each reinsured portfolio.
  - Depending on underlying data sources there can be legal/contractual hurdles to share granular information.
  - Insurers take different approaches in terms of data capturing and estimation of emissions. This may limit the ability to compare individual treaties within a reinsurer as results will be influenced by insurance-associated emissions assumptions.
- Calculating insurance-associated emissions on treaty granularity goes beyond what insurers will disclose and audit as part of their regular emission reporting. The implications on reporting liabilities for the insurers and the ability of reinsurers to audit data are not clear.
- Using the total premium of a reinsurance treaty to determine the share of emissions that is allocated to the reinsurer can lead to understatement or overstatement of emissions of the reinsurer compared to a bottom-up approach, depending on the structure of the treaty portfolio, as seen in example 1.

EXAMPLES

Example 1: Understated ceded insurance-associated emissions

Risks with high emissions are less risky and pay, in comparison to revenues, a lower premium than risks with lower emissions. However, an insurer has less appetite for these risks and cedes a higher fraction of premium.

Bottom-up calculation

Risk	Emissions (tCO_2e) (a)	Revenues ($) (b)	Gross written premium ($) (c)	Insurance associated emissions (tCO_2e) (d = a*c/b)	Ceded written premium ($) (e)	Reinsurance-associated emissions (tCO_2e) (f = d*e/c)
1	100	100	20	20	10	10
2	20	100	80	16	10	2
Treaty total	120	200	100	36	20	12

Treaty level calculation	based on row 'Treaty Total'
Att. factor (= e/c)	20%
Insured emissions (d)	36
Ceded emissions	20% x 36 = 7.2

Example 2: Overstated ceded insurance-associated emissions

Risks with high emissions are riskier and pay, in comparison to revenues, higher premium than risks with lower emissions. However, an insurer has appetite for these risks and cedes a lower fraction of premium.

Bottom-up calculation

Risk	Emissions (tCO_2e) (a)	Revenues ($) (b)	Gross written premium ($) (c)	Insurance associated emissions (tCO_2e) (d = a*c/b)	Ceded written premium ($) (e)	Reinsurance-associated emissions (tCO_2e) (f = d*e/c)
1	100	100	80	80	5	5
2	20	100	20	4	15	3
Treaty Total	120	200	100	84	20	8

Treaty level calculation	based on row 'Treaty Total'
Att. factor (= e/c)	20%
Insured emissions (d)	84
Ceded emissions	20% x 84 = 16.8

Method B – No treaty-level emission data available from cedent: commercial lines covered by the insurance-associated emissions standard

RATIONALE

The primary insurance industry is only beginning to measure, analyse and report its insurance-associated emissions as data gradually becomes available. Progress in reporting is likely to vary between countries and regions. It will, therefore, take several years until the insurance-associated emissions for the reinsured treaty portfolios will become available to enable reinsurers to calculate their emissions.

To bridge the data gap to apply method A, an alternative top-down method calculation method is needed. This top-down option is based on the commercial lines portfolios attribution factor (see Chapter 5.2 of Part C). To calculate insurance-associated emissions, the economic GHG emission intensity (i.e., GHG emissions / revenue of the re/insured portfolio) and the premium received by the reinsurer are needed.

PROPOSED FORMULA

The formula to calculate insurance-associated emissions of a treat reinsurance contract is as follows,

$$RIAE_r = Premiums\ written\ received\ by\ the\ reinsurer\ to\ cover\ the\ risk\ of\ treaty\ portofolio_r(RCI_r) * Revenue\ based\ economoc\ emission\ intensity\ for\ reinsured\ treaty\ portfolio_r(CPW_r)$$

DEFINITIONS

$RIAE_r$ Emissions associated with the reinsurer for treaty portfolio *r*

CPW_r Ceded written premiums (see method A)

RCI_r Revenue based economic emission intensity for reinsured treaty portfolio *r*

For commercial re/insurance portfolios, this is consistent with Method A as can be seen:

$$RIAE_r = AF_r * IAE_r$$

$$AF_r = \frac{CPW_r}{PW_r}$$

$$RIAE_r = \frac{CPW_r}{PW_r} * IAE_r = \frac{CPW_r}{PW_r} * PW_r * RCI_r = CPW_r * RCI_r$$

Because $IAE_r = \frac{PW_r}{R_r} * E_r = \frac{PW_{ri}}{R_r} * RCI_r * R_r = PW_r * RCI_r$

Where:

PW_r Gross written premiums of the primary insurer for risks in reinsured treaty portfolio *r* (see also method A)

R_r Revenue of companies in reinsured portfolio *r* in millions

E_r Absolute emissions of the reinsurance treaty portfolio *r* in tons

RCI_r Revenue based economic emission intensity for a company *i*

The economic emission intensity *RCI_r* can be estimated using different approaches depending on the composition of the specific portfolio and the line of business. Since some reinsurance treaties cover a broad range of risks in one or several countries, using a country level emission intensity is a fair first approximation for GHG emissions. For portfolios with a specific industry composition, industry specific estimates should be used.

This approach can be applied to future methodologies for attribution factors that are based on the ratio of premiums to revenues.

Table 2.11. List of LoBs and data proxies for Method B.

Line of business	Type of primary insurer	Emission intensity proxy
Property **Liability** **Non-life accident** **Workers' comp** **Trade credit** **Cyber** **Multi-lines**	Nationally active	Gross output emission intensity[7] of the country where the primary insurance company is headquartered.
	Present in multiple markets	Premium weighted gross output emission intensity of the locations of assets/risks in the treaty portfolio.
	Cedent which shares treaty occupancy data with the reinsurer	Occupancy-weighted average intensity for issuers in the same occupancy.
	Prime insurers disclosing their portfolio insurance-associated emissions by their lines of business.	Emissions intensity for the cedent's LoB where the ceded treaty is coming from.
Agriculture	Nationally active	Revenue based emission intensity of the agriculture sector of the country where the primary insurance company is located.

AGGREGATION APPROACH

- The approach can be used with multiple overlaying reinsurance structures. For example, a portfolio that is covered with proportional reinsurance in combination with a per risk non-proportional structure and a further event-based non-proportional catastrophe cover.
- The reinsurance company would need to aggregate the total premium received for the covered portfolios and the respective emissions. The overall ratio defines the reinsurers' share of absolute emissions.

ADVANTAGES

- External and internal data should be readily available.
- Reinsurer remains in control of the emission calculation methodology.
- Emissions estimates possible in absence of cedent's data.

DISADVANTAGES

- Volatility of sectoral emission intensity data.
- Similar to method A, even with high quality emissions data, the top-down method in method B will differ from a bottom-up calculation that considers the details of each policy ceded into the treaty.

EXAMPLES

Example 3: Nationally active and globally active cedents

Cedent	Area(s) of coverage	Area scope 1 Emissions	Area weight of coverage in %	Area GDP	Area Gross output / GDP ratio	Cedent ceded premium
Cedent 1	Area A	V_1	100%	X_1	Y_1	Z_1
Cedent 2	Area A	V_1	W_1	X_1	Y_1	Z_2
	Area B	V_2	W_2	X_2	Y_2	

[7] To ensure consistency with industry specific emission intensities, the emission intensity for a country should be based on gross output (i.e., total emissions of a country / gross output of the country), rather than Gross Domestic Product (GDP). GDP is measuring value added, gross output minus cost of intermediary purchased goods and services, and therefor lower than gross output. Nevertheless, using GDP emission intensities could be more readily available and would still be a fair proxy to use to come up with a first estimate for treaty related IAE. Such estimates would overestimate absolute emissions.

Cedent 1 scope 1+2 insurance-associated emissions = $Z_1 \times \frac{V_1}{X_1 \times Y_1}$

Cedent 2 scope 1+2 insurance-associated emissions = $Z_1 \times \left(W_1 \times \frac{V_1}{X_1 \times Y_1} + W_2 \times \frac{V_2}{X_2 \times Y_2}\right)$

Example 4: Cedent which shares treaty occupancy data with the reinsurer

Treaty	Occupancy	Occupancy weight in treaty in %	Treaty ceded premium	Average occupancy scope 1+2 emissions intensity
Treaty A	Occupancy 1	W_1	X_1	Y_1
	Occupancy 2	W_2		Y_2
	Occupancy 3	W_3		Y_3
Treaty B	Occupancy 1	W_4	X_2	Y_1
	Occupancy 2	W_5		Y_2
	Occupancy 3	W_6		Y_3
	Occupancy 4	W_7		Y_4

Treaty A scope 1+2 insurance-associated emissions = $X_1 \times (W_1 \times Y_1 + W_2 \times Y_2 + W_3 \times Y_3)$

Treaty B scope 1+2 insurance-associated emissions = $X_2 \times (W_4 \times Y_1 + W_5 \times Y_2 + W_6 \times Y_3 + W_7 \times Y_4)$

Example 5: Primary insurers disclosing their portfolio insurance-associated emissions by their lines of business

Cedent	Treaty	Treaty / Cedent LoB	Cedent LoB emissions intensity	Cedent company-Wide portfolio scope 1+2 emissions intensity	Treaty ceded premium
Cedent 1	Treaty A	Property	X_1	Y_1	Z_1
Cedent 1	Treaty B	Cyber	X_2		Z_2
Cedent 2	Treaty C	Property	N/A	Y_2	Z_3
Cedent 2	Treaty D	Cyber			Z_4

Treaty A scope 1+2 insurance-associated emissions Option 1 = $X_1 \times Z_1$ or Option 2 = $Y_1 \times Z_1$

Treaty B scope 1+2 insurance-associated emissions: Option 1 = $X_2 \times Z_2$ or Option 2 = $Y_1 \times Z_2$

Treaty C scope 1+2 insurance-associated emissions = $Y_2 \times Z_3$

Treaty D scope 1+2 insurance-associated emissions = $Y_2 \times Z_4$

Note that for Treaties A and B, while both options are valid, they could potentially result in different data quality scores depending on the type of treaty and the data quality scores of the cedent. PCAF recommends the more granular method (Option 1) be used when there is sufficient data available, doing so may result in a better data quality score.

Reinsurers may be able to find the line of business emissions and/or emissions intensities in the sustainability reports, annual reports, universal registration documents or other similar reports published by the cedent if they are disclosing their insurance-associated emissions. Alternatively, the cedent may directly provide these figures to the reinsurer instead of providing treaty specific emission figures. Initially, the extent and granularity of disclosure is expected to vary across cedents. However, PCAF expects the disclosures to

become more aligned as more data becomes available and reporting becomes more standardized. In the future, third party data aggregators/providers may be able to collect and aggregate this information.

Method B – No treaty-level emissions data available from cedent: personal motor

RATIONALE

The rationale outlined in the section on commercial lines for method B also applies to personal motor insurance, but the approach needs to be slightly amended to ensure consistency with the method for primary insurance. The approach will be on a country-by-country level.

The top-down option, as mentioned here, is also based on the personal motor portfolios attribution factor (see Chapter 5.3 of Part C) and the cession rate as calculated in before mentioned formulas. However, the insurance-associated emissions can be calculated based on publicly available information, to the extent that detailed information is available. Since the amount of insurance-associated emissions is (strongly) dependent on the underlying sort of vehicle and type of fuel/electricity, it is logical to make use of detailed information where available. This makes the calculated insurance-associated emissions on an aggregate level more in line with the outcomes when available on an individual level.

PROPOSED FORMULA

For each country:

$$RIAE_r = Cession\ rate * Personal\ motor\ attribution\ factor * Emissions\ of\ insured\ vehicles\ within\ portfolio_P$$

Where:
Insurance-associated emissions calculated as, depending on the level of detail available for each country. For more details see page 47 option 3 in Part C.

- **Option 3: estimated vehicle-unspecific emissions and continental distance driven averages**, where emissions are calculated based on estimated vehicle distance travelled from continental-level official statistics and on the emission intensity of an unspecified vehicle (emission intensity for the actual vehicle or vehicle's make and model is unknown).
  - **Option 3a**: Vehicle emissions are calculated based on the emission intensity of an average vehicle type and/or fuel type (e.g., plug-in hybrid passenger car, diesel van, motorcycle) and **estimated vehicle distance travelled** from **continental-level statistical data**.
  - **Option 3b**: Vehicle emissions are calculated based on the emission intensity of an **average vehicle** (where the emission intensity for the vehicle type is unknown) and **estimated vehicle distance** travelled from **continental-level statistical data**.

ADVANTAGES

- By using detailed market information, the mismatch between the outcomes on an aggregate level compared to the aggregation of individual emissions can be reduced.
- Public information on statistics for the country on cars and greenhouse gas emissions and cedent information on the composition of the portfolio should be readily available.
- The reinsurer remains in control of the emission calculation methodology.

DISADVANTAGES

- The varying availability of detailed market information between sectors and/or countries can make comparisons difficult.
- The more details used, the more assumptions on for instance averages are being taken, which has the risk of too much volatility in results.

Data required

- **Option 1:** reported emissions
- **Option 2:** physical activity-based emissions **(not currently applicable)**
- **Option 3:** sector specific and sector agnostic economic activity-based emissions

REPORTED EMISSIONS (OPTION 1)

Commercial lines

Reported emissions directly from cedent (Option 1)

Where available PCAF recommends Option 1, using emissions data reported by the cedent in official filings, environmental reports or through brokers/cedent when underwriting the treaty. The most recently available data should be used with mention of data source, reporting period or publication date. The granularity and reporting period of the emissions data will be dependent upon the level of disclosure from the cedent. Where available treaty specific insurance-associated emissions should be disclosed by the cedent, otherwise the closest categorization of available emissions data. PCAF acknowledges that commercial insurance portfolios include listed and non-listed cedents, and that availability of reported data can be limited, especially for non-listed cedents. PCAF recognizes that emissions data may not be publicly reported at an entity level and is less likely to be reported at the treaty or class level.

SECTOR SPECIFIC AND SECTOR AGNOSTIC ECONOMIC ACTIVITY-BASED EMISSIONS (OPTION 3)

Sector specific economic activity-based estimation models

Cedents are only beginning to disclose their insurance-associated emissions data in official filings or through data providers. However, those that do may not be willing to share treaty level emissions and quality score data with reinsurers. To maximize the coverage of emissions data, the remaining gaps are often filled with estimations. If no data is available, estimation models consistent with the emissions from the primary business activity may be used. Unlike direct and facultative insurance, treaty reinsurance portfolios are unlikely to contain the physical output metrics required to use a physical activity-based emissions approach (Option 2). Hence, this methodology focuses on emission factors from revenue-based models (e.g., intensity-based, or environmental input-output models) as these have the advantage of requiring less detailed data from the re/insurer.

For sector-specific level proxies, PCAF recommends using official statistical data or acknowledged Environmental Extended Input-Output (EEIO) tables providing region- or sector-specific average emission factors expressed per economic activity (e.g., tCO_2e/€ of revenue or tCO_2e/€ of asset). Reinsurers should use emission factors as consistently as possible with the primary business activity of the reinsured assets, as far as this is known, but in a way that remains feasible given the large size of commercial lines portfolios covering multiple (granular) business activities. For example, for an insurance policy to a paddy rice farmer, the re/insurer should seek to find and use a sector-specific average emission factor for the paddy rice sector, not a general emission factor for the agricultural sector overall.

Examples of EEIO databases that can be used to obtain such emission factors are EXIOBASE, the Global Trade Analysis Project (GTAP), or the World Input-Output Database (WIOD). Sector-specific emission factors can also be replaced with values from linear regression models from databases containing company revenue and emissions, by sector and geographical region.

PCAF's emission factor database provides a large set of sector specific emission factors. This can help re/insurers get started with estimating the insurance-associated emissions of their commercial lines portfolios.

Sector agnostic economic activity-based estimation models

Where information on the underlying industry of a given portfolio is not available and cannot be reasonably assumed based on occupancy codes, industry classifications or class of business, then country level proxies should be used. These proxies should be production based GHG emissions within a country's territory, as consistent with the requirements of national inventories submitted to the UNFCCC. Alternatively, sector agnostic emissions factors may be taken from linear regression models from databases containing company revenue and emissions and geographical region.

Country level emissions economic intensity factors typically use GDP as a denominator (i.e., tCO_2e/GDP). These factors should initially be considered alongside some adjustment to reflect economic inflation, as appropriate. Such factors should be scaled to reflect the gross output using the ratio of gross output to GDP of a given territory in line with the consideration of corporate emissions factors that consider gross input in the form of revenues. To avoid double counting between entities within a given territory, PCAF recommends considering only scope 1 emissions.

The use of **sector agnostic economic** emissions factors assumes that the emissions intensity of economic output for a given country can be used as a proxy for the emissions intensity of an insurance portfolio with geographical scope within that country. Whilst corporate emissions factors consider sector specific averages, country level emissions factors consider production from individuals, corporate entities, and government entities. Based on this assumption, country level emissions intensity factors should only be used in the absence of any reasonable indicators of the underlying industries within a treaty reinsurance portfolio.

PCAF expects that the insurance-associated emissions for most commercial lines portfolios can be derived through either reported emissions directly from cedents (Option 1), occupancies/industry level proxies, or country level GDP proxies (Option 3). However, it allows the use of alternative options to calculate emissions if none of the three can be used or in the case that new options are developed. The reporting reinsurer shall always explain the reasons for using an alternative option if it deviates from the three options defined above.

DATA GRANULARITY

PCAF recognizes it can be more challenging to source treaty-level data compared to portfolio-level data or a sub-set of portfolio-level data as categorization by line of business, occupancy, or another appropriate category. The data granularity of insurance-associated emissions disclosed by the cedent will be dependent upon their internal categorizations. The reinsurer should then determine the most appropriate selection of categories provided to align them most appropriately with the treaty's composition.

Quality scoring (Commercial Lines)

Table 2.12. provides data quality scores for each of the described data options and sub-options (if applicable) that can be used to calculate the insurance-associated emissions for commercial lines portfolios.

Table 2.12. General description of the data quality score table for treaty commercial lines insurance

Data quality score	Options to estimate IAE	When to use each option (what data should be available)		
		Attribution factor	Emissions	Comments
Score 1 to Score 4	Reported treaty or LoB/Company level (minimal mismatch*) emissions (Option 1)	Ceded premiums written/ Premiums written	Insurance-associated emissions of premiums written are sourced from the cedent	Prime insurer weighted average quality score between 1 and 4 (inclusive)
Score 4				Prime insurer weighted average quality score of more than 4
	LoB/Company level (significant mismatch*) emissions (Option 1)			When there is a significant difference in the composition of the treaty being measured and the portfolio being used to approximate the treaty's emissions.
	Occupancies/ Industry level proxies (Option 3)	Ceded Premiums	Sector average emissions factor	When reinsurer receives occupancy/ industry breakdown from broker/cedents
Score 5	Country level Gross output proxies (Option 3)		Country average emissions factor	When reinsurer has no direct sources of emissions data

**In cases where there is a significant expected mismatch between the composition of a cedent's LoB/portfolio and treaty, and where the LoB/portfolio proxy is used to approximate the emissions of the treaty, PCAF requires reinsurers to assign it a quality score of 4 to account for this mismatch. Please refer to Box 2.12 for more details.*

The consultation proposes to add the following to Chapter 6 of Part C.

Box 2.11. Illustrative examples for calculating weighted data quality scores

It is likely that data quality will differ across lines of business, sectors, companies, and emission scopes. To disclose the best representation of data quality, the Standard requires that re/insurers normalize the data quality scores for each line of business or sector to the total premium.

The formula for calculating weighted averages for a line of business or sector is:

$$\frac{\sum_{i=1}^{n}[\boldsymbol{Ceded\ premium}]_i \times \boldsymbol{Data\ quality\ score}_i}{\sum_{i=1}^{n}[\boldsymbol{Ceded\ premium}]_i}$$

$$\boldsymbol{with\ i\ =\ insured}$$

An illustrative example of a re/insurers provision of reinsurance where all cedents share treaty emissions data with the reinsurer is provided below:

Line of Business	Company	[Ceded premium]	Attributed scope 1/2 absolute emissions (tCO2e)	Data quality score (1 = High, 5 = Low)
Property	Cedent A	X_1	Y_1	Z_1
Property	Cedent B	X_2	Y_2	Z_2
Property	Cedent C	X_3	Y_3	Z_3
Casualty	Cedent A	X_4	Y_4	Z_4
Casualty	Cedent B	X_5	Y_5	Z_5
Casualty	Cedent C	X_6	Y_6	Z_6

Weighted data score for the Property and Casualty lines of business scope 1 and 2 emissions:

$$\frac{(X_1 \times Z_1) + (X_2 \times Z_2) + (X_3 \times Z_3) + (X_4 \times Z_4) + (X_5 \times Z_5) + (X_6 \times Z_6)}{(X_1 + X_2 + X_3 + X_4 + X_5 + X_6)}$$

Another illustrative example of a re/insurers provision of reinsurance where cedents A and B share treaty emissions data with the reinsurer, but cedent C does not is provided below.

Cedent ceded treaty quality scores

LoB	Cedent A	Cedent B	Cedent C
Property	2.6	3.9	Cedent C does not share treaty level info. Reinsurer has used country level proxy to estimate its insurance-associated emissions.
Casualty	4.5	1.6	

Reinsurer quality score calculation

Line of Business	Company	[Ceded premium]	Attributed scope 1/2 absolute emissions (tCO_2e)	Data quality score (1 = High, 5 = Low)
Property	Cedent A	X_1	Y_1	2.6
Property	Cedent B	X_2	Y_2	3.9
Property	Cedent C	X_3	Y_3	5
Casualty	Cedent A	X_4	Y_4	4
Casualty	Cedent B	X_5	Y_5	1.6
Casualty	Cedent C	X_6	Y_6	5

Weighted data score for the Property and Casualty lines of business scope 1 and 2 emissions:

$$\frac{(2.6X_1) + (3.9X_2) + (5X_3) + (4X_4) + (1.6X_5) + (5X_6)}{(X_1 + X_2 + X_3 + X_4 + X_5 + X_6)}$$

Box 2.12: Examples of minimal and significant mismatches between a cedent's LoB/Portfolio and a ceded treaty.

PCAF acknowledges the fact that the composition of a treaty from a cedent may or may not always be aligned with the line of business / portfolio of the cedent. Hence PCAF proposes that reinsurers account for treaties with a different data quality score when the degree of mismatch becomes significant. It is up to every reinsurer individually to ultimately determine, on an independent basis, what is considered a significant or minimal mismatch. However, PCAF has provided some examples which could illustrate common examples of good and bad matches between sources of cedent data and the treaty being measured.

Minimal mismatch examples

Underlying source of cedent emissions data	Treaty being measured
The emissions/emissions intensity of the property line of business of a cedent.	A general property treaty.
The emissions/emissions intensity of the company-wide portfolio of a cedent that only does property covers.	A general property treaty.
The emissions/emissions intensity of the property line of business of a cedent.	A natural catastrophe property cover treaty (global cat cover aligned to the activities of the cedent)
The emissions intensity of the property line of business of a cedent.	A property treaty with a significant amount of personal property coverage within the treaty (at the time of the standard, personal lines property contracts are not included within PCAF's scope).

Significant mismatch examples

Underlying source of cedent emissions data	Treaty being measured
The emissions/emissions intensity of the property line of business of a cedent.	A natural catastrophe property cover treaty (e.g., regional or sector specific coverages)
The emissions/emissions intensity of the property line of business of a cedent.	A property treaty with a focus on the power sector.
The emissions/emissions intensity of the company-wide portfolio of a cedent that is involved in multiple lines of businesses.	A general line of business specific treaty (e.g., property, aviation, marine, etc.)
The absolute emissions of the property line of business of a cedent.	A property treaty with a significant amount of personal property coverage within the treaty (at the time of the standard, personal lines property contracts are not included within PCAF's scope).

Table 2.13. General description of the data quality score table for treaty motor lines insurance (score 1 = highest data quality; score 5 = lowest data quality)

Data quality score	Options to estimate IAE	When to use each option (what data should be available)		
		Vehicle usage data	Emissions	Comments
Score 1 to Score 5	Reported emissions (received directly from cedent)	Total emissions per what is disclosed/shared by the cedent.		
Score 4	Estimated vehicle-unspecific emissions and continental distance driven averages	Estimated distance travelled of an average vehicle on the subcontinent / continent	Emission intensity of an average vehicle type (cars, vans, motorcycles) and/or fuel type (fossil fuel, hybrid, electric)	
Score 5			Average GHG emissions per car x numbers of cars insured	
		Total GHG emissions in Motor industry x (number of cars insured / total number of cars in the country)		

WHAT TO DO IF A REINSURANCE TREATY ALSO COVERS LINES OF BUSINESS THAT ARE OUT OF SCOPE OF THE PCAF STANDARD?

Often reinsurance treaties will cover both lines of business which are in scope of Part C along those which are out of scope. For these cases the possible approaches to deal with this are shown in the figure below for method A and method B.

Approach	Options	Pros	Cons
Attribution method A: GHG emission data available from cedent	Approach 1: use overall ratio of ceded/gross premium to assign emissions	Data available Simple approach	Could lead to inaccurate assignment of emissions between primary and reinsurer for unbalanced portfolio
	Approach 2 (preferred, if data available): use the ratio of ceded/gross premium only for the business in scope of the standard	More accurate assignment of emissions between primary and reinsurer	Data may not always available in systems More complicated to calculate
Attribution method B: No data available by cedent	Approach 1: no reporting of emissions	Avoid reporting of inaccurate data	No GHG emission reporting possible until primary insurers provide data
	Approach 2 (suggested approach): estimate only for lines of business in scope of Insurance-Associated Emissions Standard	Alignment with primary insurance emissions Relatively accurate	Data availability More estimations needed (i.e., share of personal vs commercial lines Uncertainty around using economic intensities

Limitations

- Limitations of method A for commercial insurance apply, particularly the susceptibility to volatility of primary and reinsurance market pricing and the disadvantage of high-risk, but low carbon reinsurance portfolios.

- Calculation of attribution factor on treaty level can lead to differences with the results obtained with a bottom-up calculation. If risks with high and low emission volumes are ceded with very different shares and the respective insurance premium differ widely, the reinsured emissions calculated with the proposed approach could over or understating the actual ceded emissions (see example 1).

2.2 Emissions associated with project insurance

Introduction

The purpose of this method is to provide guidance to financial institutions (FIs) on how to calculate insurance-associated emissions for project insurance. Project insurance is included in Part C as 'Engineering Lines', including construction all-risk and engineering all-risk, and relates to projects which emit GHG emissions over their entire life-cycle.[8] Data on these lifecycle emissions are generally not available. Furthermore, construction covers may be characterized by a non-linear development of the exposures over the years, which further complicates the relevant allocation of emissions. Additional guidance on lifecycle emissions is therefore out of the scope of this method. The topic may be covered in the Standard in the future.

This methodology leverages existing guidance on commercial lines insurance and personal motor insurance, and where relevant provides a recap of key points, however further information can be found in Part C.

Line of business introduction

LINE OF BUSINESS OVERVIEW

Project insurance encompasses specific insurance products dedicated to covering various risks linked to the construction of a new physical infrastructure. The type of construction projects covered varies with simple buildings, large hospitals, roads and railways, underground structures, wet works, industrial plants of any sort, petrochemical plants, any type of power production plants, and all others both onshore and offshore. For the purpose of this methodology, project insurance is defined as being related to construction and engineering lines of business and is defined as including three main products, namely:

1. Construction all risk (CAR) and erection all risk (EAR) also called builder's risks or course of construction in some markets (referred to as CAR/EAR throughout this method),
2. Inherent defect insurance, also known as latent defects or decennial insurance (referred to as IDI throughout this method) and,
3. Surety (financial guarantees of the contractor securing the good completion of the project).

The purpose of these products is to cover material damages occurring during the construction of a project (CAR/EAR), material damages occurring to newly constructed structures until typically 10 years after completion and due to construction defects (IDI), financial guarantee of the contractor securing the good completion of the project (surety), all with specific extensions and exclusions. Each product has its own rules, regulations, and wordings, each charging its own premium and being exposed to its own losses, usually handled by specific teams in each insurance company.

This methodology aims to encapsulate as many of the lines of business, products, contract types, and periods of cover as possible, whilst streamlining the calculation process for clarity and ease of use. It is noted however, that for some products different requirements may be needed and requiring different methodologies. As such, surety is out of scope of the current version of Part C, and this methodology, as the 3-way relationship is materially different to other Property and Casualty (P&C) products covered. As outlined

[8] The Global GHG Accounting & Reporting Standard Part C, page 30.

in Chapter 4.2 of Part C, credit re/insurers may have comparable rights to financing institutions under specific constellations. Surety has a direct link to products covered under Part A and therefore should be considered differently.

LINE OF BUSINESS DEFINITION

The purpose of this methodology is to assess the insurance-associated emissions of each product (scope 3 emissions of the insurance activity) and propose solutions to calculate the emissions.

Having considered all relevant lines of business, this method has narrowed its definition of the project line of business to the following:

Construction all risks, erection all risks, builder's risks, course of construction (CAR / EAR)

This product covers physical damage to construction works from the first occupation of the site until handover to the owner. It covers all types of physical damage affecting the project. CAR refers to covering static structures (buildings, roads, wet works, etc.), whereas EAR refers to covering structures including a process and testing aspect (industrial plants, petrochemicals, power production infrastructures, etc.). An extension can be given for third party liability, delay in start-up, existing property, Defect liability during the maintenance period, contractors' plants and equipment within the same insurance contract. The majority parties of the construction tasks are covered: the owner/principal, the contractors, and the sub-contractors.

The cover is purchased via OCIP (owner controlled insurance program, i.e., the owner is paying the premium) or CCIP (contractor controlled insurance program, so the contractor is paying the premium).

The cover is delivered on a project per project basis (valid for single project covers or for risk attaching programs), or on a loss occurrence basis (valid for "turnover" annually renewing contracts where no detailed list of projects is given).

Inherent defect insurance, latent defect, decennial liability (IDI)

This product covers physical damage to new-built structures caused by defects in design, workmanship, or materials for a period of (usually) 10 years from practical completion.

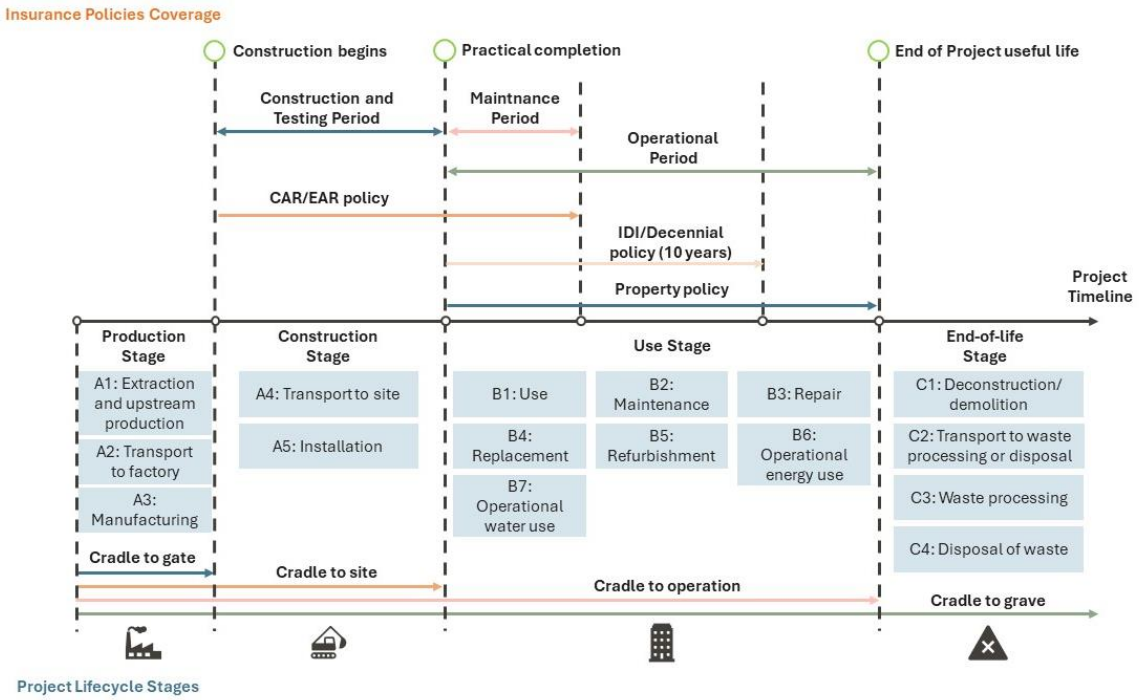
The limit of indemnity is usually the total construction cost of the insured structure.
It is a compulsory cover in some countries and some occupancies, whereas it is a good cover to have for others.

It encompasses two main types of policies:

- First-party policies (IDI, LD, dommage ouvrage etc) are purchased by the owner/principal or by the contractor on behalf of the owner. Such policies are purchased on a "per project" basis. Extensions can be given, for example, third-party liability as well as other extensions.
- Third-party policies (decennial liability) are only available in a limited number of countries where they are compulsory. The cover is purchased by the contractor, or occasionally by the owner on behalf of the contractor. Such policies can be purchased on a per-project basis or, in some countries, on an annual basis.

For both CAR/EAR and IDI, the premium rate of the insurance contract is applied to the total insured value for the project and to the turnover of the activity covered for annuals.

Figure 2.21. Illustration of in-scope project-related insurance policies and their relationship with the overall lifecycle of a project.[9]



Emissions introduction

EMISSIONS OVERVIEW

To understand the emissions that could be accounted for in this methodology, Part A and the GHG Protocol's Technical guidance for calculating scope 3 emissions were reviewed. The 'Project finance' asset class in Part A accounts for emissions from the lifetime of the projects if the reporting company is an initial sponsor or lender of a project. For this methodology and aligning with Figure 2.21, lifetime is inferred as the construction stage and use stage. The methodology states that initial sponsors or lenders should account for the total project lifetime for scope 1 and 2 emissions. As the concept of initial sponsor or lender does not translate directly into an insurance context, additional considerations were needed around which insurance products a lifecycle or construction emission-only approach is more appropriate. The lines of business already included in Part C were additionally considered, as the emissions emitted once a project is completed are covered under the commercial lines methodology for property and liability lines.

According to the project finance calculation standard of the GHG Protocol, initial sponsors/lenders only account for a share of total life-time emissions, in line with their share of total financed project costs. However, it is unclear how the "share of total project costs" would translate to an insurance context. Large infrastructure projects are usually insured by a panel of multiple insurers, with shares of premium and sums insured not necessarily known due to competitive and anti-trust considerations. Therefore, an alternative option for attribution is proposed as part of this method.

[9] Sources: Insurance Policies Coverage – Swiss Re Paper. Project Lifecycle Stages – ISO 21930:2017 Sustainability in buildings and civil engineering works https://www.iso.org/standard/61694.html

An additional consideration when accounting for emissions from the lifecycle of a project is the reporting period to which they would align. Comparing to commercial lines, the emissions for the specific contract year are used in calculating and reporting emissions, which generally aligns with the annual premium paid. However, the premiums for project insurance are not always annual and in the specific case of IDI polices the exposures exist for much longer periods. When comparing to project finance, the sponsor/lender would continue to receive yearly payments for their involvement in the project, which aligns with lifetime emissions and provides a connection throughout the project lifetime. However, for project insurance premiums are generally agreed at the outset of a project, or during the construction period, meaning revenues only occur during the construction period and are not generated throughout the lifetime of the project. This creates a misalignment between finance, insurance and the revenues generated and then the emissions being reported.

There is also the question of how much control insurers would have over the lifetime of a project, with potential changes in use or different stages of a project lifecycle generating differing levels of emissions. This could include changes to green projects such as hydro power, that add a different perspective highlighting another topic of discussion; avoided emissions. For example, hydro power is expected to be lower emitting than traditional electricity during its lifetime, however emissions during the construction phase can be higher than the construction of traditional gas plants. For the purpose of this methodology, calculating such avoided emissions may be undertaken in accordance with existing PCAF guidance.

In addition to the question of lifetime emissions, consideration was given to embodied emissions. Data proves to be a challenge as separate emissions factors would likely be required and embodied emissions would not be accounted for within reported project emissions. As such, whilst their importance is recognized, a wholesale review of their calculation across all areas of finance and insurance is required. Embodied emissions are therefore out of scope of this methodology. Additional guidance may be expected in future versions of the Standards.

EMISSIONS COVERED

Construction emissions (scope 1 and 2, reported as scope 3 of the insurance activity) **shall** be reported for all project insurance lines of business covered by this methodology. The additional lifetime (use stage) emissions **may** be calculated in addition. If calculated, use stage emissions **shall** be reported separately from construction emissions. Accounting for construction (scope 1 and scope 2) emissions can be combined with other similarly calculated lines of business, for example under the commercial methodology.

Attribution of emissions

Table 2.21. Formulas to calculate emissions associated with project insurance portfolios

Contract type	
1. Project Policies for CAR / EAR and (3.) project-specific IDI. Also valid for Portfolios of Projects, by adding together several IAEs.	2. Annual Policies for CAR / EAR and 3. Annual basis IDI based on Insured Turnover.
Construction stage emissions	
$IAE = \frac{Premium}{Total\ Value} \times Emissions_{Project,Construction}$	$IAE = \frac{Premium}{Revenue_{Insured,Year}} \times Emissions_{Insured,\ Year}$
Use stage emissions	
$IAE = \frac{Premium}{Total\ Value} \times (Emissions_{Project,Use})$	Not realistic / feasible for annual covers

Definitions:	
$\boldsymbol{Premium}$	Gross written insurance premium written for the contract by the Insurer for its share
$\boldsymbol{Total\ Value}$	Total insured value of project(s)
$\boldsymbol{Revenue_{Insured,Year}}$	Total revenue of the insured contractor or construction expense of the insured principal for the year of the contract
$\boldsymbol{Emissions_{Insured,\ Year}}$	Total emissions of the insured client for the year of the contract
$\boldsymbol{Emissions_{Portfolio,Construction}}$ $\boldsymbol{Emissions_{Project,Use}}$	Emissions of individual project or portfolios of projects over their entire Construction stage Emissions of project portfolio over its entire Use stage

1. **Project-specific policies (CAR / EAR)**[10]

Policies where premium is related to a specific project, meaning the insurer will (generally) have information on the individual project being undertaken. For project policies, the construction emissions of the insured project can be assumed to correspond to the emissions of the project over its entire construction stage.

2. **Annual premium policies (CAR / EAR)**

Annual premium policies do not cover specific, named, projects but any construction activities the insured undertakes during the contract period. The insurer will therefore have limited information on the individual projects the insured is undertaking. This type of policy can hence be equated to investments without known use of proceeds, which require different accounting methods than instruments where the use of proceeds is known.

The GHG Protocol's Technical guidance for calculating scope 3 emissions chapter 15 states: *"Calculating emissions from debt investments where the use of proceeds is not specified should use the methods described for equity investments"*.

[10] Risk attaching is not included as it is proposed to be a sum of the insurance-associated emissions of individual projects following the project methodology.

For annual policies, the construction emissions of the insured can be assumed to correspond to their annual reported emissions.

3. Inherent defects insurance (IDI)

The premiums for IDI policies can either be project-specific or on an annual basis. Annual premium policies do not cover specific, named, projects but any construction activities the insured undertakes during the contract period. The insurer will therefore have limited information on the individual projects the insured is undertaking. This type of policy can again be equated to investments without known use of proceeds, which require different accounting methods than instruments where the use of proceeds is known. The GHG Protocol chapter 15 states "Calculating emissions from debt investments where the use of proceeds is not specified should use the methods described for equity investments".

Formula applicable to all contract types.

EXAMPLES

All examples included are applicable to EAR / CAR and IDI lines of business. All values are illustrative for the purpose of the example.

Example 1: Single project and portfolio of projects policies

Project	Construction emissions of project	Total value of project	Premium of project (re)insurance
Project A	X_A	Y_A	Z_A
Project B	X_B	Y_B	Z_B
Project C	X_C	Y_C	Z_C
Total	X_{TOTAL}	Y_{TOTAL}	Z_{TOTAL}

Single project policy:

When the re/insurance policy covers only a single construction project, the IAE of the policy is calculated as:

$$IAE_{Project\ A} = \frac{Premium}{Total\ value} \times Emissions_{Project,Construction} = \frac{Z_A}{Y_A} \times X_A$$

Portfolio of projects – with breakdown:

When the re/insurance policy covers multiple specific projects, whenever possible, the IAE of the policy should be calculated as the sum of the IAEs of the individual projects:

$$IAE_{Portfolio\ of\ A+B+C} = IAE_{Project\ A} + IAE_{Project\ B} + IAE_{Project\ C} = \frac{Z_A}{Y_A} \times X_A + \frac{Z_B}{Y_B} \times X_B + \frac{Z_C}{Y_C} \times X_C$$

Portfolio of projects – impermissible aggregated approach:

In cases where a single policy covers multiple individual projects, calculation of IAE by aggregation of inputs on a portfolio level is not allowed because it may lead to distortions in the IAE values:

$$IAE_{Portfolio\ of\ A+B+C} \neq \frac{Premium_{Portfolio\ of\ A+B+C}}{Total\ value_{Portfolio\ of\ A+B+C}} \times Emissions_{Portfolio\ of\ A+B+C}$$

An example of this can be found illustrated below with a portfolio of 2 projects. Using the individual project method, the total portfolio IAE is calculated as the sum of individual projects IAEs giving us portfolio IAE of 36. However, when using the aggregated portfolio method, the IAE of the portfolio is calculated as 100 / 200 x 120 = 60. This results in a higher estimated IAE compared to what it should be.

Project	Construction emissions of project	Total value of project	Premium of project (re)insurance	Project IAE
Project A	100	100	20	20 = 20 / 100 x 100
Project B	20	100	80	16 = 80 / 100 x 100
Portfolio total	120	200	100	20 + 16

Example 2: Annual policies

When the re/insurance policy is an annual policy covering a client for a year of operations, the IAE calculation method is the same as the one used for other commercial lines.

Policy	Emissions of client	Revenue of client	Premium of project (re)insurance
Policy A	X_A	Y_A	Z_A

The IAE of the Policy A is calculated as:

$$IAE_{Policy\ A} = \frac{Premium}{Revenue_{Insured,Year}} \times Emissions_{Insured,\ Year} = \frac{Z_A}{Y_A} \times X_A$$

Example 3: Steering a portfolio (Annual policies)

Below is an example of how a re/insurer could compare projects with differing carbon emissions. This is illustrated using 3 different clients in the construction industry with different emissions intensities of their operations. The ratio of annual premium to revenue is kept constant assuming all risk factors except the carbon emissions and size of the client are kept constant.

Client	Scope 1 and 2 emissions (tCO_2)	Revenue (mil $)	Emissions intensity (tCO_2/mil $)	Total annual policy premium ($)
Client A	81,000	6,750	12	20,250,000
Client B	1,900,000	42,222	45	12,666,667
Client C	2,100,000	70,000	30	21,000,000

Given the above clients, a re/insurer could decide to take any combination of shares of the annual policies. Below are two example portfolios. By taking a higher share of one client, and correspondingly taking a lower share of another client, the re/insurer can calculate and steer the portfolio.

	Portfolio 1			Portfolio 2		
Client	**(Re)insurer share (%)**	**(Re)insurer premium ($)**	**IAE (tCO_2)**	**(Re)insurer share (%)**	**(Re)insurer premium ($)**	**IAE (tCO_2)**
Client A	4.94%	1,000,000	12	1.24%	250,000	3

Client B	1.97%	250,000	11.3	7.90%	1,000,000	45
Client C	3.57%	750,000	22.5	3.57%	750,000	22.5
Total		**2,000,000**	**45.8**		**2,000,000**	**70.5**

A similar method can be used for project specific contracts, the only difference being the intensity of the client will be calculated using the estimated emissions of the project instead of the emissions of the client.

AGGREGATION APPROACH

Given the in-scope lines of business for the project insurance methodology, insurers are likely to write more than one line of business or participate on several layers of an insured's re/insurance program. Therefore, to obtain an overall customer view of the construction stage attributed emissions, the premiums from each contract can be easily aggregated, as outlined in Box 2.21.

Box 2.21. Example for calculating the customers attribution factor in a situation where one re/insurer writes more than one line of business with the same insured

Customers with multiple project-specific policies

The aggregation of project specific policies shall be calculated by totalling the insurance-associated emissions of all the individually calculated projects and/or policies. Similarly, the emissions intensity shall be calculated by totalling the individual insurance-associated emissions and dividing by the total of the individual premiums.

For more details on the aggregation approach for project-specific policies, please refer to example 1 in the examples section.

Customers with multiple annual policies[11]

Line of business	Re/insurance premium	Revenue	Insurance-associated emissions attribution factor
CAR	50		0.005
IDI	100		0.01
Total	150	10,000	0.015

$$Customer\ attribution\ factor = \frac{Premium_1 + Premium_2 + \cdots Premium_n}{Revenue}$$

[11] The figures presented in this example are not representative of an actual attribution factor. The factor can be much smaller as a proportion of revenue.

Options to calculate insurance-associated emissions

DATA REQUIRED

Overall, PCAF distinguishes, in line with the financed emissions from general purpose asset classes, three different calculation options based on the emissions data used:

- **Option 1: reported emissions**, where verified[12] or unverified[13] emissions are collected by the reporting re/insurer from the insured company directly (e.g., company sustainability report or Environmental Impact Assessment) or indirectly via verified third-party data providers (e.g., CDP). These emissions are then allocated to the reporting re/insurer using the attribution factor. This follows the existing approach for commercial lines of business.
- **Option 2: physical activity-based emissions**, where emissions are estimated by the reporting re/insurer based on primary physical activity data collected from the insured company (e.g., gross internal floor area or kilometres of road constructed)[14]. These emissions are then allocated to the reporting re/insurer using the attribution factor. The emissions data should be estimated using an appropriate calculation methodology or tool with verified emission factors expressed per physical activity (e.g., tCO_2e/m^2 or tCO_2e/km constructed) issued or approved by a credible independent body. PCAF recognizes that there are few such sources for project specific emission factors at this time, and the applicability of this option to project calculation is limited.
- **Option 3: economic activity-based emissions**, where emissions are estimated by the reporting re/insurer based on economic activity data collected from the insured company (e.g., euro of revenues, euro of assets or project or insured value). These emissions are then allocated to the reporting re/insurer using the attribution factor. The emissions data should be estimated using official statistical data or acknowledged environmentally extended input-output (EEIO) tables providing region- or sector-specific average emission factors expressed per economic activity[15] (e.g., tCO_2 e/€ of revenue or tCO_2 e/€ of asset). PCAF recognizes that there are few such sources for project specific emission factors at this time, and the applicability of this option to project calculation is limited.

DATA QUALITY SCORING

General description of the data quality score table for project insurance

Table 2.21. Construction emissions: project policies (CAR / EAR and IDI)

Data Quality Score 1	Options to estimate insurance-associated emissions		When to use each option (what data should be available)		
			Attribution factor	Emissions tCO2e	
				Scope 1	*Scope 2*
Score 1	Option 1: Reported emissions	1a	(Re)Insurance premium / Project Value	Reported – Verified	Reported Market Based - Verified
Score 2		1b		Reported – Unverified	Reported Market Based - Unverified Reported Location Based - Unverified Reported Location Based - Verified

[12] This refers to reported emissions being calculated in line with the GHG Protocol and verified by a third-party auditor.
[13] This refers to reported emissions being calculated in line with the GHG Protocol without verification by a third-party auditor.
[14] More information can be found at: Construction CO2e Measurement Protocol
[15] Sampling tests based on actual data on the company level extrapolated to the portfolio level can help to test the accuracy of calculations based on this data from statistics or EEIO tables. This may also be used to refine the data for specific sectors or regions if the reporting financial institution has a strong presence in and specific knowledge of the respective sector or region. National agencies and regional data providers or statistical offices in individual regions may assist reporting re/insurers in various regions in finding regional and more relevant financial or emissions data information.

	Option 2: Reported or physical activity-based emissions	2a		Energy Consumption x Emissions Factor (Intensity per MWh of Electricity)
Score 3		2b		Declared quantities x Emissions Factor (Average Sector Emission Intensity per unit of quantity) Examples of quantities include but are not limited to materials implemented (e.g., concrete, timber), energy consumed, and floor area being built.
Score 4	Option 3: Economic activity-based emissions	3a		Project Value x Client average emissions intensity
Score 5		3b		Project Value x Sector/Industry average Emissions Factor (Average Project Emission Intensity per monetary unit)

Table 2.23. Construction emissions: annual premium policies (CAR / EAR and IDI)

Data Quality Score 1	Options to estimate insurance-associated emissions		When to use each option (what data should be available)		
			Attribution factor	Emissions tCO2e	
				Scope 1	*Scope 2*
Score 1	Option 1: Reported emissions	1a	(Re)Insurance premium / Customer Revenue	Reported – Verified	Reported Market Based - Verified
Score 2		1b		Reported – Unverified	Reported Market Based - Unverified Reported Location Based - Unverified Reported Location Based - Verified
	Option 2: Reported or physical activity-based emissions	2a		Energy Consumption x EF (Intensity per MWh of Electricity)	
Score 3		2b		Declared quantities x Emissions Factor (Average Sector Emission Intensity per unit of quantity) Examples of quantities include but are not limited to materials implemented (e.g., concrete, timber), energy consumed, and floor area being built.	
Score 4	Option 3: Economic activity-based emissions	3a	(Re)Insurance Premium / Customer Revenue not aligned with insured entities	Reported Emissions data not aligned with insured entities	
				Energy Consumption or Production Output Data not aligned with insured entities X EF	
Score 5		3b	(Re)Insurance premium / Average Sector Revenue	Average Sector Revenue x EF (Average Sector Emission Intensity per revenue)	

REPORTED EMISSIONS (OPTION 1)

Where available, PCAF recommends Option 1, using emissions data reported by companies in official filings and environmental reports. The most recently available data should be used with mention of the data source, reporting period or publication date. PCAF acknowledges that project insurance includes listed and non-listed companies, and that availability of reported data can be limited, especially for non-listed clients. PCAF also recognizes that emissions data may not be publicly reported at individual project level as requested within the construction emissions: project policies table above.

For project specific emissions information additional reporting sources can be considered, such as Environmental Impact Assessments, which are required by multilateral banks for larger infrastructure projects.

DATA PROVIDERS (OPTION 1)

Emission accounting under this methodology will require data on:

- *Emissions associated with the construction activities*
- *Annual emissions of the insured contractor*

Generally, there is a lack of publicly available or free-to-use data sources for construction projects.

Where available for Option 1, PCAF recommends either collecting emissions from the customer directly (e.g., company sustainability report or Environmental Impact Assessments) or using third-party data providers, including but not limited to CDP, Bloomberg, MSCI, Sustainalytics, S&P/Trucost, and ISS ESG. Data providers typically make scope 1 and 2 emissions data available for larger commercial companies.

Currently information available from data providers does not cover individual project emissions as required under the project methodology. Until there is sufficient market demand and providers start to develop data products which capture project emissions, insurers will need to rely on public information captured directly from the client or published as part of financing frameworks such as the IFC, EBRD & the Equator Principles. Third-party data providers collect emissions data as reported by the companies themselves, either through a standardized framework such as CDP or through a company's own disclosures in official filings and environmental reports. They often have their own methodologies to estimate/ calculate companies' emissions, especially if this data is not reported or does not reflect 100% of the emissions boundaries. In cases where data providers estimate emissions themselves, the calculation would be in line with Options 2 or 3, conditional to the methodology used being in line with the GHG Protocol. Re/insurers should request data providers to be transparent, disclose the calculation method they use, and confirm alignment with the GHG Protocol. This will enable re/ insurers to apply the appropriate data quality score to the estimate. PCAF also encourages data providers to apply the PCAF data quality scoring method to their own data, which would allow them to share the data quality scores directly with their clients.

PCAF recommends using data providers that use the standardized CDP framework for annual emissions. PCAF has observed inconsistencies across data providers for company reported scope 1 and 2 emissions. For re/insurers using data providers, PCAF therefore encourages using the same provider for all insured clients, where possible, and using the most recently available data. PCAF also encourages re/insurers to mention the data source, reporting period or publication date of data. A list of questions to provide guidance when engaging with data providers around methodology and calculation methods is available in 'Annex 1' of Part C.

ESTIMATION MODELS (OPTION 2 AND 3)

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

If no data is available, estimation models consistent with the emissions from the primary business activity may be used for annual premium policies, or models relating to the relevant construction project type. Emission factors from production-based models (i.e., emission intensity per physical activity) are preferred over those from revenue-based models (i.e., emission intensity per revenue) because they are less sensitive to exchange rate or commodity price fluctuations. Emission factors from production-based models in line with Option 2 are especially useful for GHG-intensive industries like utilities, materials, energy and

industrials. Emission factors from revenue-based models in line with Option 3 (e.g., intensity-based or environmental input-output models) have the advantage of requiring less detailed data from the re/insurer.

For Option 2 (physical activity-based emissions), PCAF recommends using actual energy consumption (e.g., megawatt-hours of natural gas consumed) or production (e.g., tons of steel produced) data reported by companies, given that the data fully covers the company's emissions-generating activities. The emission factors expressed per physical activity used should be based on appropriate and verified calculation methodologies or tools issued or approved by a credible independent institution. Example data sources for retrieving emission factors include but are not limited to ecoinvent,[16] Defra,[17] the Intergovernmental Panel on Climate Change (IPCC),[18] GEMIS (Global Emissions Model for integrated Systems),[19] and the Food and Agriculture Organization of the United Nations (FAO).[20] Again, the most recently available data should be used, including a mention of the data source, reporting period or publication date.

For Option 3 (economic activity-based emissions), PCAF recommends using official statistical data or acknowledged EEIO tables providing region- or sector-specific average emission factors expressed per economic activity (e.g., tCO2 e/€ of revenue or tCO2 e/€ of asset). Re/insurers should use emission factors as consistently as possible with the primary business activity, in so far as this is known,[21] but in a way that remains feasible given the large size of project insurance portfolios which cover multiple (granular) business activities. For example, for an insurance policy to a company primarily engaged in the construction of roads, the re/insurer should seek to find and use a specific average emission factor for road projects, not a general emission factor for the construction sector overall, if this level of granularity is available.

Examples of EEIO databases which can be used to obtain industry sector factors are EXIOBASE,[22] the Global Trade Analysis Project (GTAP),[23] or the World Input-Output Database (WIOD).[24] Sector-specific emission factors can also be replaced with values from linear regression models from databases containing company revenue and emissions, by sector and geographical region. This can help re/insurers get started with estimating the insurance-associated emissions of their project insurance portfolios. PCAF expects that the insurance-associated emissions for most project insurance portfolios can be derived through either reported emissions (Option 1), physical activity data (Option 2), or economic activity data (Option 3). However, it allows the use of alternative options to calculate emissions if none of the three can be used or in the case that new options are developed. The reporting re/insurer shall always explain the reasons for using an alternative option if it deviates from the three options defined above.

DATA GRANULARITY

PCAF recognizes that it can be more challenging to source project-level, asset-level or subsidiary level data compared to parent-company-level data. For project lines of business insuring individual projects, which are an asset-specific line of business, asset-based data granularity shall be used for any accounting and reporting under this version of the Standard. For annual premium policies entity level shall be used. Emission and revenue data shall always by on the same level (i.e., company, subsidiary or project level).

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[16] More information can be found at: https://www.ecoinvent.org
[17] More information can be found at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022
[18] More information can be found at: https://www.ipcc-nggip.iges.or.jp/EFDB/find_ef.php
[19] More information can be found at: https://iinas.org/en/
[20] More information can be found at: http://www.fao.org/partnerships/leap/database/ghg-crops/en
[21] For business written through a managing general agent, exact splits of sectoral information may not be available. In cases where the sectoral split is not available, re/insurers could resort to proxies such as market averages
[22] More information can be found at: https://www.exiobase.eu
[23] More information can be found at: https://www.gtap.agecon.purdue.edu/
[24] More information can be found at: http://www.wiod.org

PCAF acknowledges that using data at an entity level (parent or subsidiary) to measure the insurance-associated emissions of specific insured activities, locations, or projects may lead to a less accurate or specific measurement of emissions. To reflect this, when using parent-company-level data or data related to a higher entity relative to the insured project, asset or subsidiary, the resulting insurance-associated emissions will be assigned a lower quality score. An example of this is using parent company-reported verified emissions data and revenue to estimate emissions associated with an insured project or asset: this will be awarded score 4 instead of score 1. Similarly, if company verified emissions and production output is known and used to estimate the emissions associated with the insured asset or project, this will be awarded score 4 instead of score 3.

DATA QUALITY SCORING

PCAF distinguishes three options with six sub-options to calculate the insurance-associated emissions from project insurance policies depending on the data used. If a re/insurer uses a mix of options to calculate the emissions of an insured entity (e.g., actual verified emission is known and only an average revenue/proxy is used to calculate attribution factor, which means that Option 1a and Option 3b are mixed), the data score for the lower-rated option should be assumed for this insured (i.e., score 5 from Option 3b). As scope 1 and 2 emissions will be reported combined, data quality scoring will be applied to both scopes jointly. Data quality scoring will be applied separately to scope 3 emissions data if reported. Since scope 1 and 2 emissions can have different methods of estimation, the combined data quality score to be reported shall be the lowest of the two methods.

Limitations

DATA QUALITY

PCAF recognizes that high-quality data can be difficult to obtain when calculating insurance-associated emissions, particularly for certain insureds, line of business, or insured activities. However, data limitations should not deter re/insurers from taking the first steps toward preparing their inventories. Even estimated or proxy data can help identify GHG-intensive hotspots in their portfolios, which in turn can help to determine their climate strategies. Where data quality is low, re/insurers can develop approaches to improve it over time.

LIFETIME EMISSIONS

PCAF acknowledges that, to date, there are significant limitations around the provision of data. In particular, the comparability, coverage, transparency, and reliability of lifetime emissions data varies greatly per sector and data source. Furthermore, data will be collected by a mixture of sources that vary per re/insurer. The basis of collating, processing, and publishing these figures will also vary by re/insurer, and methodologies must be developed in a way that best suits the internal capabilities of each re/insurer.

Re/insurers may report on lifetime emissions however PCAF also recognizes that each re/insurer needs to independently determine where they consider it to be appropriate to calculate lifetime emissions, within insurance-associated emissions in accordance with guiding principles, applicable legislation, and reporting standards. PCAF also recognizes that re/insurers have different compositions of customers and lines of business within their underwriting portfolios and that they may provide coverage across the value chain. Therefore, by recommending the inclusion of customers' lifetime emissions at this time, PCAF may inadvertently intensify the issue of double-counting emissions. Equally mono-line insurers are unlikely to be in a position to influence a reduction directly or indirectly in customers' scope 3 emissions.

PCAF recognizes that the task of reporting all customers' emissions represents a long-term challenge that is reliant on increasing customer engagement and disclosure. This task is intended to support the development by each individual re/insurer of a set of meaningful and appropriate strategies that will support the measurement of insurance-associated over time. Such measurements and reductions should in turn reflect the best-quality data available. The expectation is that with improved data capture and comparability, the measurements too will improve over time.

PCAF supports efforts by re/insurers to improve the levels of data capture and integrity of customers' emissions over time, with the objective of increasing the level of consistency, quality, and comparability throughout the industry. In alignment with the GHG Protocol, PCAF does not set a threshold above which lifetime emissions should be included. Instead, reporting companies should develop and disclose their own significance lifetime threshold based on their business goals.

EXPOSURE TO MARKET VOLATILITY

Both re/insurance premiums and revenues are exposed to volatility due to insurance market cycles and general macroeconomic market movements, which can be decoupled from changes in real-world GHG emissions. For example, a surge in energy prices would lead to lower insurance-associated emissions, and an increase in loss activity factored into re/insurance premiums over time could lead to increased insurance-associated emissions, even if neither the insured's emissions nor the provided insurance cover has changed. This could lead to counterintuitive developments of insurance-associated emissions, requiring extra efforts for a re/insurer to understand and appropriately explain those dynamics in their reporting.

MEASUREMENT INCONSISTENCIES

Inconsistencies can arise from measuring part of the portfolio with customer-specific emissions data (which may encompass scopes 1, 2, and 3) and from measuring another part with region or sector-specific average emissions data (which often encompasses only scope 1 and 2 emissions). One mitigating factor is that using customer-specific emission data could improve the accuracy of the region or sector-specific average data, provided that the re/insurer has enough client-specific data points relative to the size of the portfolio in a given sector. For example, if a majority of the clients in an insurer's CAR portfolio provide specific emissions data, these averages could be applied (instead of industry-wide sector averages) to the other clients in the sector that do not provide specific emissions data.

3. Glossary

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Project insurance glossary		
Re/Insurance premium		Total insurance premium written for the contract by the Insurer for its share
Total value		Total insured value of project(s) insured
Revenue		Construction Annual Revenue / Expenditure of Project Contractors / Principal Total revenue of the insured contractor or construction expense of the insured principal for the year of the contract
Estimated revenue		Projected operational revenue of insured project(s) Estimated total revenue of the project(s) over their entire lifetime
Emissions	Project Construction / Portfolio construction	Emissions of individual project(s) / portfolio(s) of projects over their entire construction stage
	Insured year	Total emissions of the insured client for the year of the contract
	Project / Portfolio, operating and dismantling	Emissions of individual project(s) / portfolio(s) of projects over their entire Operating and Dismantling stages
	Project, Operating contract period	Estimated operating emissions of the project(s) over the contract period
	Project, Lifetime	Estimated operating emissions of the project(s) over the operating period

4. Technical Appendix

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4.1 Project Insurance

Emissions considerations

Emissions type	Pros	Cons
Lifetime emissions	• More appropriately reflects emissions for projects that emit less carbon over their entire lifetime e.g., renewable energy power plants. • Could potentially be estimated using a proxy on project value, type, material used, average lifespan. • Aligned with existing project finance PCAF methodology if insurance is considered equivalent to a project sponsor or initial lender	• Unlikely to be readily available from clients/3rd party data providers. • Harder to estimate lifetime emissions (useful life may change, non-energy infrastructure like highways or bridges would be difficult to estimate) • Less comparable with other lines of business, would require reporting the figure separately. • High chance of overlap in emissions with Property line of business • Leads to more complexities when calculating emissions for treaty portfolios that include construction contracts. • Might not be aligned with the insurance period and the insured activities e.g., insurers receive premium only for the construction stage, not the lifetime of the construction
Construction stage	• Emissions may be available from clients. • More comparable with other lines of business, if using annual emissions • Less overlap with property line of business • Depending on policy type aligned with insured risk and policy period. • Could potentially be estimated using a proxy on project value, type, material used. • Could potentially be incentivizing as well if IAE from "transition" related projects are disclosed alongside total IAE. • Aligned with existing project finance PCAF methodology if insurance is not considered equivalent to a project sponsor or initial lender	• Can provide a misleading footprint for projects which may emit more carbon during construction but less over their entire lifetime e.g., hydro dam. • Difficult to find a source for construction emissions if clients are unwilling to share additional data. •
Embodied emissions	• Emissions may be available from clients. • More comparable with other lines of business, if using annual emissions • Less overlap with property line of business • Could potentially be estimated using a proxy on project value, type, material used. • Could potentially be incentivizing as well if IAE from "transition" related projects are disclosed alongside total IAE. • May be more representative of the bulk of the emissions associated with construction projects	• Can provide a misleading footprint for projects which may emit more carbon during construction but less over their entire lifetime e.g., hydro dam. • No consistent methodology to capture this type of emission. • Likely only available for a few large projects • Will require large amounts of additional information from customers. • Scope of embodied carbon may differ between different data providers e.g., "cradle-to-gate" vs "up-front carbon." • Difficult to find a proxy for embodied emissions if clients are unwilling to share additional data. • Proxies for embodied carbon are available but most require detailed information about materials used that are generally not provided to re/insurers

OTHER FORMULAS CONSIDERED:

Contract type	
1. Project policies for CAR / EAR and (3.) project-specific IDI. Also valid for portfolios of projects, by adding together several IAEs.	2. Annual policies for CAR / EAR and (3.) Annual basis IDI based on insured turnover.
Option B: Taking into consideration construction + use stage emissions	
$IAE = \frac{Premium}{Total\ Value} \times (Emissions_{Project,Construction+Use})$	Not realistic / feasible for annual covers
Option C: Taking into consideration construction stage + use stage + end-of-life stage emissions	
Not aligned with project finance methodology and GHG protocol as end-of-life is lifecycle, not lifetime	Not realistic / feasible for annual covers

Where:
Gross written insurance premium written for the contract by the insurer for its share
Total insured value of project/s
Total revenue of the insured contractor or construction expense of the insured principal for the year of the contract
Total emissions of the insured client for the year of the contract
Emissions of project portfolio over its entire construction stage
Emissions of project portfolio over its entire construction, and use stages
Emissions of project portfolio over its entire construction, use, and end-of-life stages

Data considerations

There was found to be a lack of publicly available or free-to-use data sources for construction projects, with a range of sources and tools considered.

Firstly, annual company emissions were reviewed however whilst standards and data availability are available for larger companies, there is a lack of data for construction projects. Secondly, multilateral banks require the disclosure of annual, on-site, operational emissions albeit only above a given threshold. This is consistent across the IFC, EBRD & the Equator Principles, however the threshold used differs. Additionally, emissions data within underwriting submissions were investigated but not found to be disclosed and rarely available for the projects insured. Another consideration was voluntary emissions disclosure standards, which exist as part of wider sustainability certifications/disclosure standards (i.e. BREEAM), however there is a lack of project-specific reporting requirements by regulators.

The GLOBAL GHG ACCOUNTING & REPORTING Standard

PART C

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