

Emissions Accounting Education 1:
Introduction to the Emissions Baseline and
PCAF Methodology

Overview for Education Sessions

What education sessions will be available and who will be best placed to attend? (1-hour sessions)

We have organised education session to ensure all market participants have a foundation to feed into product interviews – we want to hear from as many market participants as possible and have offered guidance below, summarising the education and who we think may be best placed to attend.

Workstream	Activity	Heads of ...	Technical Analysts	Underwriters	Brokers	Investment Managers
Baseline	Introduction to the Emissions Baseline and PCAF Methodology	<input checked="" type="checkbox"/>				
Baseline	Company Data & Emissions: Name Matching, Enrichment, Estimating Emissions		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Transition	Ad-hoc education sessions possible topics: Scenarios, Portfolio Alignment, Taxonomies	<input checked="" type="checkbox"/>				

Planned

For consideration - due to unexpected levels of engagement we are planning to include separate sessions for the wider-insurance industry

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Session 1: Introduction to the Emissions Baseline and PCAF Methodology

Speakers



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Agenda: Emissions Accounting

1. Introduction to Insurance Associated Emissions, Financed Emissions and the PCAF Standard (20 mins)
2. Details of Moody's methodology assumptions (30 mins)
 - Treatment of different reporting dates and currency conversions
 - Assessment of Data Quality Scores
3. Overview of Moody's PCAF baseline solution and outputs (5 mins)
4. Q&A (5 mins)

Key Learnings

1. Introduction:

- In November 2022, PCAF published Part C of their GHG Accounting and Reporting Standard, covering emissions associated with *insurance contracts*. P&C Commercial and Personal Motor Lines are in Scope
- Covers Scope 1 & 2 emissions of insured and (separately) Scope 3 emissions of insured “where significant and where data allows”
- The key challenge is data: insurers must obtain actual emissions and revenue, proxy missing data, and then join it all together

2. Assumptions:

- Moody’s align premium and revenue figures by applying currency conversion at the portfolio reporting date
- No arbitrary cut-off on historic data is applied, but emissions and revenue dates used are presented in the results for transparency
- Alignment of Moody’s emissions estimation models to the PCAF DQS specification based on expert judgement

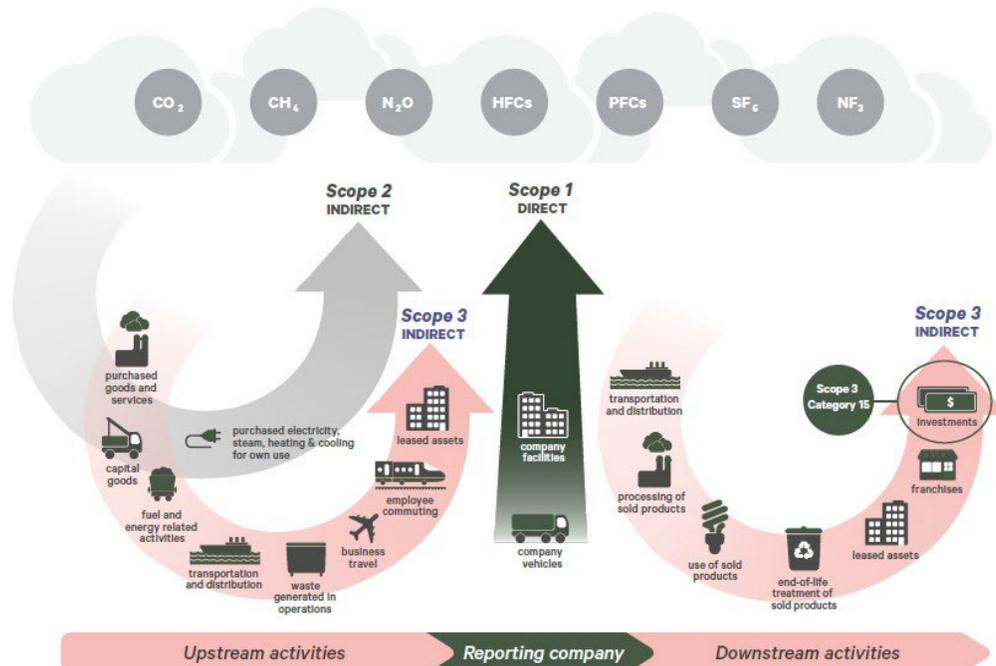
3. Moody’s Solution:

- Moody’s content and capabilities can address the data challenge
- A managed service matches insureds from the underwriting portfolio with entities in our database and joins with revenue and emissions data (actual and proxied). Both policy-level and portfolio-level metrics are returned to the customer
- In future this capability will be self-serve via ExposureIQ

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Introduction to Insurance Associated Emissions and the PCAF Standard

Insurance business and GHG emissions



Source: (WRI and WBCSD, 2011) adapted by PCAF, 2022



Operational emissions

Emissions associated with insurer's own operations e.g. heating, IT, travel



Financed emissions

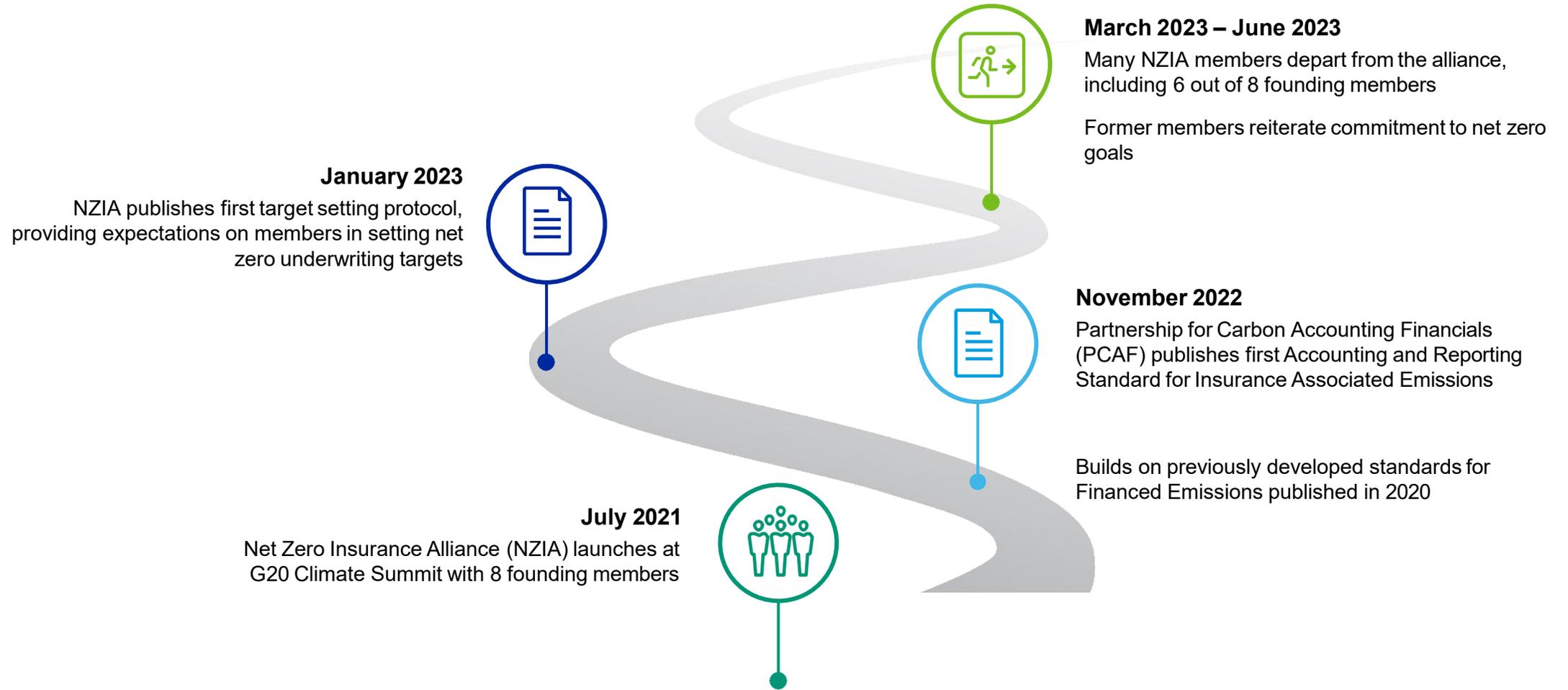
Emissions associated with investments i.e. a portion of emissions of investees that is attributed to the insurer



Insurance Associated Emissions

Emissions associated with underwriting portfolio i.e. a portion of emissions of customers that is attributed to the insurer

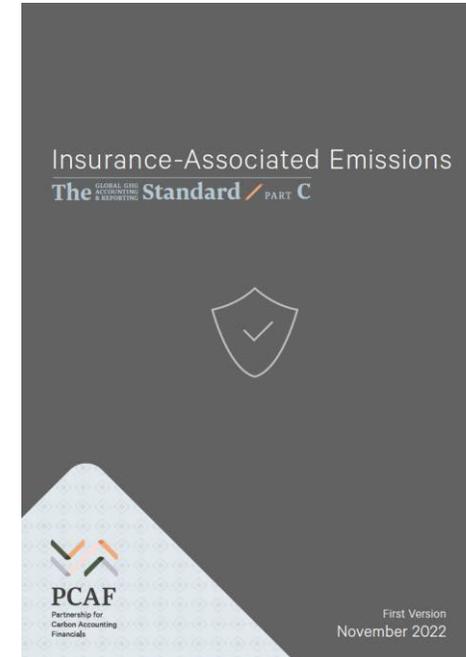
Developments in Insurance Associated Emissions



PCAF Insurance Associated Emissions Standard

In November 2022, PCAF published Part C of their GHG Accounting and Reporting Standard, covering emissions associated with *insurance contracts*

- » Current in scope lines of business
 - **P&C Commercial lines** (directly insured & facultative reinsurance) with some exceptions (e.g. construction all-risks)
 - **P&C Personal motor lines**
- » Current **out of scope** lines of business include
 - Treaty reinsurance
 - Life & health
- » Covers Scope 1 & 2 emissions of insured and (separately) Scope 3 emissions of insured “where significant and where data allows”

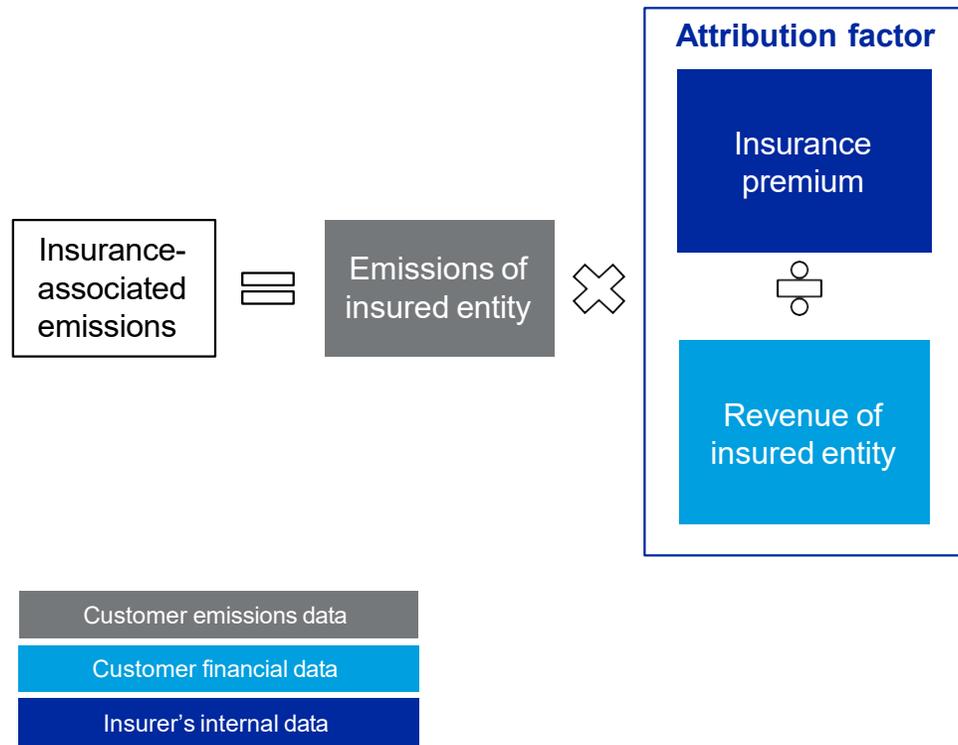


[The Global GHG Accounting and Reporting Standard Part C: Insurance Associated Emissions, First Version, PCAF \(November 2022\)](#)

PCAF Insurance Associated Emissions Standard

Commercial insurance contracts

Insurance Associated Emissions



Data Quality Score

Table 5-3. General description of the data quality score table for commercial lines Insurance (score 1 = highest data quality; score 5 = lowest data quality)

Data quality	Options to estimate Insurance-associated emissions	When to use each option (what data should be available)			
		Attribution factor	Emissions		
			Scope 1	Scope 2	
Score 1	Option 1: Reported Emissions	1a	Reported - Verified	Reported Market Based - Verified	
		1b	Reported - Unverified	Reported Market Based - Unverified Reported Location Based - Unverified Reported Location Based - Verified	
Score 2	Option 2: Reported or physical activity-based emissions	2a	Re/insurance Premium/Customer Revenue		
Score 3			2b	Energy Consumption x EF (Intensity per MWh of Electricity)	
Score 4	Option 3: Economic-activity based emissions	3a	Re/Insurance Premium/Customer Revenue <u>not aligned with insured entities</u>	Reported Emissions/Energy Consumption/ Production Output Data <u>not aligned with insured entities</u>	
Score 5		3b	Re/insurance Premium/Average Sector Revenue	Average Sector Revenue x EF (Average Sector Emission Intensity per Revenue)	

Insurance Associated Emissions and Financed Emissions

PCAF Insurance Associated Emissions (commercial insurance)

$$\text{Attribution factor}_i = \frac{\text{Re/Insurance premium}_i}{\text{Customer revenue}_i}$$

Table 5-3. General description of the data quality score table for commercial lines insurance
(score 1 = highest data quality; score 5 = lowest data quality)

Data quality	Options to estimate insurance-associated emissions	When to use each option (what data should be available)		
		Attribution factor	Emissions	
			Scope 1	Scope 2
Score 1	Option 1: Reported Emissions	1a	Reported - Verified	Reported Market Based - Verified
Score 2		1b	Reported - Unverified	Reported Market Based - Unverified Reported Location Based - Unverified Reported Location Based - Verified
	Score 3	Option 2: Reported or physical activity-based emissions	2a	Energy Consumption x EF (Intensity per MWh of Electricity)
2b			Production Output x EF (Average Sector Emission Intensity per t of Production [output])	
Score 4	Option 3: Economic activity-based emissions	3a	Reported Emissions/Energy Consumption/ Production Output Data <u>not aligned with insured entities</u>	
Score 5		3b	Average Sector Revenue x EF (Average Sector Emission Intensity per Revenue)	

PCAF Financed Emissions (listed equity and corporate bonds)

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

Table 5-3. General description of the data quality score table for listed equity and corporate bonds⁵⁸
(score 1 = highest data quality; score 5 = lowest data quality)

Data Quality	Options to estimate the financed emissions	When to use each option	
Score 1	Option 1: Reported emissions	1a	Outstanding amount in the company and EVIC are known. Verified emissions of the company are available.
		1b	Outstanding amount in the company and EVIC are known. Unverified emissions calculated by the company are available.
Score 2	Option 2: Physical activity-based emissions	2a ⁵⁸	Outstanding amount in the company and EVIC are known. Reported company emissions are not known. Emissions are calculated using primary physical activity data of the company's energy consumption and emission factors ⁵⁸ specific to that primary data. Relevant process emissions are added.
Score 3		2b	Outstanding amount in the company and EVIC are known. Reported company emissions are not known. Emissions are calculated using primary physical activity data of the company's production and emission factors specific to that primary data.
Score 4	Option 3: Economic activity-based emissions	3a	Outstanding amount in the company, EVIC, and the company's revenue ⁵⁸ are known. Emission factors for the sector per unit of revenue are known (e.g., tCO ₂ e per euro or dollar of revenue earned in a sector).
Score 5		3b	Outstanding amount in the company is known. Emission factors for the sector per unit of asset (e.g., tCO ₂ e per euro or dollar of asset in a sector) are known.
		3c	Outstanding amount in the company is known. Emission factors for the sector per unit of revenue (e.g., tCO ₂ e per euro or dollar of revenue earned in a sector) and asset turnover ratios for the sector are known.

The Challenge is Data

Does the data exist?

- » Available reports/disclosures vary significantly by demographic
- » Emissions data is less widely reported than financials

Do insurers have the data?

- » They might have revenue data on their customers
- » They are unlikely to have reported emissions data

Where can they get it from?

- » One or more third party providers can help
- » Aligning data sets is challenging

How do they fill gaps in disclosure?

- » Economic models for emissions
- » Predictive models for emissions
- » Ask the customer!

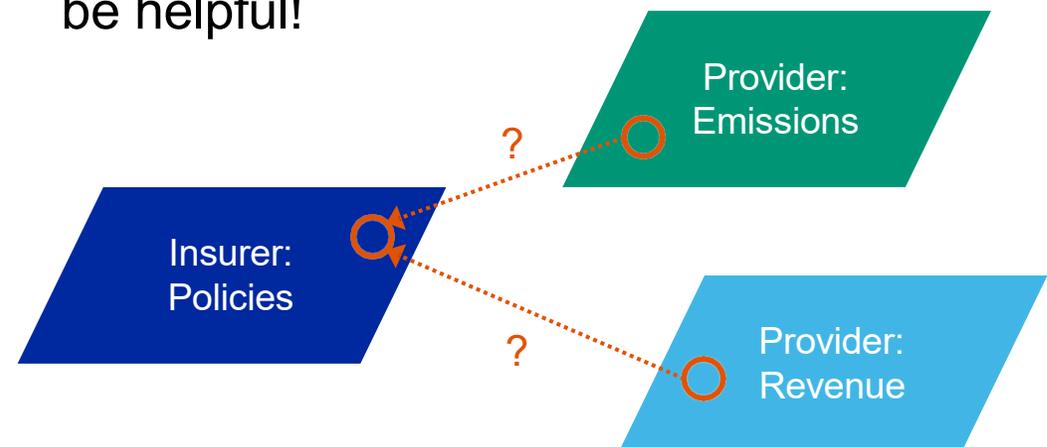
Key Challenges

Emissions Disclosure Gap

- » Often even large companies do not disclose emissions
- » Commercial UW portfolio is largely small companies
- » **Data gap for insurers is more like 90% than 5%**
- » Direct engagement is costly and time consuming
- » Highlights need for estimation and predictive models

Joining It Up

- » Joining Insurers company data with one or more 3rd party providers is challenging
- » No universal company key/identifier
- » Require automated name matching
- » A private company identifier standard would be helpful!



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Moody's Methodology Assumptions

PCAF Accounting and Reporting Standard

Calculations look straightforward *but* assumptions are required

Policy-level IAE (commercial lines)

Policy-level Data Quality Score

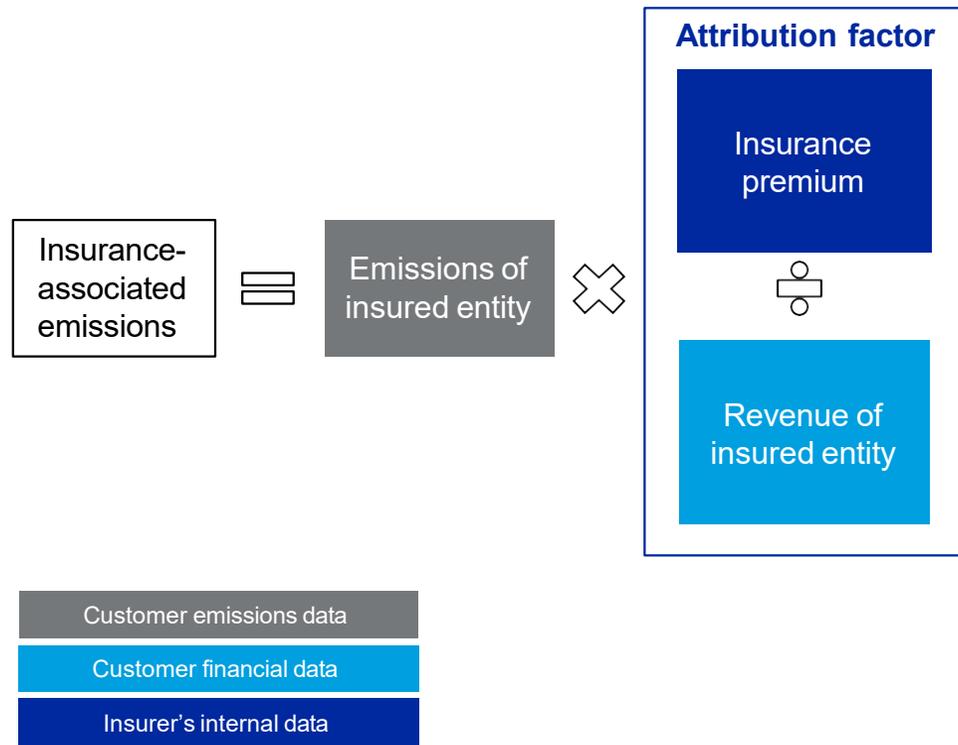


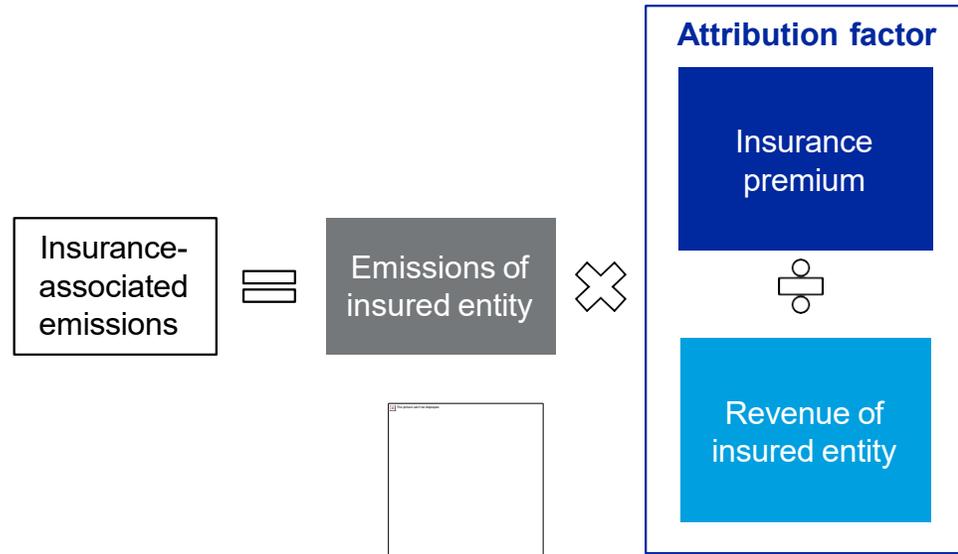
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Data quality	Options to estimate insurance-associated emissions	When to use each option (what data should be available)			
		Attribution factor	Emissions		
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Score 1	Option 1: Reported Emissions	1a	Reported - Verified	Reported Market Based - Verified	
		1b	Reported - Unverified	Reported Market Based - Unverified Reported Location Based - Unverified Reported Location Based - Verified	
Score 2	Option 2: Reported or physical activity-based emissions	2a	Re/insurance Premium/Customer Revenue Energy Consumption x EF (Intensity per MWh of Electricity)		
Score 3		2b	Production Output x EF (Average Sector Emission Intensity per t of Production [output])		
Score 4	Option 3: Economic-activity based emissions	3a	Re/Insurance Premium/Customer Revenue <u>not aligned with insured entities</u> Reported Emissions/Energy Consumption/ Production Output Data <u>not aligned with insured entities</u>		
Score 5		3b	Re/insurance Premium/Average Sector Revenue Average Sector Revenue x EF (Average Sector Emission Intensity per Revenue)		

Policy-level IAE (commercial lines)

Dates and currencies do not always align

1. What is the reporting date?
2. and the reporting currency?



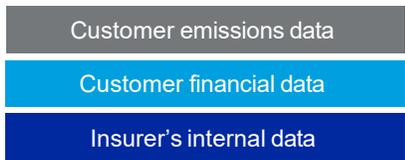
3. In what currency are the premiums stated?

6. What exchange rates do we use to align premium with revenue?

7. Does the emissions date match the revenue date?

4. In what currency is the revenue stated?

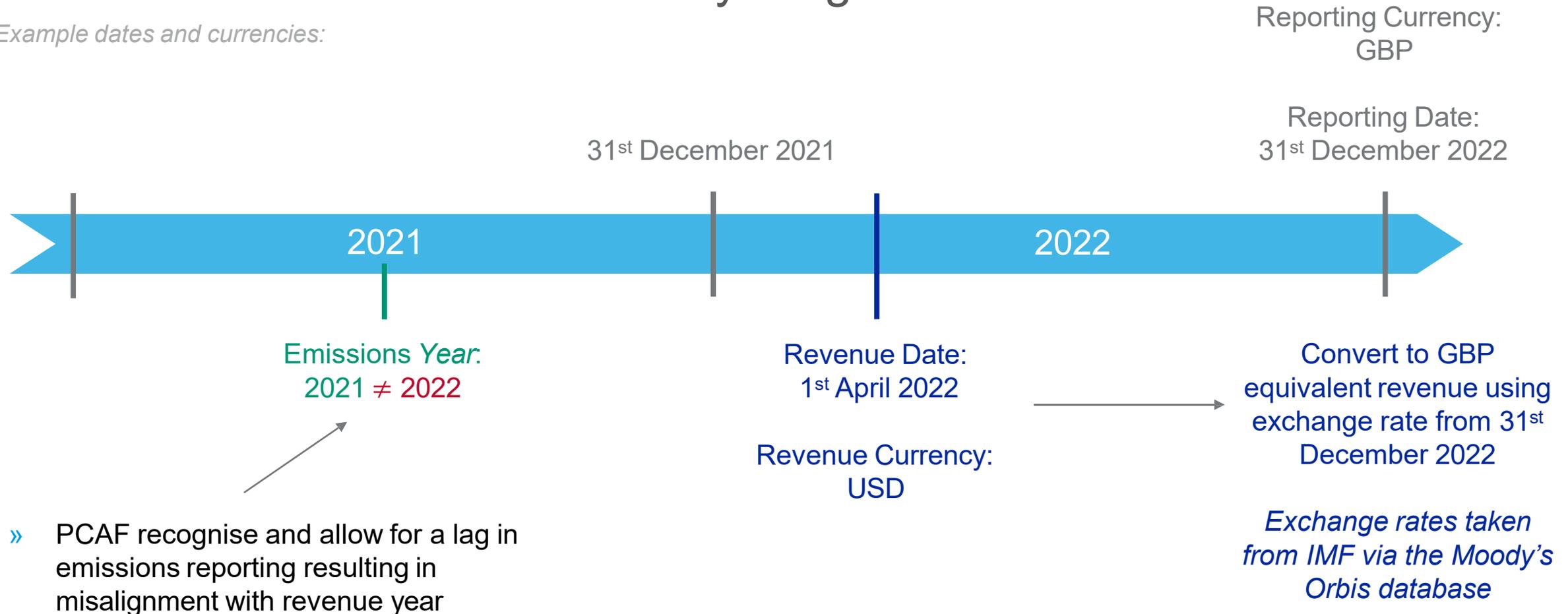
5. On what date was the revenue reported?



Policy-level IAE (commercial lines)

Dates and currencies do not always align

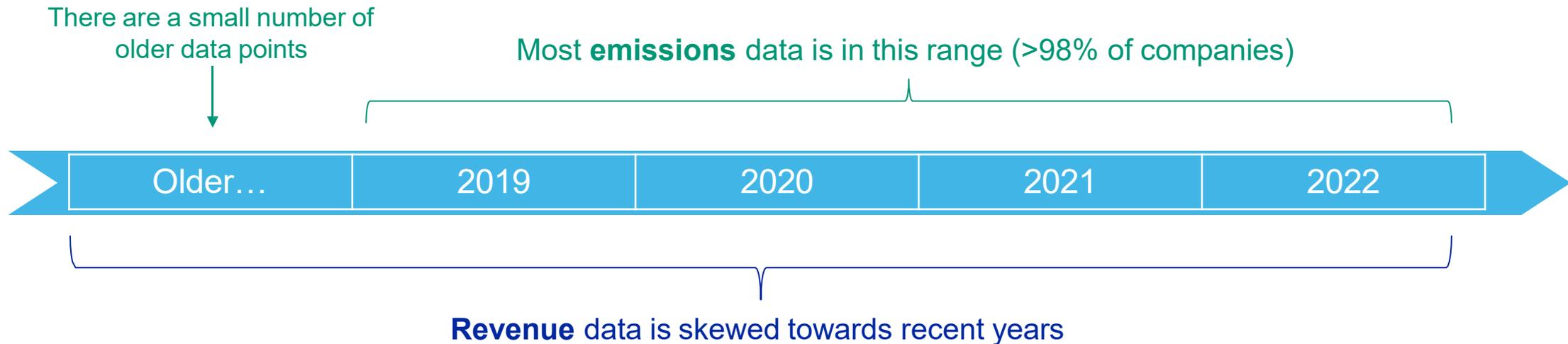
Example dates and currencies:



- » PCAF recognise and allow for a lag in emissions reporting resulting in misalignment with revenue year

Policy-level IAE (commercial lines)

How old is the data?



» Currently, we *do not*:

- Exclude data older than a specific year
- Require alignment between emissions year and revenue year

» We do

- Use the most recent available date for both emissions and revenue (up to the reporting date)
- Present the years associated with revenue and emissions in the results

Policy-level IAE (commercial lines)

Summary of assumptions

Exchange Rates

- » Currencies of premium and revenue must be aligned to calculate attribution factor
- » We use IMF exchange rates as of portfolio reporting date (e.g. 31st December 2022)

Reporting Year

- » We use the most recent available emissions and revenue data (up to the reporting date)
- » We do not filter out data older than an arbitrary year
- » We do not require the emissions year to match the revenue year
- » We present both the emissions and revenue year in the output for transparency and validation

Policy-level Data Quality Score

How do we map our data onto the PCAF (IAE) data quality score?

Table 5-3. General description of the data quality score table for commercial lines insurance
(score 1 = highest data quality; score 5 = lowest data quality)

Data quality	Options to estimate insurance-associated emissions	When to use each option (what data should be available)		
		Attribution factor	Emissions	
			Scope 1	Scope 2
Score 1	Option 1: Reported Emissions	1a	Reported - Verified	Reported Market Based - Verified
Score 2		1b	Reported - Unverified	Reported Market Based - Unverified Reported Location Based - Unverified Reported Location Based - Verified
	Score 3	Option 2: Reported or physical activity-based emissions	2a	Re/insurance Premium/Customer Revenue Energy Consumption x EF (Intensity per MWh of Electricity)
2b			Production Output x EF (Average Sector Emission Intensity per t of Production [output])	
Score 4	Option 3: Economic-activity based emissions	3a	Re/insurance Premium/Customer Revenue <u>not aligned with insured entities</u> Reported Emissions/Energy Consumption/ Production Output Data <u>not aligned with insured entities</u>	
Score 5		3b	Re/insurance Premium/Average Sector Revenue Average Sector Revenue x EF (Average Sector Emission Intensity per Revenue)	

- » DQS specified for Scope 1 and Scope 2 emissions
- » *We make assumptions (later) for scope 3*
- » Many suggested methods for attributing data quality
- » The list is not exhaustive
- » **Assumption: align Moody's methodologies with this specification**

Policy-level Data Quality Score

We can align with our established Financed Emissions methodology

Table 5-3. General description of the data quality score table for commercial lines insurance
(score 1 = highest data quality; score 5 = lowest data quality)

Data quality	Options to estimate insurance-associated emissions	When to use each option (what data should be available)		
		Attribution factor	Emissions	
			Scope 1	Scope 2
Score 1	Option 1: Reported Emissions	1a	Reported - Verified	Reported Market Based - Verified
Score 2			1b	Reported - Unverified
Score 3	Option 2: Reported or physical activity-based emissions	2a	Energy Consumption x EF (Intensity per MWh of Electricity)	
		2b	Production Output x EF (Average Sector Emission Intensity per t of Production [output])	
Score 4	Option 3: Economic activity-based emissions	3a	Reported Emissions/Energy Consumption/ Production Output Data <u>not aligned with insured entities</u>	
Score 5		3b	Average Sector Revenue x EF (Average Sector Emission Intensity per Revenue)	

Unique to IAE

Table 5-3. General description of the data quality score table for listed equity and corporate bonds⁶⁸
(score 1 = highest data quality; score 5 = lowest data quality)

Data Quality	Options to estimate the financed emissions	When to use each option	
Score 1	Option 1: Reported emissions	1a	Outstanding amount in the company and EVIC are known. Verified emissions of the company are available.
		1b	Outstanding amount in the company and EVIC are known. Unverified emissions calculated by the company are available.
Score 2	Option 2: Physical activity-based emissions	2a ⁶⁹	Outstanding amount in the company and EVIC are known. Reported company emissions are not known. Emissions are calculated using primary physical activity data of the company's energy consumption and emission factors ⁷⁰ specific to that primary data. Relevant process emissions are added.
		2b	Outstanding amount in the company and EVIC are known. Reported company emissions are not known. Emissions are calculated using primary physical activity data of the company's production and emission factors specific to that primary data.
Score 4	Option 3: Economic activity-based emissions	3a	Outstanding amount in the company, EVIC, and the company's revenue ⁷¹ are known. Emission factors for the sector per unit of revenue are known (e.g., tCO ₂ e per euro or dollar of revenue earned in a sector).
Score 5		3b	Outstanding amount in the company is known. Emission factors for the sector per unit of asset (e.g., tCO ₂ e per euro or dollar of asset in a sector) are known.
		3c	Outstanding amount in the company is known. Emission factors for the sector per unit of revenue (e.g., tCO ₂ e per euro or dollar of revenue earned in a sector) and asset turnover ratios for the sector are known.

Policy-level Data Quality Score

Alignment of Moody's sources with PCAF specification

Table 5-3. General description of the data quality score table for commercial lines insurance
(score 1 = highest data quality; score 5 = lowest data quality)

Data quality	Options to estimate insurance-associated emissions		When to use each option (what data should be available)		
			Attribution factor	Emissions	
				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		Production Output x EF (Average Sector Emission Intensity per t of Production [output])	
Score 4	Option 3: Economic-activity based emissions	3a	Re/Insurance Premium/Customer Revenue <u>not aligned with insured entities</u>	Reported Emissions/Energy Consumption/ Production Output Data <u>not aligned with insured entities</u>	
Score 5		3b	Re/insurance Premium/Average Sector Revenue	Average Sector Revenue x EF (Average Sector Emission Intensity per Revenue)	

Option	Score	Moody's Emissions Source
1a	1	Scope 1 & 2 reported and independently verified
1b	2	Scope 1 & 2 reported and unverified
2a	2	Scope 1 & 2 not reported and estimated with Forecast/Extrapolation
2b	3	Scope 1 & 2 not reported and estimated with Energy Consumption
		Scope 1 & 2 not reported and estimated with Physical Factors approach (Company Carbon Factor)
3a	4	<i>Not in scope of prototype solution</i>
3b	5	Scope 1&2 not reported and estimated with economic data (revenue, employees, market capitalization) Includes Moody's Machine Learning Model

Policy-level Data Quality Score

Attribution factor (revenue) DQS is unique to IAE

Table 5-3. General description of the data quality score table for commercial lines insurance
(score 1 = highest data quality; score 5 = lowest data quality)

Data quality	Options to estimate insurance-associated emissions	When to use each option (what data should be available)		
		Attribution factor	Emissions	
			Scope 1	Scope 2
Score 1	Option 1: Reported Emissions	1a	Reported - Verified	
Score 2			1b	Reported - Unverified
Score 3	Option 2: Reported or physical activity-based emissions	2a	Energy Consumption	
Score 4			2b	Production Capacity Intensity per Entity
Score 5	Option 3: Economic activity-based emissions	3a	Reported Emissions Production Capacity Intensity per Entity	
Score 5			3b	Average Sector Revenue x EF (Average Sector Emission Intensity per Revenue)

Unlike for FE, there is a DQS specified for revenue/attribution factor in IAE

Table 5-3. General description of the data quality score table for listed equity and corporate bonds⁶⁸
(score 1 = highest data quality; score 5 = lowest data quality)

Data Quality	Options to estimate the financed emissions	When to use each option	
Score 1	Option 1: Reported emissions	1a	Outstanding amount in the company and EVIC are known. Verified emissions of the company are available.
		1b	Outstanding amount in the company and EVIC are known. Unverified emissions calculated by the company are available.
Score 2	Option 2: Physical activity-based emissions	2a ⁶⁹	Outstanding amount in the company and EVIC are known. Reported company emissions are not known. Emissions are calculated using primary physical activity data of the company's energy consumption and emission factors ⁷⁰ specific to that primary data. Relevant process emissions are added.
		2b	Outstanding amount in the company and EVIC are known. Reported company emissions are not known. Emissions are calculated using primary physical activity data of the company's production and emission factors specific to that primary data.
Score 3	Option 3: Economic activity-based emissions	3a	Outstanding amount in the company, EVIC, and the company's revenue ⁷¹ are known. Emission factors for the sector per unit of revenue are known (e.g., tCO ₂ e per euro or dollar of revenue earned in a sector).
Score 4		3b	Outstanding amount in the company is known. Emission factors for the sector per unit of asset (e.g., tCO ₂ e per euro or dollar of asset in a sector) are known.
Score 5		3c	Outstanding amount in the company is known. Emission factors for the sector per unit of revenue (e.g., tCO ₂ e per euro or dollar of revenue earned in a sector) and asset turnover ratios for the sector are known.

Policy-level Data Quality Score

Revenue DQS

Table 5-3. General description of the data quality score table for commercial lines insurance
(score 1 = highest data quality; score 5 = lowest data quality)

Data quality	Options to estimate insurance-associated emissions	When to use each option (what data should be available)		
		Attribution factor	Emissions	
			Scope 1	Scope 2
Score 1	Option 1: Reported Emissions	1a	DQS Revenue = 1	
Score 2		1b		
		2a		
Score 3	Option 2: Reported or physical activity-based emissions	2b	DQS Revenue = 1	
Score 4	Option 3: Economic-activity based emissions	3a		
		3b		
Score 5			DQS Revenue = 5	

- » If revenue is marked as ‘Limited Financials’ in Moody’s Orbis, we assign a revenue DQS of 5
- » Otherwise, we assign revenue DQS of 1
- » (Score 4 is not used)

Limited Financials (LF):

The information available for such companies is often based on rounded figures.

There are several countries where detailed financials are not available for some companies. In such case, LF are quite often made of a median value of turnover range, or turnover estimate.

Policy-level Data Quality Score

Combining Emissions DQS and Revenue DQS

Table 5-3. General description of the data quality score table for commercial lines insurance
(score 1 = highest data quality; score 5 = lowest data quality)

Data quality	Options to estimate insurance-associated emissions	When to use each option (what data should be available)		
		Attribution factor	Emissions	
			Scope 1	Scope 2
Score 1	Option 1: Reported Emissions	1a	Reported - Verified	Reported Market Based - Verified
Score 2		1b	Reported - Unverified	Reported Market Based - Unverified Reported Location Based - Unverified Reported Location Based - Verified
	Score 3	Option 2: Reported or physical activity-based emissions	2a	Re/insurance Premium/Customer Revenue Energy Consumption x EF (Intensity per MWh of Electricity)
2b			Production Output x EF (Average Sector Emission Intensity per t of Production [output])	
Score 4	Option 3: Economic-activity based emissions	3a	Re/insurance Premium/Customer Revenue <u>not aligned with insured entities</u> Reported Emissions/Energy Consumption/ Production Output Data <u>not aligned with insured entities</u>	
Score 5		3b	Re/insurance Premium/Average Sector Revenue Average Sector Revenue x EF (Average Sector Emission Intensity per Revenue)	

» We define IAE DQS as

'max' means worse!

$$DQS_{IAE} = \max(DQS_{Emissions}, DQS_{Revenue})$$

- » Prudent approach: take care *not to overstate DQS*
- » E.g. IAE DQS = 1 reserved for only when
 - emissions are reported and independently verified; *and*
 - revenue is reported and not estimated

Policy-level Data Quality Score

What about the Scope 3 DQS?

Table 5-3. General description of the data quality score table for commercial lines insurance
(score 1 = highest data quality; score 5 = lowest data quality)

Data quality	Options to estimate insurance-associated emissions	When to use each option (what data should be available)		
		Attribution factor	Emissions	
			Scope 1	Scope 2
Score 1	Option 1: Reported Emissions	1a	Reported - Verified	Reported Market Based - Verified
Score 2		1b	Reported - Unverified	Reported Market Based - Unverified Reported Location Based - Unverified Reported Location Based - Verified
	Score 3	Option 2: Reported or physical activity-based emissions	2a	Re/insurance Premium/Customer Revenue Energy Consumption x EF (Intensity per MWh of Electricity)
2b			Production Output x EF (Average Sector Emission Intensity per t of Production [output])	
Score 4	Option 3: Economic-activity based emissions	3a	Re/insurance Premium/Customer Revenue <u>not aligned with insured entities</u> Reported Emissions/Energy Consumption/ Production Output Data <u>not aligned with insured entities</u>	
Score 5		3b	Re/insurance Premium/Average Sector Revenue Average Sector Revenue x EF (Average Sector Emission Intensity per Revenue)	

- » Scope 3 is recommended but not required by PCAF
- » (Emissions) DQS specification only given for scopes 1 & 2
- » Available data is more limited for Scope 3 emissions

We apply a best-efforts approach to align scope 3 DQS to the PCAF specification for scopes 1 & 2

Policy-level Data Quality Score

What about the Scope 3 DQS?

Table 5-3. General description of the data quality score table for commercial lines insurance
(score 1 = highest data quality; score 5 = lowest data quality)

Data quality	Options to estimate insurance-associated emissions		When to use each option (what data should be available)		
			Attribution factor	Emissions	
				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		Production Output x EF (Average Sector Emission Intensity per t of Production [output])	
Score 4	Option 3: Economic-activity based emissions	3a	Re/Insurance Premium/Customer Revenue <u>not aligned with insured entities</u>	Reported Emissions/Energy Consumption/ Production Output Data <u>not aligned with insured entities</u>	
Score 5		3b	Re/insurance Premium/Average Sector Revenue	Average Sector Revenue x EF (Average Sector Emission Intensity per Revenue)	

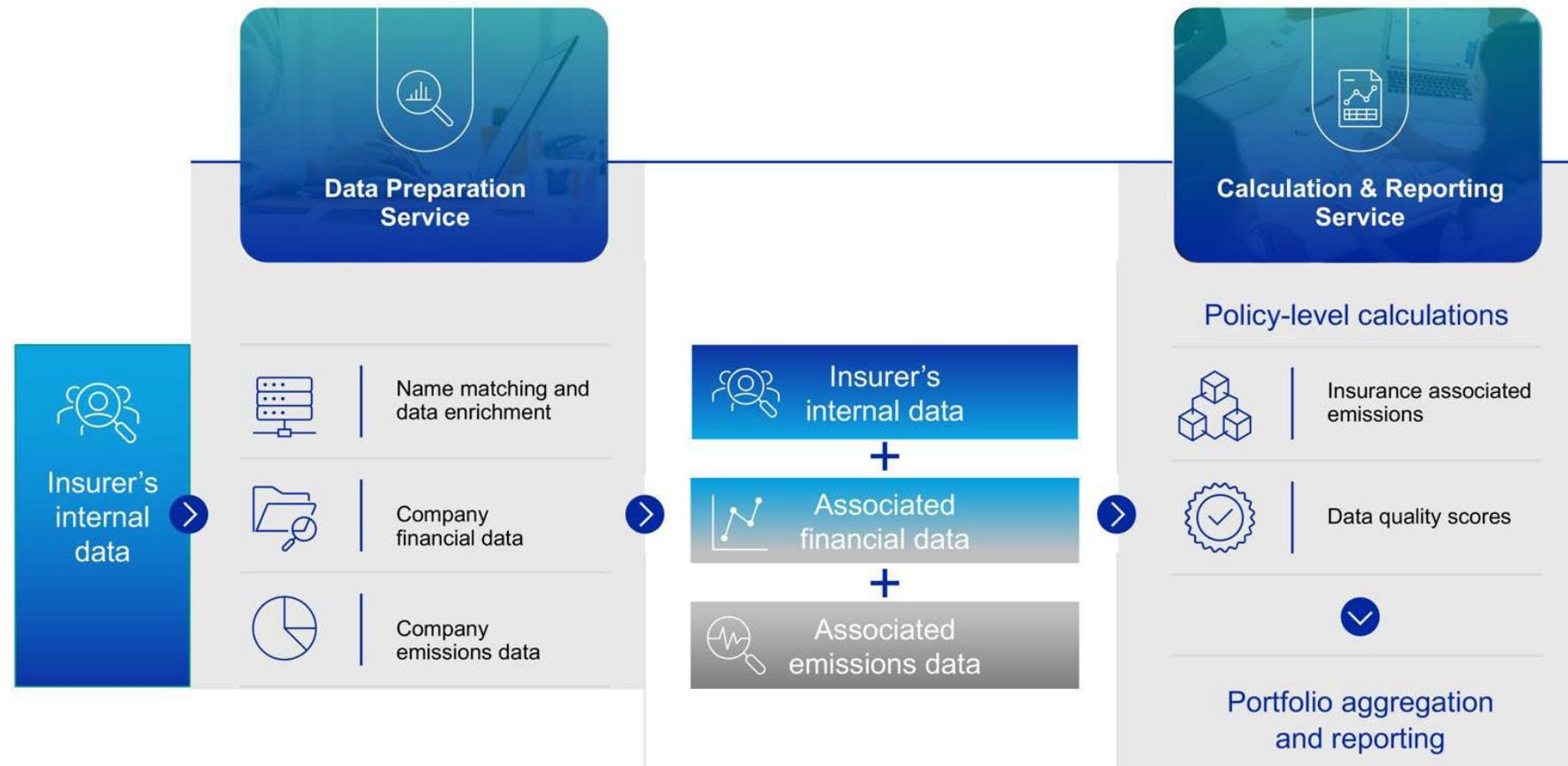
Option	Score	Moody's Emissions Source
1a	1	NONE - We do not have the data required to identify 3 rd party verification
1b	2	Scope 3 reported <i>(It may have been verified, but we don't have the data point, so we prudently assign the worse score)</i>
2a	2	NONE – we do not (currently) differentiate between estimation methods in the data set
2b	3	NONE – we do not (currently) differentiate between estimation methods in the data set
3a	4	<i>Not in scope of prototype solution</i>
3b	5	Scope 3 estimated Includes Moody's Machine Learning Model <i>(We do not currently have the estimation method datapoint, so we prudently assign the worst score)</i>

3

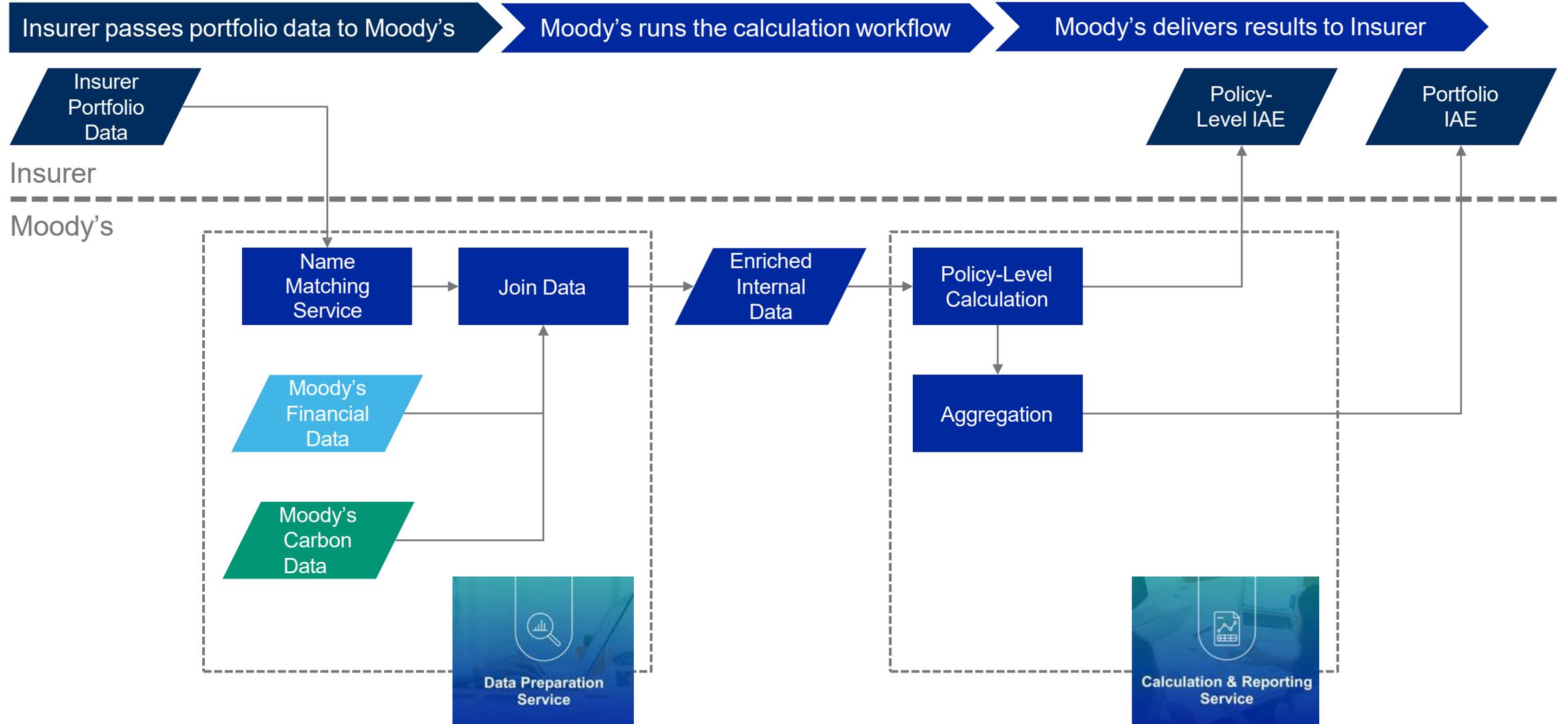
Moody's PCAF Baseline Solution

Moody's Net Zero Underwriting Module (NZUM)

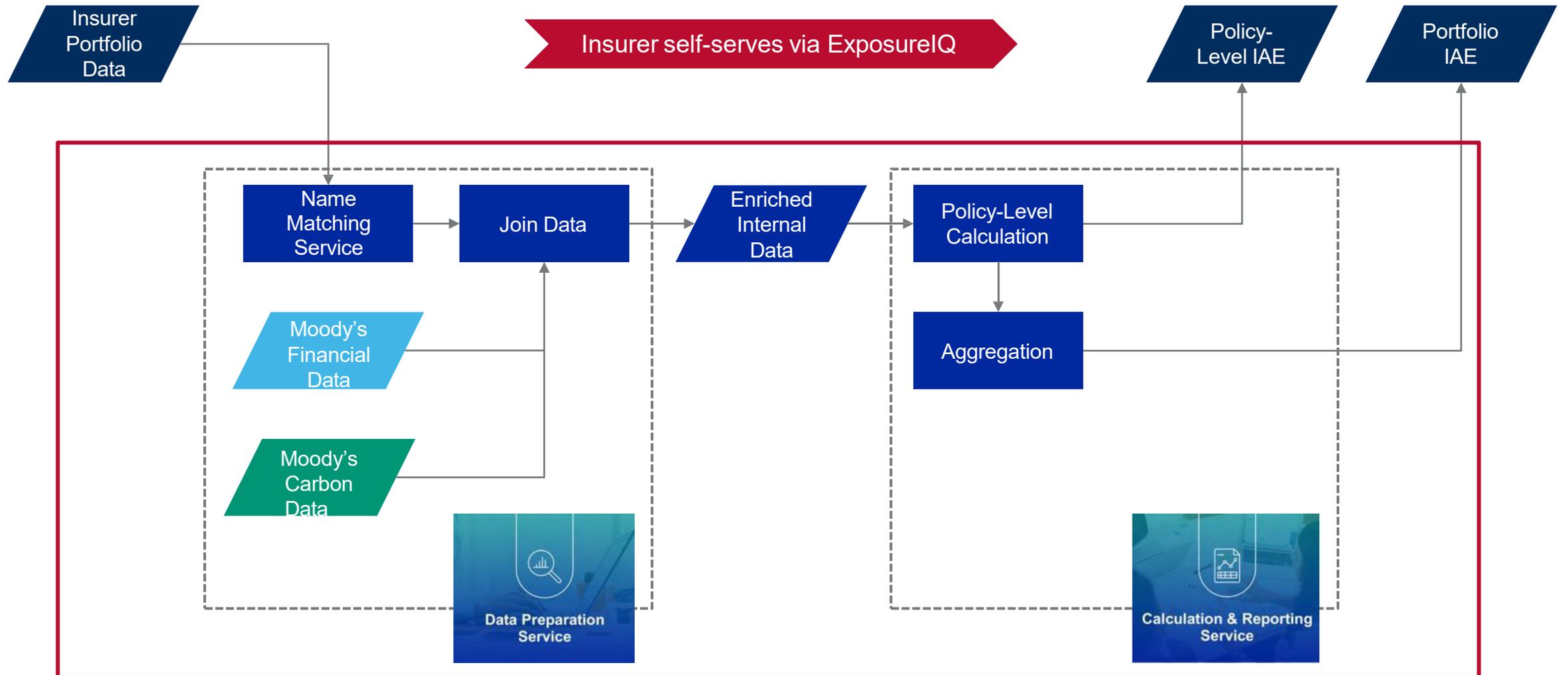
How Moody's are supporting Net Zero Underwriting (commercial lines)



Baseline emissions delivered via a managed service

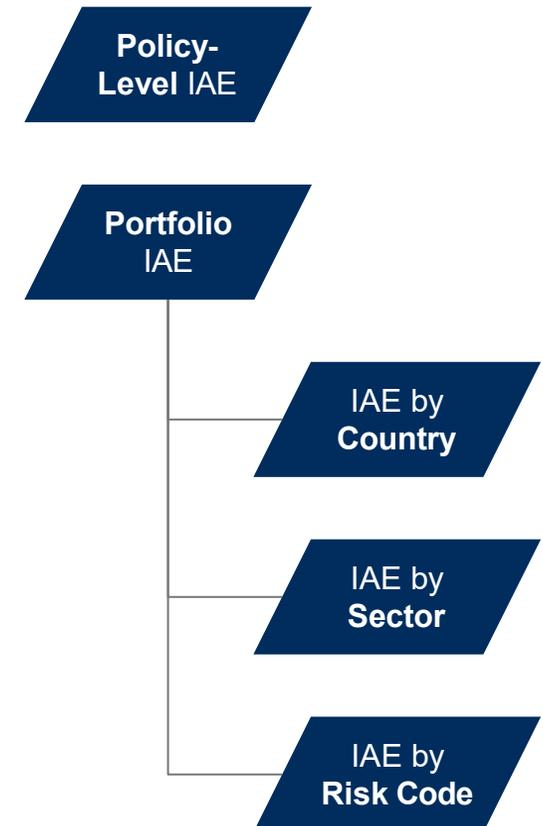


In future: baseline emissions via ExposureIQ



Content produced by managed service

- » Results are delivered via CSV files
- » Measurements of IAE for
 - Scope 1&2 combined
 - Scope 3
- » **Policy-level results** file contains IAE, DQS and other data at a policy-level
 - Entire portfolio represented
 - Includes policies where it was not possible to measure IAE (empty values)
- » **Portfolio results** file give provides summary statistics covering *matched* insureds
 - Individual supplementary files present same statistics by **country** of insured, **sector** of insured, and **risk code***.



*or other insurance line of business classification

4

Summary and Q&A

Summary and Q&A

- » Email us: LloydsLabMoodyPoC@moodys.com
- » Visit us at our office hours
 - 10:00-16:00 on Tuesdays in the Lloyd's Lab
 - *Justin in-person on 14th November*

1

Introduction to PCAF IAE Standard

- In November 2022 PCAF published a standard for measurement of Insurance Associated Emissions. [P&C commercial](#) and personal motor lines are in scope.
- The key [challenge is data](#): obtaining actuals, proxying to fill gaps, and joining it all together.

2

Moody's Methodology Assumptions

- To implement the standard, assumptions must be made about alignment of [dates](#) and [currency conversions](#), as well as about the appropriate [assignment of Data Quality Scores](#).
- Moody's currently use the most recent data available with no historic cut-off.
- Moody's map proprietary analyst models and a machine learning model onto PCAF DQS.

3

Moody's PCAF Solution

- Moody's solution is [delivered via a managed service](#) that covers both data preparation and IAE calculation.
- Will be [self-serve via ExposureIQ](#) in future.
- The solution provides both policy-level and portfolio-level metrics.

A

Appendix

Class of Business: PCAF as a foundation

Table 5-1. Business segments and lines of business covered by this Standard. This list may look different for each re/insurance company.

Segment	LoB	Covered in
Commercial insurance (directly insured and facultative reinsurance covers)	• Property (e.g., fire, multi-peril)	5.2 Emissions associated with commercial lines portfolios
	• Liability/Casualty (e.g., General Liability, Product Liability, Product Recall, Environmental Liability)	5.2 Emissions associated with commercial lines portfolios
	Commercial motor (all lines)	5.2 Emissions associated with commercial lines portfolios
	Marine (liability and hull)	5.2 Emissions associated with commercial lines portfolios
	Aviation (liability and hull)	5.2 Emissions associated with commercial lines portfolios
	Agriculture (excluding government schemes, arrangements)	5.2 Emissions associated with commercial lines portfolios
	Trade credit (insurance of credit risk for sold goods) and political risk – primary insurance only ³⁰	5.2 Emissions associated with commercial lines portfolios
	Structured trade credit (insurance of credit risk for bank loans, mortgages, or other financial instruments)	Out of scope of current version of the Standard ³¹
	Surety	Out of scope of current version of the Standard ³²
	Engineering lines: Construction all-risk, erection all-risk only	Out of scope of current version of the Standard ³³
All other engineering lines (e.g., machinery breakdown and electronic equipment)	5.2 Emissions associated with commercial lines portfolios	

to be continued on next page >

e.g. concerns about D&O in scope – use PCAF calculation as foundation for stress

Segment	LoB	Covered in
Commercial insurance (directly insured and facultative reinsurance covers)	Corporate life and pensions, personal accident	Out of scope of current version of the Standard
	Other/Special lines (e.g., Financial Lines [e.g., Professional Indemnity, D&O], workers compensation)	5.2 Emissions associated with commercial lines portfolios
Statutory lines of business		5.2 Emissions associated with commercial lines portfolios
Public entities	Insurance contracts purchased by public entities (e.g., government agencies, municipalities, etc.)	Out of scope of current version of the Standard
Personal lines	Motor (all lines)	5.3 Emissions associated with personal motor portfolios
	Liability	Out of scope of current version of the Standard
	Property	Out of scope of current version of the Standard
	Other/Special lines (e.g., Travel assistance, legal assistance, pet)	Out of scope of current version of the Standard
Treaty reinsurance (incl. treaty-like facultative reinsurance structures)	Life and Health	Out of scope of current version of the Standard
	All LoBs	Out of scope of current version of the Standard

e.g. construction out of scope – use PCAF calculation as foundation for stress

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