ESG

Financed emissions

Navigating the Data Challenge

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pwc

Executive Summary

Financed emissions baselining is **critical** but hindered by **availability** & **quality** of **data**.

Robust data allows for more effective **risk management** and **greater confidence** in decision making, both vital in net zero alignment and decarbonisation strategies.

Considering their **sustainability reporting requirements** and the robustness of existing financed emissions models, firms should set in place initiatives to improve the **quality** and **consistency** of emissions data underpinning these.

PwC can support you in **improvement of existing models** or starting your **journey towards measurement**.

Measuring financed emissions

- The financial industry has an **important role** in the transitioning towards a low carbon economy and incentivising carbon reduction towards **Net Zero commitments**.
- **Financed emissions**, which are the emissions linked to lending and investment activities, are the **most significant component of financial institutions' carbon footprint**.

Importance of data quality

- The **data source and method** used to measure and estimate are equally important for financed emissions measurement primarily for two reasons:
  - **Sustainability reporting** – To comply with sustainability reporting requirements, such as ISSB and CSRD, as well as disclosing data quality.
  - **Strategic implications** – To determine the most appropriate decarbonisation strategies in line with set targets and alignment to the Transition Plan Taskforce (TPT)
- Furthermore, FIs are increasingly seeking **external assurance** on their emissions disclosures, including on sourced **third party** data. We note that CSRD mandates assurance on key disclosure metrics such as financed emissions.
- Therefore, while **data quality** is always important, sourcing robust data is vital to **decision making** and **decarbonisation strategies**.

Complexity of data management for financed emissions

- The **complexity of solving the data problem** for financed emissions should **not be underestimated.** To provide portfolio coverage, a range of internal, external (subscribed) and publicly available information is needed. This extends across many data types; **emissions data**, **financial data**, **lending and investment information** as well as proxy data to **estimate emissions**.

Scope and purpose of the paper

The scope of this paper is data sourcing for financed emissions measurement under the following key areas:

- Practical support on **where to get started** on your journey and understanding the **complexity.**
- Common **data challenges** experienced by those already disclosing financed emissions.
- **Ten key criteria** to support **selecting data sources** and **providers**, including coverage, quality, regional, industry, structural, timing and relationship considerations.
- **Next steps** for firms both **beginning** or **enhancing their financed emissions models** and data environments.

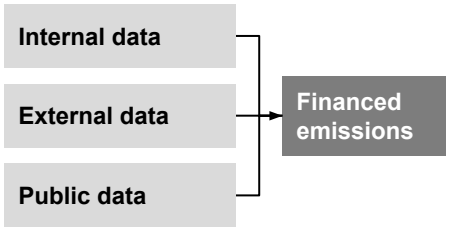
How do I get started?

Overview

- This paper focuses on data through three lenses, namely, **data sources, data challenges** and **key criteria** for selecting data providers from a carbon footprinting perspective for financial institutions.
- It should be noted that firms do need to initially set out the portfolios in scope as well as their disclosure objectives (e.g. alignment to industry standards and guidance e.g. IFRS S2, PCAF). In addition, this includes defining the boundary and phase of delivery in terms of the inclusion of industries, asset classes, value chain inclusions etc. is an initial step in beginning the journey in estimating financed emissions. Although further detail on this is out of the scope of this document, these considerations will have an impact on the data sources required.
- Further data requirements surrounding the end-to-end net zero journey will be provided in subsequent papers.

Where do I start in sourcing data?

A major complexity of financed emissions carbon footprint modelling is the need for both internal and external (both third party providers and publicly available) data. The reliance on multiple data sourcing avenues drives limitations around coverage and completeness for these types of models. When unavailable, counterparty emissions require estimation (mostly via use of proxies). Idiosyncrasies may arise when estimating across different asset classes and industry sectors but firms can actively manage the risk around proxies and estimation uncertainty.



- **Internally sourced data –** financial and counterparty characteristic data is a key component of financed emissions models. Here, information around the level of financing or investment of a client is a key part of the attribution approach. Other relevant internal information includes classification details (e.g. region, industry, asset class). Firms may also have a view of their clients' financial information as well.
- **External (subscribed) data** – for financial institutions, information on their clients' emissions footprint is a key data input for their Scope 3 measurement. This largely involves sourcing the Scope 1, 2 and 3 emissions of the entities within their portfolio, as well as data around production, revenues and asset sizes to estimate emissions. This is coupled with financial information on enterprise value, investment and transaction volumes.
- **Publicly accessible data** – the last data sourcing avenue extends from energy rating building information (e.g. for mortgages) to industry studies on average emission rates (e.g. for oil and gas). In addition, financial institutions may seek to complement subscribed data platforms with scraping reported information themselves (e.g. from public reports).

What data elements are needed for measurement?

- As well as there being multiple avenues for sourcing data, complexity is heightened by the number of data element types needed to measure financed emissions.
- While from a final calculation perspective, the attribution of emissions is typically straightforward (formula below against likely sourcing avenues), much of the challenge is driven by sourcing reliable direct data and using this data to proxy when direct reported emissions (and company financials) are not available.

$$\textbf{Financed emissions} = \frac{\textbf{Outstanding amount} \text{ [Internal data]}}{\textbf{EVIC or Debt+Equity} \text{ [External, Internal or Public]}} \times \textbf{Emissions} \text{ [External or Public]}$$

Example PCAF approach for business loans or unlisted equity. Calculation varies across other asset classes such as mortgages or motor vehicles.

To support this complexity, we have proposed a classification system to help support firms in navigating their data type needs. Here we provide data type examples across the categories – **primary, secondary** and **tertiary** data types specific for financed emissions:

Primary data types:

- **Reported emissions data** – entity reported emissions across Scopes 1, 2 and 3, validated reported emissions.
- **Entity financial data** – company valuations including enterprise value, debt and equity, revenue, asset size.
- **Entity lending, investment and transaction data** – outstanding loan balance, loan commitment, transaction volumes, original property value.
- **Entity classification data** – details around the investment industry, asset class, region, loan purpose, activity in the value chain.

Secondary data types: Industry and asset class data for estimation – average emission intensities, production volumes, revenues, asset size, consumption volumes, conversion factors and additional data support proxy development.

Tertiary data types: These are data types that have been derived from the primary or secondary data sources but have been adjusted to address limitations. They help with improving coverage but pose the challenge of classification as they may not be explicitly aligned with any of the 5 PCAF scores.

Lastly, it should be noted that this is PwC's illustrative approach to simplify data classification and to help support the complexity of data sourcing.

Common data challenges observed across the industry

Key data challenges across financed emissions modelling

Some of the common data challenges experienced across the industry include the following:

- **Data lag or timing mismatch** between financial reporting and the reporting of required emissions-related data for borrowers or investees.
- **Data unavailability** as not all entities report their emissions. Some countries also do not report emissions at all.
- **Data inconsistencies and conflicts** across same data types from different data providers.
- **Granularity limitations**, for example, some providers may combine Scope 1, 2 and 3 into a single value and for dual fuel motor vehicles, the split of percentage usage of each fuel type is usually not available. This is particularly important given the ISSB requirement to disclose scopes 1-3 separately.
- **Verifiability of data**, including unavailability of verified emissions and proper understanding of data construction from third parties.
- **Data inaccessibility**, for example, not all commercial real estate and residential mortgages have a current energy performance certificate (EPC) rating.
- **Stability** of the data as some data sources override old data with new data without maintaining any history.
- **Rates considerations**, including the impact of foreign exchange rates and inflation/deflation on some data types such as GDP data.
- **Validity** in the sense that at a specific time, the data may not be the best representation of emissions, for example, the impact of Covid on baseline emissions.
- **Age of the data** as data can become out of date and therefore not suitable for modelling financed emissions as it can no longer be deemed representative.
- **Engagement strategies** including communicating purpose and progress to stakeholders of results but also the the management of model and on-going monitoring, particularly with constant changes in data availability.

The 'data quality score' concept and industry guidance

The choice of data provider and data type sourced can have a significant impact on the overall data quality score that is coupled with reported financed emissions estimates.

One important aspect of the PCAF Standard is the provision of carbon footprint options to estimate emissions when reported data is unavailable. In addition, the disclosure of a 'data quality score' to accompany the financed emissions estimate is also required.

This methodology allows all firms a way to begin their portfolio carbon footprint journey regardless of the data limitations associated with reported emissions. It also provides a comparison tool for stakeholders to benchmark the uncertainty and data methods used to derive the footprint estimate against other firms.

PCAF has been signed up to by many institutions (over 490 globally) for their carbon footprinting of financial activities. To varying degrees, it is mentioned by a number of standards such as the European Sustainability Reporting Standards (ESRS, E1 Climate Change: article 44(b)) and TCFD (via its supplemental guidance). It should be noted however that the landscape is dynamic and continually developing.

The ISSB (IFRS S2 Climate-related disclosures) provides guidance on the use and prioritisation of multiple data inputs around Scope 3 (all categories) measurement. Prioritisation lenses such as: (1) using direct data, (2) data specific to activities of the entity (i.e. best representing entity's actual activities), (3) timeliness and (4) verified data should be considered (with judgement to be executed on the prioritisation order and trade off between lenses).

The ISSB also states that inputs used should be a 'faithful representation' of the entities activities and introduces the terminology of primary (data obtained directly from specific activities within the entity's value chain) and secondary data sources (data not obtained directly from activities within the entity's value chain). This correlates highly with our categorisation framework specific for financed emissions (primary, secondary, tertiary) proposed in this paper, with the ISSB advising entities to prioritise direct data in most cases, given it is the most likely data to be reflective of their value chain.

PwC offers the GHG Emissions Analyser, offering comprehensive market insights on sustainability reporting and net zero strategy, including data quality scores across different asset classes and industry sectors. Please contact us if this would be of interest to your firm.

Solving the data source challenge

Ten criteria to support your data provider sourcing

There are many considerations that go into sourcing and selecting of both external and public data providers. Here, we provide key criteria to supporting these decisions.

01 **Client coverage**

02 **Accuracy, consistency and timeliness**

03 **Representativeness of region and sector**

04 **Relationships and costs**

05 **Data formats and structures**

06 **Trusted sources and third party specialty**

07 **Benefits and drawbacks of multiple providers**

08 **The firm's data quality score ambition**

09 **Authenticity of sourced data**

10 **Governance and assurability**

Deep dive into the ten criteria

1. Client coverage

Obtaining data **coverage** across the entire portfolio (all asset classes and industry sectors) efficiently is one of the biggest challenges for financial institutions. While not all entities report, there may be deviations in the coverage of entities from third party providers. The **completeness** of emissions data sourced will reduce the reliance on proxies and having to deploy missing data treatments. This can include ensuring data covers the value chain and scope categories (e.g. external providers may not capture all scopes of emissions)

2. Accuracy, consistency and timeliness

Having consistency across the footprinting methodology is important to limit biases in the calculation and ensure compatibility. Ensuring the external provider and the choice of public data matches the modelling scope (i.e. footprint year) across the model is an important consideration in addition to using data that is still relevant from a timeliness perspective. If using data with a time lag, this approach should be consistent over multiple reporting years, in line with the ISSB. Data quality should be assessed from an accuracy perspective, as well as accessing data that is timely and relevant. In addition, when using multiple external data sources, different estimates can be obtained for the same counterparty when different sources are leveraged. This creates accuracy, reliability and consistency challenges.

3. Representativeness of region and sector

The use of the data from a validity perspective needs to be considered across the range of data types. Is emission information sourced in the UK valid for use for global proxies? Should property consumption averages be based on size, type or region? The suitability of data should be supported and rationalised in all circumstances, which includes considering how internal data and external data interact (e.g. internal data on property type may be more reliable than dwelling size so may be the better option when selecting a proxy to estimate emissions.

4. Relationships and costs

Financial institutions should consider previous and existing relationships in regards to third party data requirements. In addition, whether third parties are able to achieve any bespoke requirements of the institution and how it can best support the individual profile (i.e. sector mapping, regional locations, timing of data). FIs should balance the marginal benefit of improving data sources with any costs required, noting the ISSB requirement that firms report emissions '**without undue cost and effort**'.

5. Data formats and structures

Assessing the data structure from the provider can minimise the processing and treatments needed for digestion into models. This can also impact the data quality score assigned. Examples of this include providers reporting all emission scopes together (i.e. not splitting out between direct and indirect categories of Scope 1, 2 and 3), providers including technology type alongside production data (e.g. electricity generated by wind as opposed to coal) and providers not capturing Scope 3 emissions. Therefore, the alignment between the financed emissions models, and the sourced data format (and variables) is important for firms to consider during and post development.

"While deriving a **carbon footprint** appears straightforward, it is the **high reliance on internal and external data sources**, and **limitations inherent in current emission reporting** that drives the **high complexity** and **practical challenges** in measuring and managing financed emissions."

Solving the data source challenge

Criteria to external data selection (cont.)

6. External data provider expertise

Firms need to consider the expertise of the data provider for both different types of assets and estimation approaches. Can data be sourced from official **government** providers? Have specific data sources been **prescribed** in the PCAF estimation guidance e.g. Sovereign assets (UNFCC). In addition, certain providers may have certain expertise while aiming to be a single one-stop solution. Examples include consortiums that might be better at collating reported emissions across the industry, others experts in activity data around production used for proxies (e.g. number of barrels produced) or provide a view as to whether reported emissions have been verified (allowing for the best data quality score to be achieved). These aspects should be considered when developing your data provider architecture.

7. Benefits and drawbacks of multiple providers

As firms move from tactical to more mature strategic solutions, there is scope to increase data coverage by establishing multiple relationships of the same data type (e.g. multiple external sources for reported emissions). Here, a priority ranking of third party data providers and performing analysis on the completeness of providers' datasets can help support the coverage challenge. However, financial institutions need to balance the net gains of further coverage with increasing data processing and aggregation complexity to optimise the efficiency and manageability of the data environment, without causing undue cost and effort.

8. Balancing data quality score ambitions with resources and cost

The sourcing of external data will have a direct impact on the data quality score assigned. The IFRS S2 standard requires entities to "use all reasonable and supportable information that is available to the entity at the reporting date without undue cost or effort" (IFRS S2, B39). PCAF provides the flexibility to meet this requirement with its data quality approach. Firms can set their data quality ambitions based on the information they have available balancing portfolio coverage and data quality whilst they move towards sourcing verified emissions (i.e. data quality score 1).

9. Transparency of sourced data

This includes understanding the full data development background from external providers. Do they match to a golden source (i.e. exactly as reported by the entity) or have they been estimated, processed or adjusted for limitations? Many external providers are now also providing solutions for entities with unavailable data (e.g. machine learning estimates). This means that understanding the exact sourcing of the data inputs (and any manipulation applied) is imperative to transparency and accuracy of the disclosures. Firms cannot use external providers without fully understanding how emissions have been derived by the third party, including any gap-filling exercises.

10. Governance and documentation

All methodologies and data sources need to be adequately documented and understandable within the business. In addition, with movement towards assurance of non-financial disclosures, this includes the use of data from third parties. Therefore, while consideration to data lineage, controls, and frameworks is important - strong governance practices and assurability of the underlying external data sources is imperative, particularly as there can be direct impacts on the data quality score assigned and reported

External and public data source examples

Data category	Example sources
Reported emissions data (primary)	Bloomberg, S&P TruCost Environmental, Refinitiv, CDP, ISS ESG Solutions, ESG Book Annual and sustainability reports, Asset resolution PAMs
Financial data (primary)	Bloomberg, Refinitiv, Capital IQ S&P, Dun and Bradstreet ESG Intelligence, Dealogic Cortex, Bloomberg (Transaction listings and League tables)
Emission estimation data (secondary) Data used to estimate specific emissions for industry sectors and asset classes	Respective government websites (property, conversion data, transportation), PCAF emission factor databases, Asset resolution PAMs (production volumes), ISS, National statistics bureaus (e.g. ONS, ABS), UNFCCC, OECD, The World Bank, Cirium (Aviation), Bloomberg, S&P Trucost Environmental, Refinitiv, CDP (consumption data), CDP Climetrics (climate ratings), Ecoinvent, IPCC, GEMIS, FAO (crop data), Defra, EXIOBASE, GTAP, WIOD, IFI, IEA
Additional emission data providers Additional offerings may help support the data limitations observed in the industry	Bloomberg, CDP, MSCI, Refinitiv Eikon, Thomson Reuters, ISS ESG, Sustainalytics, S&P/Trucost Academic Literature

External data providers: Example external data providers across the broad categories of (1) Emission data, (2) Financial data and (3) Emission estimation data

Note: These are examples only and the list may not be exhaustive. We do not in any way recommend any specific data provider. Data providers vary in their coverage of asset classes / industry sectors / geographies.

Industry next steps on the data improvement journey

Next steps on the data improvement journey

Financial institutions that are yet to measure their financed emissions should consider planning to meet external expectations on net zero ambitions. Despite the complexities, data should not be a roadblock. The PCAF Standard allows estimating a carbon footprint using both direct emissions and proxies to suit ranging data quality score ambitions. Furthermore, it is a requirement of IFRS S2 to report emissions estimates when direct reported emissions are unavailable.

Those firms that are now planning the second and third generations of data and modelling solutions should consider the following next steps to enhance their journey:

Balance between portfolio coverage and simplicity from a data lineage perspective

Simplification of data sources can lead to more efficient and effective data processing and preparation. Given the need for many data types (e.g. emissions, financials, internal classification, consumption and conservation factors), placing more reliance on a single source for each data element type will help reduce overall complexity and data management requirements. While a priority system across providers can increase coverage, firms should assess the added benefits and overlaps, especially as provider data completeness improves over time.

Automated data quality processes

Developing controls and automated processes will support assessment for completeness, accuracy, validity, and overall sense-checking. Emissions information can easily go missing or nonsensical results can occur due to the high data volumes and transformations required. Automated data profiling tools can enhance efficiency in reasonableness reviews.

Data driven output variability and sensitivity testing

Firms can analyse the impact on outcomes of varying sources (e.g. Bloomberg instead of CDP, consumption by dwelling type instead of region) either at development, to determine a best candidate, or post model production, to understand the impact of varying the priority structures and role of proxies. The PCAF Standard suggests sampling tests to extrapolate higher quality data score emissions up to portfolio level to test the accuracy of low data quality score estimates.

Continued movement towards higher rated data sources

While proxies are a start to carbon footprinting, financial institutions should aim for better estimation approaches and higher coverage. The ISSB requires entities to use the best available data at the time of reporting, without undue cost or effort. This will improve the data quality score and give a more accurate reflection of the financed emissions footprint.

Refining proxy development approaches

The granularity of data used to define proxies at production, revenue, and asset levels is crucial in data and model development. Financial firms sourcing data reflective of their region, industry, and asset type can use more precise and representative proxies. Managing risk from data proxies, particularly around reliability, relevance and performance monitoring, is a key area where firms are looking for support.

Data management and monitoring

Moving towards centralised data management systems integrated with wider ESG data processes requires considering data controls, governance, reporting, horizon scanning, and risk management. The high volume of data sources also requires the monitoring of data feeds over time to understand and explain data and emissions changes.

> “Being able to navigate the data challenge is crucial given the impact it has on both **sustainability reporting** and strategic implications in achieving **net zero alignment**.
>
> Sourcing the appropriate data for financed emissions is complex and the challenge should **not be underestimated**.
>
> Nonetheless, reporting with lower quality data is better than not reporting at all. Firms should **continuously work towards improving their data quality** without **undue cost and effort** especially as they think about target setting and hence understanding the impact of various decarbonisation levers on their balance sheet.
>
> Our **10 criteria** can **support** you in data sourcing as your embark on your **net zero journey**.”

How can PwC help?

PwC can support your data sourcing and management needs

- **Benchmarking of data providers** – we can support in benchmarking data providers to ensure connectivity to model design ambitions. This includes support in the vendor selection process to ensure maximum coverage of your portfolio, benefits and limitations and efficient allocation of spending.
- **Data management framework development** – support on frameworks used to support the review, assessment and ongoing quality of financed emissions data environments.
- **Support improving your data quality score profile** – including roadmaps to source and ingest improved data into the model design.
- **Gap analysis of financed emissions models** – methodology assessment against our 12-step end-to-end framework covering scoping, data, model design and reporting, which applies insights from leading industry guidance.
- **Development of financed emissions quantification models** – to automate carbon footprinting and project of emissions towards targets

  Please contact to discuss our Portfolio Emissions Manager tool
- **Development of emission proxies** – developing approaches to derive proxies that are robust and consistent with the available data.
- **Analytics and insights on reported financed emissions** – post quantification analytics to support decisioning, insights to senior stakeholders and modelling enhancement programs.
- **PwC Data Brokerage** – ESG Data Brokerage is a PwC in-house centralised repository of trusted data from reputable providers. This helps clients with bespoke ESG data insights which are critical in shaping tangible actions that support their Net-Zero Transformation. Insights from data across carbon emissions, water usage, waste management, alignment with the Paris agreement and carbon earnings at risk - all from trusted and reputable sources.

Please contact us to hear more about our ESG Data Brokerage Service.

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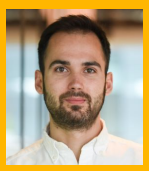

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