Allianz Global Investors

Carbon metrics: why many are better than one

Mastering a range of carbon metrics is crucial for investors to assess the climate impact of their investment decisions, and to monitor carbon targets.

Measuring, monitoring and reporting on carbon emissions is essential for investors to track and improve their environmental impact. But with various carbon metrics in use, and considerable complexity, it can be hard to decide the appropriate approach.

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In this guide, echoing the topic of **climate impact to climate transition** from our 2025 sustainability themes, we provide an overview of the main portfolio-level carbon metrics and explain why it is important to employ a range of these tools.

How emissions are measured

Carbon metrics attempt to quantify greenhouse gas emissions, which are expressed as tonnes of carbon dioxide equivalent (tCO_2e). Here are some of the key metrics.

Key takeaways

- Carbon metrics aim to measure greenhouse gas emissions associated with an investment portfolio.
- There are various carbon metrics to choose from, depending on factors such as an investor's share of equity ownership and the size of the portfolio.
- The choice of carbon metric can have a significant effect on the emissions estimate, which means a range of metrics should be used to ensure a balanced analysis.

Exhibit 1: Comparison of some key carbon metrics

QUESTION	METRIC	PROS	CONS
What are the greenhouse gas emissions financed by my portfolio based on my share of enterprise value including cash (EVIC)?	Financed emissions[1] (in tCO_2e)	• It provides an estimate of the greenhouse gas emissions financed by the portfolio • It allows aggregation between equity and fixed income portfolios • It is aligned with most international initiatives and regional regulations including the Task Force on Climate-related Financial Disclosures (TCFD) and the Partnership for Carbon Accounting Financials (PCAF)	• It does not allow comparison of portfolios of different sizes • It can be impacted by market fluctuations
What are the greenhouse gas emissions financed by my portfolio based on my share of equity ownership?	Financed emissions – equity ownership (in tCO_2e)	• It aligns real-world with portfolio decarbonisation • It apportions the companies' emissions, which, by formula, is less sensitive to market fluctuation	• It is not aligned with most international initiatives nor regional regulations (only TCFD) • It can only apply to an equity portfolio
What is my portfolio's exposure to carbon intensive issuers by sales?	Weighted average greenhouse gas intensity by sales (in tCO_2e per millions of portfolio currency sales)	• It allows comparison of portfolios of different sizes • It is aligned with most international initiatives and regional regulations (including TCFD and PCAF) • It is a proxy of a portfolio's exposure to transition risks when compared with another portfolio or index	• It tends to be favourable to companies with the highest prices in their sectors • It is not directly comparable across sectors
What are the greenhouse gas emissions of my portfolio relative to its size?	Relative greenhouse gas footprint[2] (in tCO_2e per millions of portfolio currency)	• It allows comparison of portfolios of different sizes • It is aligned with most international initiatives and regional regulations (incl. TCFD and PCAF) • It allows for normalisation of asset under management growth at portfolio level • It allows identification of the issuers that contribute the most to the portfolio carbon footprint	• It does not reflect carbon efficiency of companies in the portfolio • It can be impacted by market fluctuations • It may be more volatile than the "weighted average greenhouse gas intensity by sales" metric

1) Also referred to as "absolute greenhouse gas footprint".
2) Also referred to as "carbon footprint".

Why the choice of carbon metric matters

Let's consider a portfolio making a single investment in an automaker and see how it performs at two different points in time (see Exhibit 2).

We assume that over a one-year period, the market capitalisation of the automaker has doubled, and the enterprise value including cash (EVIC) has increased by 2.5 times, all other factors remaining equal. In this case, the "weighted average greenhouse gas intensity by sales" and "financed emissions – equity ownership" metrics would remain unchanged, while the "relative greenhouse gas footprint" and "financed emissions" would experience a notable decrease. However, this decrease would not be related to any real-world decarbonisation.

This is just one example of how complex metrics can be, and why relying on a single metric can potentially lead to misleading results.

What are the implications for investors?

As there is no "one size fits all" when it comes to measuring the emissions performance of investment portfolios, we suggest using multiple metrics simultaneously. Different metrics may yield different results depending on factors such as market capitalisation and total debt, which can vary with shifts in market valuations, earnings and debt financing choices.

When comparing carbon metrics, it is important to keep in mind the ultimate aim of this analysis, which is to drive credible portfolio decarbonisation. Carbon metrics are an important tool to assess the transition pathway of underlying companies – and to help reduce emissions in the real economy.

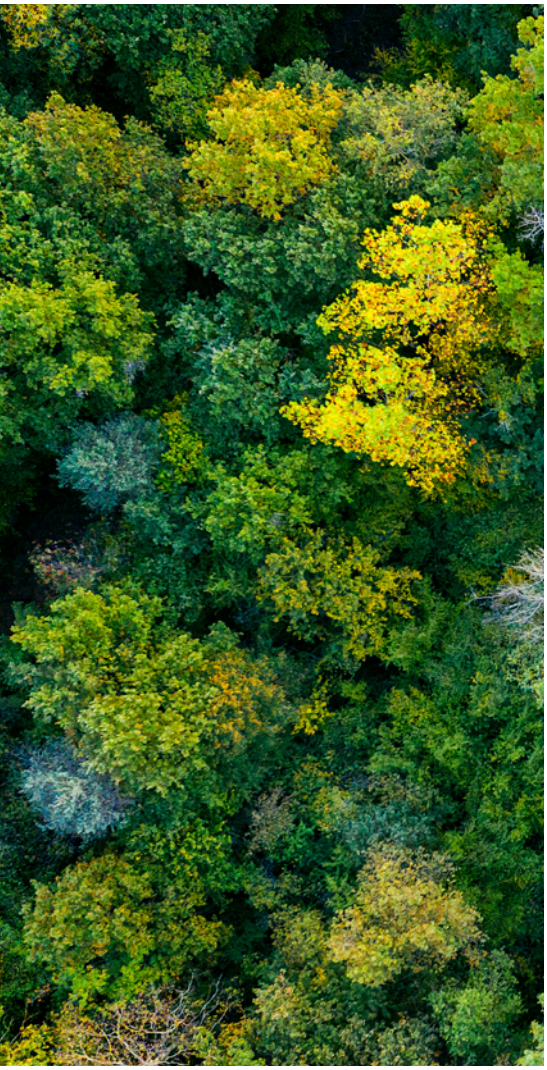

Exhibit 2: Emissions comparison for a sample portfolio

	Financed emissions (in tCO_2e)	Financed emissions – equity ownership (in tCO_2e)	Relative greenhouse gas footprint (in tCO_2e per EUR millions)	Weighted average greenhouse gas intensity by sales (in tCO_2e per EUR millions sales)
Year 1	34.00	215.13	17.00	16.83
Year 2	27.20	215.13	6.80	16.83

Source: MSCI ESG, AllianzGI. Data are provided for indicative purposes only.

Exhibit 3: How the carbon metrics are calculated

Metric	Formula
Financed emissions (in tCO_2e)	$\sum_{i=1}^{N}(\text{Issuer}_i\ \text{GHG emissions} \times \frac{\text{Holding in issuer}_i}{\text{Issuer}_i\ \text{EVIC}})$
Financed emissions – equity ownership (in tCO_2e)	$\sum_{i=1}^{N}(\text{Issuer}_i\ \text{GHG emissions} \times \frac{\text{Holding in issuer}_i}{\text{Issuer}_i\ \text{equity value}})$
Relative greenhouse gas footprint (in tCO_2e per millions of portfolio currency)	$\frac{\sum_{i=1}^{N}(\text{Issuer}_i\ \text{GHG emissions} \times \frac{\text{Holding in issuer}_i}{\text{Issuer}_i\ \text{EVIC}})}{\text{Portfolio net asset value}}$
Weighted average greenhouse gas intensity by sales (in tCO^2e per millions of portfolio currency sales)	$\sum_{i=1}^{N} w_i \times (\frac{\text{issuer}_i\ \text{GHG emissions}}{\text{Issuer}_i\ \text{sales}})$

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