

Understanding a fund's carbon footprint

A fund's carbon footprint measures its exposure to climate change-related risks. Here, we discuss our chosen measurement approach, what it tells us, what it doesn't and how we manage its limitations.

The meaning of a carbon footprint

Carbon footprints can be used to measure the exposure of an investment fund to climate change-related risks arising from the inclusion of securities of different companies in the fund. A carbon footprint measures emissions by companies of greenhouse gases (GHGs) that contribute to global warming and environmental pollution. There are six GHGs, identified in the Kyoto Protocol: not only carbon dioxide (CO₂), but also methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆). To calculate a carbon footprint, emissions of each GHG are measured in tonnes, and for the five non-CO₂ gases this output is converted into an equivalent amount of CO₂ emissions. Each of the five gases has a conversion factor for the calculation of its CO₂ equivalent, based on its global warming potential (GWP) over 100 years. Converting all GHG emissions to a carbon dioxide equivalent (CO₂e) in tonnes means that a carbon footprint can be expressed as a single number.

Why carbon footprints matter

Investors can have both ethical and economic reasons for concerns about carbon footprints. From an ethical perspective, it is generally recognised that GHG emissions are contributing to global warming and climate change, with rising sea levels and more extreme weather conditions, and to pollution of the atmosphere, seas and rivers (for example through smog and acid rain). From an economic perspective, companies that are big emitters of GHGs could see their costs raised by regulations, and in some cases their very existence might be threatened, for example by bans on the sale of petrol and diesel cars. Fossil fuel resources could become stranded assets. For example, if thermal coal is no longer used to generate electricity, some coal assets might have little or no value and will remain in the ground. But the mining companies that own them could still be left with liabilities – workers' pensions, compensation for illnesses such as black lung disease, and environmental clean-up costs. Many coal companies in the US have already gone bankrupt, sometimes repeatedly.

How we choose to measure carbon footprints

Governments are requiring large companies to report their carbon footprints. For example, since October 2013, the UK has required quoted companies to report their GHG emissions. However the regulations do not specify the method of measurement that should be used. There are many different ways of measuring or expressing emissions and carbon footprints, and investors need to rely on a suitable method. The preferred method should be reasonably simple to calculate and apply consistently across the major asset classes, such as equity and corporate debt. It should also link carbon footprints to investment, so that investors can track the carbon intensity of companies and industries in their portfolios, and make comparisons between portfolios.

For the purpose of measuring individual companies' carbon footprints, CO₂e emissions are usually measured as the combined total of scope 1 and scope 2 emissions, excluding scope 3 emissions (see definitions overleaf). While scope 3 emissions are clearly important, there is currently still considerable heterogeneity in the way in which companies calculate and disclose them.

Understanding emissions: The three scopes

In the late 1990s, the Greenhouse Gas Protocol was established to set accounting standards to measure and manage GHG emissions and encourage companies to report on their emissions via a corporate responsibility report. The GHG Protocol defined three key “scopes” for categorising emissions.

 Scope 1	 Scope 2	 Scope 3
Direct emissions generated on site, for example at company facilities or via company vehicles.	Indirect emissions generated from electricity purchased or used by an organisation.	All other emissions that are related to an organisation’s activities, but not under its direct control - for example because they are generated by suppliers, or because they are associated with the use of a company’s products (eg cars).

Source: J.P. Morgan Asset Management. For illustrative purposes only.

Choosing a measurement approach

GHG emissions for individual companies can be used to measure the carbon footprint for an entire investment fund or portfolio. There are four different widely accepted ways of doing this.

The simplest metric is total carbon emissions generated by a portfolio: for example if a fund owns 1% of the market capitalisation of a company, it is responsible for 1% of its total CO₂e emissions. The total carbon footprint is then calculated by adding up the fund’s share of the CO₂e emissions of all the companies in the fund. A problem with this measure is that it is difficult to compare the carbon footprints of funds or portfolios of different sizes.

A second method of measuring the carbon footprint of a fund or portfolio is relative carbon emissions. This relates total CO₂e emissions of a fund to the portfolio’s total size, and calculates emissions per USD 1 million invested. An advantage of this method of measurement is that comparisons can be made between the carbon footprints of portfolios of different sizes. A weakness is that carbon footprints can increase or fall with changes in market values, even though the carbon emissions of portfolio companies might not have changed.

Carbon intensity is a method that measures emissions relative to the output of the companies in a fund or portfolio: in other words, it considers a company’s polluting efficiency or inefficiency relative to the level of its business output. Typically, sales revenues are used as the best measure of output. This accounts for the fact that some companies produce more valuable goods and services with a given amount of CO₂e emissions than others. This method calculates the fund’s share of the carbon emissions of each company (based on the percentage of the company’s capital that the fund owns), and divides this by the fund’s share of a company’s annual sales in USD millions. Carbon footprint is then expressed, for each company and for the entire fund, as an amount of CO₂e emissions in tonnes per USD 1 million of sales.

The fourth method of measuring the carbon footprint of a portfolio is weighted average carbon intensity. Under this approach, the carbon intensity of different companies that a fund invests in is not scaled by how big an investment is relative to the market capitalisation of the company, but is instead weighted by how big the investment is relative the size of the fund. The total carbon footprint is again expressed as CO₂e emissions in tonnes per USD 1 million of sales. However, this method is more flexible and can be used for investments in both equities and debt securities.

	Weighted average carbon intensity	Total carbon emissions	Relative carbon emissions	Carbon intensity
Definition	Measures a portfolio's exposure to carbon-intensive companies	Measures the total annualized absolute greenhouse gas (GHG) emissions of a portfolio	Measures the total annualized absolute greenhouse gas (GHG) emissions of a portfolio per USD mn invested	The carbon efficiency of the portfolio, determined by measuring the volume of carbon emissions per dollar of sales generated by portfolio companies
Calculation Methodology	Sum of the security weight multiplied by the security carbon intensity.	Sum of the proportionate carbon emissions of companies in the portfolio based on the investor's ownership share	Sum of the proportionate carbon emissions of companies in the portfolio based on the investor's ownership share, divided by the size of portfolio	Apportion by the investor's ownership share, then divide the portfolio's total carbon emissions by the portfolio's total sales over the same period of time
Application	Proxy for a portfolio's exposure to potential climate change-related risks	Reporting a portfolio's total carbon footprint	Allows comparison with benchmark and other portfolios	Normalises portfolio emissions by investor's claim of sales
Units (in CO2 equivalent GHG)	Tons CO2e/ USD mn revenue	Tons CO2e	Tons CO2e/ \$M invested	Tons CO2e/ USD mn owned revenue
Asset class	Equity, fixed income	Equity	Equity	Equity

J.P. Morgan Asset Management's chosen measure is weighted average carbon intensity. It measures the exposure of a portfolio to carbon-intensive companies in a comparable way that can be applied to both equity and fixed income investments, and so can be used as a proxy for a portfolio's exposure to climate change risks, for comparison with other portfolios or with a target or benchmark. We therefore consider it to be the most useful metric for our portfolio managers to monitor and manage climate change risks, as well as to inform investors who want to take carbon exposure into account.

No measure is perfect, however. Though various protocols and standards are, to some degree, harmonising the measurement of portfolios' GHG emissions, there are still differences in reporting. In addition, measurements of carbon footprints are only as good as the data from which they are calculated. Data quality varies between countries and companies, and some companies still do not report emissions, in which case data providers (such as MSCI ESG CarbonMetrics) use their own methods of estimation.

Another limitation is that weighted average carbon intensity cannot be applied to all portfolios. It can be measured for direct exposures to company securities, i.e. equity and debt. However, it does not consider indirect exposures via derivatives such as index futures; does not account for any short positions; and does not take into account government debt and currency exposures in portfolios.

A moving target

Any measurement of carbon emissions is by its nature backward-looking, and does not allow for the fact that many companies are adapting their business models. For example, in response to new regulations in 2020, shipping companies are either switching to lower sulphur fuels or are installing "scrubbers" to reduce the emissions created by higher sulphur fuels, and energy companies are shifting their fuel mix from coal towards natural gas and renewables. Other firms are offsetting their emissions through carbon-reducing activities, or by trading emissions credits in regions such as the EU.

Our analysts carry out deeper research, and use their judgement to take a view on whether headline carbon emissions reported by companies could overstate or understate their true footprint over time. Carbon footprints can be complemented with more forward-looking measures that help to forecast higher carbon emissions (which could come from fossil fuel reserves, focusing especially on coal, oil sands, shale oil and shale gas) or lower emissions (which could come from cleaner technologies, energy efficiency, alternative energy, sustainable water or pollution prevention).

The potential to modify - or even radically change - business models provides a basis for our teams to build a constructive dialogue with companies around improving disclosure and governance, and reducing carbon emissions over time. Some companies have mirrored governments in setting out ambitious multi-year or even multi-decade targets that eventually commit them to becoming carbon neutral, with no net emissions of GHGs. Carbon footprints are a moving target.

To find out the carbon intensity of any of the funds in our (OEIC or) SICAV range(s), please see the quarterly ESG Fund Report for the relevant fund, available on our website or from your usual J.P. Morgan Asset Management representative.

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