

Sustainability business insights

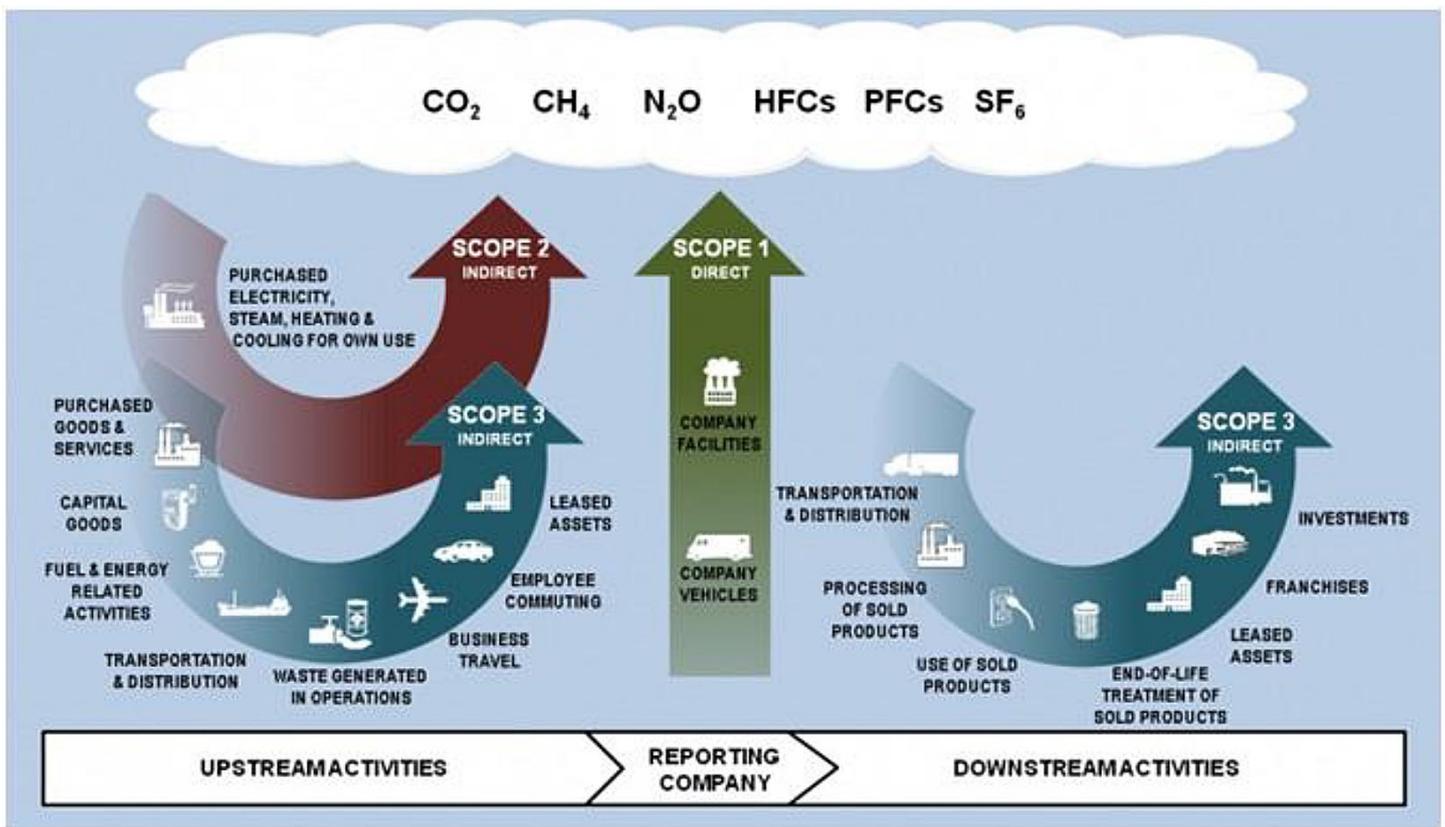
Carbon footprinting



What is a carbon footprint?

A carbon footprint is a calculation of the total Greenhouse Gases (GHGs) emitted directly or indirectly by an organisation, individual, product or service. Usually expressed as carbon dioxide equivalent (shortened to CO₂e), a carbon footprint accounts for the six GHGs included in the Kyoto protocol of 2007 – carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, perfluorocarbons and hydrofluorocarbons. Use of the CO₂e method allows the impacts of the different GHGs noted above to be compared on a like for like basis.

An organisational carbon footprint measures all GHG emissions related to business activities, including energy use for heating and lighting, company transport and industrial and commercial processes. It is also possible to include supply chain emissions in your organisational footprint if you decide this is worthwhile.



GHG emissions are categorised into three scopes:

Scope 1 – Direct emissions – resulting from activities under control by an organisation, for example burning natural gas in the site heating system.

Scope 2 – Indirect emissions – resulting from electricity, steam or heat purchased and used. The organisation is not directly in control of the emissions, but by using energy is indirectly responsible for CO₂ release to the atmosphere.

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Scope 3 – Emissions – other sources of indirect emissions outside of an organisation’s control, for example purchased goods and services and staff travel.

Scope 1 & 2 emissions should be included in an organisational footprint, however businesses can use discretion as to which, if any, Scope 3 emissions to include. Commonly, organisations include waste to landfill, water use, purchased goods and services and staff travel. Choice of Scope 3 emissions is driven by the purpose of the footprint, availability of robust data and an understanding of which sources of emissions can or could be influenced – be realistic when selecting Scope 3 sources.

Why calculate an organisational carbon footprint?

There are several reasons that drive businesses to calculate their carbon footprint, including:

- to ensure accurate reporting of their footprint to internal and external stakeholders
- to quantify and manage GHG emissions and demonstrate reduction over time

While some larger organisations have a mandatory requirement to report emissions, many businesses that publicise their carbon footprint do so voluntarily for a variety of reasons, for example as part of a corporate social responsibility programme. As the transition to a net zero and a low carbon economy gathers pace, and the importance and visibility of corporate environmental performance increases, more and more businesses clearly see the value of carbon footprinting as a tool to understand, manage and reduce their CO₂ emissions.

How to calculate your organisation’s carbon footprint

Calculating a basic operational carbon footprint can be a straightforward task if the relevant information is available, however accounting for all your organisation’s Scope 1-3 carbon emissions can be a complex and challenging project. The GHG Protocol Corporate Standard provides a standardised global approach to estimating GHG emissions and provides tools and training on best practice methodology.

It is important, as a first step, to set clear and realistic operational boundaries that include the main Scope 1 & 2 emissions and then decide which Scope 3 emissions will be included. When deciding on the scope of the carbon footprint, a transparent approach is required to ensure the footprint is representative of the main operational aspects of the business. Following the five key principles of the GHG Protocol – completeness, relevance, transparency, accuracy and consistency – will ensure the footprint is robust.

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A baseline year, representative of normal operating conditions, should be chosen to allow carbon reduction targets to be set and progress monitored over time.

Data collection is the first step in the footprint calculation process. Relevant consumption data for all emissions sources included in the scope of the footprint needs to be collated. Undertaking the data collection exercise will also assist in improving energy management. For gas and electricity, data in kWh units should be used, this is available from billing or direct meter readings. Other fuel consumption data (for example oil, LPG) can be collected in the most appropriate units such as litres and kWh as emissions factors for these units are readily available. To calculate vehicle transport emissions, actual fuel use is the best data to use, otherwise mileage data can be utilised to estimate fuel use using fuel economy assumptions. A simple spreadsheet, as below, can be utilised to record data.

Emissions factors can be built into energy monitoring spreadsheets to allow CO₂ emissions for individual activities to be auto calculated, collated and reported. The methodology outlined in the GHG Protocol for the calculation of emissions involves using activity data (for example kWh electricity) and emissions factors (for example kgCO₂/kWh). It is essential to use robust emissions factors, such as those published regularly by UK Government department BEIS.

Gas 2020				
Month	kWh	Days	kWh/ day	TCO2
Jan	41000	31	1323	7.530
Feb	50000	29	1725	9.150
Mar	0	31	0	0.000
Apr	0	30	0	0.000
May	0	31	0	0.000
Jun	0	30	0	0.000
Jul	0	31	0	0.000
Aug	0	31	0	0.000
Sep	0	30	0	0.000
Oct	0	31	0	0.000
Nov	0	30	0	0.000
Dec	0	31	0	0.000

Calculating Scope 2 emissions – electricity use at site requires an additional level of detail to ensure accurate reporting. There are methods of calculating Scope 2 emissions depending on the source of supply:

- **The Location based method** – this uses the grid average emissions factor for the UK
- **The Market based method** – this uses the specific emissions factor related to the purchased electricity.

Carbon offsetting

Carbon offsetting is a method of compensating for residual CO₂ emissions by participating in, or funding, projects that remove CO₂ from the atmosphere. Offsetting often involves paying a third party to avoid or remove emissions equivalent to those produced by your activities. Before using offsets, a business should first reduce CO₂ emissions as much as possible through efficiency and reduction methods.

Your business must have a credible strategy for offsetting emissions, and offsets must adhere to three guiding principles – CO₂ emissions offset must be additional, verifiable and in perpetuity. Carbon credits from offsetting schemes can be bought via brokers and scheme organisers, however care needs to be taken to ensure the offset schemes deliver CO₂ reduction as per the principles noted above. Projects should be certified (for example Gold Standard) to give comfort that carbon reduction will take place. There is an increasing interest in GHG /carbon removal projects that align with the net zero ambition, and these projects focus on removal of pollutants in the atmosphere, for example by large scale afforestation.

Further Reading & Links

GHG Protocol - <https://ghgprotocol.org/>

[UK Guidance on how to measure and report your greenhouse gas emissions](#)

BEIS emissions factors - [Greenhouse Gas Reporting: Conversion Factors 2021](#)

ISO 14064 - Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.



If you are interested in finding out more about the topic of this guide or any other aspect of making your business more sustainable please contact the Scottish Enterprise Sustainability team by emailing sustainability.specialists@scotent.co.uk.