CARBON TRUST

Carbon footprinting

The next step to reducing your emissions

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67%

of consumers across the UK, France and Germany would like to see a recognisable carbon footprint label on products.

About this guide

This guide introduces two types of carbon footprinting that affect businesses – one that measures an organisation's overall activities, and one that looks at the life cycle of a particular product or service.

Calculating either or both of these footprints is an essential starting point for any wider work to reduce your organisation's carbon emissions, and will give you an initial benchmark against which to measure your progress.

For some organisations, reporting their carbon footprint is a mandatory requirement.This includes quoted companies – those that are UK incorporated and whose equity share capital is officially listed on the main market of the London Stock Exchange; those which are officially listed in a European Economic Area; and those dealing on either the New York Stock Exchange or NASDAQ. Many other companies choose to report their carbon footprint as part of their Corporate Social Responsibility strategy.

Ultimately, carbon reporting will help your business to understand its carbon emissions and identify opportunities to reduce costs, improve your reputation and manage long term business risks. In this guide we explain what is included in both types of footprint, how you can measure and communicate them, and the benefits of doing so.We also set out the specific steps you need to take to calculate your footprint(s), and some of the key things to consider if you do.

Finally, we explain how the Carbon Trust can help you calculate your carbon emissions, and work with you to develop a full carbon management strategy for your organisation.

Introduction

As a first step towards managing and reducing your organisation's greenhouse gas emissions, you need to understand what emissions are caused by its activities or products.

All businesses have the opportunity to reduce their carbon emissions, and the business case for doing so is growing ever stronger.

- Higher and more volatile energy costs are increasing the value of energy savings
- Companies report their carbon footprints to meet the mandatory reporting requirements of climate change legislation such as the Carbon Reduction Commitment (CRC) or EU Emissions Trading Scheme (EU ETS)
- Carbon footprint reporting is a key part of many companies' Corporate Social Responsibility (CSR) programmes
- Companies that manage their carbon emissions responsibly can enhance their brand value, and make themselves more attractive to potential customers and investors
- It enables companies to participate in carbon reporting initiatives such as the Carbon Disclosure Project (CDP)
- Companies increasingly receive requests for carbon emissions data from businesses, customers and investors
- A baseline carbon footprint is a requirement for setting a Science Based Target – a greenhouse gas emission reduction target in line with latest climate science to limit global warming to 2°C

A carbon footprint is the total greenhouse gas (GHG) emissions caused directly and indirectly by an individual, organisation, event or product, and is expressed as a carbon dioxide equivalent (CO2e). A carbon footprint accounts for all six Kyoto GHG emissions:

- carbon dioxide (CO_2)
- methane (CH_4)
- nitrous oxide (N_2O)
- hydrofluorocarbons (HFCs)
- perfluorocarbons (PFCs)
- sulphur hexafluoride (SF_6)

Carbon dioxide equivalent

Carbon dioxide equivalent (CO_2e) is the unit of measurement which allows different greenhouse gases to be compared on a like for like basis relative to one unit of CO_2. CO_2e emissions are calculated by multiplying the emissions of each of the six greenhouse gases by its 100-year global warming potential (GWP).

Different types of carbon footprints

This publication looks at different types of carbon footprint:

- Organisational footprint (scopes 1 & 2 – see page 4-5)
- Supply chain footprint (scope 3 – see page 8)
- Product carbon footprint (see page 16)

An organisational carbon footprint measures the GHG emissions from all the activities across the organisation, including energy used in buildings, industrial processes and company vehicles.

A product carbon footprint measures the GHG emissions over the whole life of a product (goods or services), from the extraction of raw materials and manufacturing right through to its use and final re-use, recycling or disposal.

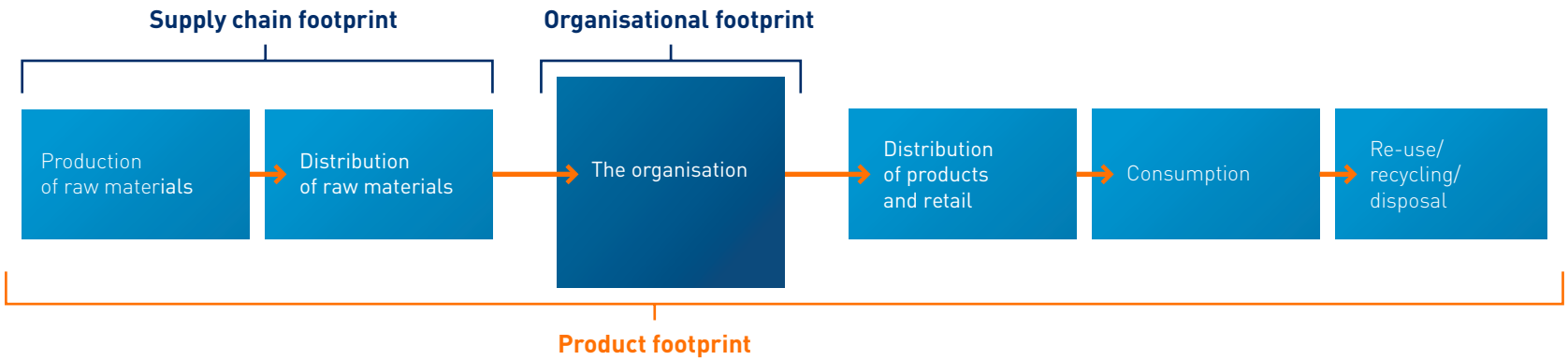
The different boundaries of organisation, supply chain and product foorprints are illustrated below.

A supply chain carbon footprint measures the carbon impacts of the raw materials and services that are purchased by an organisation in order to deliver its service(s) and/or product(s).

Organisations typically try to identify their most carbon intensive suppliers to target engagement effort.

The production process itself is part of the product life cycle, but would also be included in the organisational footprint – so there is some crossover between the two types.

Figure 1 The different boundaries of organisational and product footprints



Organisational carbon footprints

An organisational carbon footprint measures the direct and indirect GHG emissions arising from all the activities across an organisation.

What is it used for?

Quantifying GHG emissions will help you understand what your key emission sources are, how your organisation contributes to global emissions, and what opportunities you have to reduce your emissions. You can then develop a carbon reduction plan, identifying ways to reduce your carbon footprint and limit emissions from future activities – and then measure what progress you have made.

Once you've calculated your organisational carbon footprint, you can report it internally, externally or do both.

The Greenhouse Gas Protocol Standard

The Greenhouse Gas Protocol is a widely used standard that sets out how to account for your GHG emissions. It categorises emissions into three groups or 'scopes':

- Scope 1: Direct emissions that result from activities within your organisation's control. This might include on-site fuel combustion, manufacturing and process emissions, refrigerant losses and company vehicles.
- Scope 2: Indirect emissions from any electricity, heat or steam you purchase and use. Although you're not directly in control of the emissions, by using the energy you are indirectly responsible for the release of CO_2.
- Scope 3: Any other indirect emissions from sources outside your direct control. Examples of scope 3 emissions include purchased goods and services, use of sold goods, employee commuting and business travel, outsourced transportation, waste disposal and water consumption.

Under the GHG Protocol, all organisational footprints must include scope 1 and 2 emissions. There is more flexibility when choosing which scope 3 emissions to measure and report, and you can tailor these to reflect your environmental and commercial goals.

The best approach depends on what you intend to use the footprint for, the data available to calculate it, what you want to monitor and which sources you can influence. Organisations commonly include waste sent to landfill and employee business travel from scope 3.

Figure 2 Three 'scopes' of carbon emissions

Scope 1	Scope 2	Scope 3
Fuel combustion	Purchased electricity, heat and steam	Purchased goods and services
Company vehicles		Capital goods
Process emissions		Fuel- and energy-related activities
Fugitive emissions		Upstream transportation and distribution
		Waste generated in operations
		Business travel
		Employee commuting
		Upstream leased assets
		Downstream transportation and distribution
		Processing of sold products
		Use of sold products
		End-of-life treatment of sold products
		Downstream Leased Assets
		Franchises
		Investments

Following protocol

The Greenhouse Gas Protocol (GHG Protocol) is an accounting tool used by organisations and governments to understand, quantify and manage their greenhouse gas emissions. It provides the world's most widely used greenhouse gas accounting standards.

It was created in 2001, when the World Resources Institute and the World Business Council for Sustainable Development identified a need for consistency in how organisations accounted and reported emissions, and together introduced the new standard.

Since then, it's been used by more than 1,000 businesses and organisations worldwide, and in 2016 at least 92% of Fortune 500 companies responding to CDP used the GHG Protocol directly or indirectly.

Why calculate your organisational carbon footprint?

Calculating your organisational carbon footprint is the first step towards reducing it. It also means you can report the figure or gain independent certification for marketing or corporate responsibility purposes, or to meet the requirements of climate change legislation.

There are two primary reasons to calculate your organisational carbon footprint:

- Manage your GHG emissions and make reductions over time.
- Report your footprint accurately to a third party.

In the UK all quoted companies are required* to report their annual greenhouse gas (GHG) emissions in their directors' report. Defra (the UK Department for Environment, Food and Rural Affairs) has estimated that reporting will contribute to saving four million tonnes of CO_2e emissions by 2021.

Quoted companies are those that are UK incorporated and whose equity share capital is officially listed on the main market of the London Stock Exchange; or is officially listed in a European Economic Area; or is admitted to dealing on either the New York Stock Exchange or NASDAQ.

Further information can be found at https://www.carbontrust.com/resources/guides/carbon-footprinting-and-reporting/mandatory-carbon-reporting/

Manage your GHG emissions and make reductions over time

Quantifying your GHG emission sources will help you understand what impact your organisation is having on climate change. This will help you identify and prioritise areas for reducing emissions, which will often result in cost savings as well[1].

The Carbon Reduction Commitment

The Carbon Reduction Commitment (CRC) Energy Efficiency Scheme is an emissions trading scheme that covers large public and private sector organisations in the UK (excluding state funded schools in England). It is mandatory, targeting emissions currently not included in the EU Emissions Trading Scheme or Climate Change Agreements.

It applies to organisations that use more than 6,000MWh per year of electricity and have at least one half-hourly meter settled on the half-hourly electricity market.

Participants in the CRC need to measure and report their electricity and gas supplies annually.

Note that the UK government announced in 2016 that the CRC energy efficiency scheme will be abolished following the 2018-19 year.

Read more about the CRC on: https://www.carbontrust.com/crc

1 Companies Act 2006 (Strategic and Directors' Reports) Regulations 2013

Report your footprint accurately to a third party

Increasingly, companies are calculating their carbon footprint in order to share the information with other organisations (for public disclosure). You might also want to do this in order to:

- meet the mandatory reporting requirements of climate change
- set a science-based target – a greenhouse gas emission reduction target in line with latest climate science to limit global warming to 2°C
- report emissions as part of a corporate social responsibility programme or for marketing purposes
- respond to requests from business, customers and investors for carbon emissions data
- participate in carbon reporting initiatives such as the Carbon Disclosure Project
- measure and report your emissions levels as part of a carbon reduction or offsetting strategy.

If you are going to publicly disclose your footprint or progress with its reduction, it's important to use a robust approach to calculating your carbon emissions. The GHG Protocol is the standard that the majority of organisations follow.

Carbon Disclosure Project

The Carbon Disclosure Project (CDP) collects and distributes information about organisations' carbon emissions.

Launched in 2001, it's a not-for-profit organisation that holds the largest database of corporate climate change information in the world. This data can be viewed by anyone, and is often of particular interest and use to investors, policymakers and their advisors, government bodies and academics.

Read more on the CDP website at www.cdp.net

Obtaining independent certification or validation can give external stakeholders more confidence that the methods have been used correctly and that the results are accurate.

What kind of organisation measures its footprint?

The types of organisations that have had their carbon footprints verified include:

- **Insurers – Aviva**
- **Universities – University of Kent**
- **Retailers – Next Retail Ltd**
- **Transportation – Transport for London**
- **Food manufacturers – ABP Food Group**
- **Hotels - Millenium & Copthorne Hotels**
- **Manufacturers - Kingspan**
- **Galleries and museums – The National Gallery**
- **Supermarkets – J Sainsburys**
- **Airports – Gatwick**
- **Pharmaceutical companies – GlaxoSmithKline**

Carbon Trust Footprinting Services

Organisational footprinting

Our footprinting analysis can be tailored to support the needs of your specific organisation. Measuring and understanding your organisation's carbon footprint is one of the first steps needed to cut carbon and energy costs – it enables you to measure subsequent savings, and it helps you to identify areas of energy wastage.

To enable organisations to calculate their carbon footprints we have two tools:

Organisational footprinting/reporting software

- Footprint Manager - a cloud-based reporting tool, enabling your organisation to measure, manage and reduce its carbon footprint (Scope 1, 2 and business travel in Scope 3)

Product footprinting software

- Footprint Expert - a desktop-based software tool enabling you to produce fast and consistent carbon footprint measurements for products and services

Renewable power & Scope 2 reporting

The more recent GHG Protocol Scope 2 guidance enables companies reporting their emissions to gain recognition for using renewable power. We can help companies assess low-carbon energy options and report their emissions correctly.

Supply chain and product footprinting

We develop footprinting models and product footprints that can be aligned to GHG Protocol Product Standard, PAS 2050 or ISO 14067, and analyse the data to pinpoint opportunities for your organisation. We also assess value-chain carbon footprints to identify broader risks and business opportunities around international markets, pricing strategies and entry points for new products and services. These are constructed in line with the GHG Protocol Value Chain (Scope 3) Standard.

Our product and supply chain footprinting work includes:

- **28,000 certifiable product footprints**
- **The Scope 3 Calculation Guidance for the WRI WBCSD Corporate Value Chain Standard and the PAS 2050 Standard for Product footprinting, which we co-authored**
- **Our experts were part of the committee for the development of both ISO14067 and GHG Protocol Product Standard**
- **The creation of leading product carbon footprinting software, Footprint Expert, used by companies in 17 countries**
- **A range of services that measure the entire value chain footprint of an organisation and even whole industries**

We also offer a range of assurance and certification services, including organisational and product footprint certification

The Carbon Trust Standard

The Carbon Trust Standard is the world's leading independent certification of an organisation's impact on the environment by verifying action on energy use and associated greenhouse gas (CO_2e) emissions, water use and waste output.

The Carbon Trust Standard recognises organisations that take a best practice approach to measuring and managing their environmental impacts, achieving real reductions in these year-on-year.

The standard provides a framework for organisations to enhance their operational sustainability, improve efficiency and resource management at the same time as cutting costs.

The Carbon Trust Standard for Carbon, Water and Waste can be achieved individually or in combination.

Certification offers real advantages:

Enhancing reputation

- Drive awareness of your environmental credentials among stakeholders, customers and staff
- Be recognised as an independently-verified environmentally responsible organisation
- Differentiate your brand in a crowded marketplace
- Improve staff morale, retention and the ability to attract new talent

Delivering efficiencies

- Resource energy 'hotspots' and opportunities for water efficiency improvements
- Benchmark your company's resource management performance
- Engage staff and customers in reducing resource use and cutting cost

Facilitating compliance

- Be prepared to robustly demonstrate performance under voluntary and mandatory environmental reporting frameworks such as:
  - » Mandatory reporting of GHG emissions
  - » EU regulations including ESOS and the CRC Energy Efficiency Scheme
  - » CDP Carbon & Water Disclosure Project
  - » EU non-financial reporting requirements
  - » BITC Corporate Responsibility Index
- Comply with contracting and procurement requirements for independently-verified environmental impact data and management frameworks.

Over 1,000 organisations around the globe have successfully certified their operations and are proud to bear the Carbon Trust Standard logo, including many leading companies and brands, as well as public sector bodies.

“Quantifying your GHG emission sources will help you understand what impact your organisation is having on climate change”

How to calculate an organisational carbon footprint

Accounting for all your carbon emissions can be a complex task, but calculating a basic carbon footprint that includes the main emissions sources is straightforward.

The key steps in calculating an organisational carbon footprint are:

1 Decide on the method to be followed

It is important to use a consistent method to ensure an accurate result, particularly if you will rely on several people to help collect and interpret data.

The GHG Protocol is one of the most commonly used standards. It provides detailed guidance on methods, and is available free of charge online. Another recognised standard is from the International Organization for Standardization, ISO 14064, which builds on many of the concepts introduced by the GHG Protocol. Both provide further explanation of the steps covered here.

2 Define organisational and operational boundaries

Set clear, explicit boundaries on which parts of your organisation are included in the footprint. This can be complex if you have many subsidiaries, joint ventures or leased assets, but it's an important step.

The operational boundary determines which emission sources will be quantified. It should include the full range of emissions from activities under your operational control. All material scope 1 and 2 emissions should be included, but you can choose which scope 3 emissions to include.

Be realistic when choosing a boundary and make sure you consider the practicalities of collecting complete and accurate data. It may help to fit in with your other reporting periods and legislative requirements, or the requirements of schemes operated by third party certifiers, such as the Carbon Trust Standard.

3 Collate the data

The accuracy of the footprint relies on collating consumption data for all of the emission sources within your established boundary.

For gas and electricity, collect data in kilowatt hours (kWh) from meter readings or bills. You can record data for other fuels in a variety of units, such as litres, kWh or megajoules (MJ). For transport emissions, collect fuel consumption by fuel type where possible (from fuel cards etc). Where this is not available, you can estimate consumption based on the mileage of the vehicles and fuel economy assumptions.

It's important to clarify any gaps in the data and list any assumptions that have been made in calculating the footprint.

4 Apply emissions factors

The carbon footprint is measured in tonnes of CO_2 equivalent (tCO_2e), and is calculated using the activity data collated multiplied by standard emissions factors. You can find updated emissions factors on the Carbon Trust website at www.carbontrust.com

5 Verify the results (optional)

You may choose to have a third party verify your carbon footprint, to add credibility and confidence to your carbon reporting for public disclosure.

6 Verify your emissions reductions (optional)

Many companies have not only measured their carbon footprint but have taken action to reduce it progressively over time. Reduction is something that a third party can certify to add credibility and confidence to your reduction claims.

For further information on measuring, verifying and certifying your organisation's carbon footprint call us on +44 (0)20 7170 7000

Scope 2 Reporting Guidance

The Greenhouse Gas Protocol (GHG Protocol) launched additional Scope 2 Guidance in 2015. This takes into account the fact that there have been significant changes to electricity markets globally, including deregulation in many markets. There is now more choice provided for companies regarding the type of electricity they purchase, and requirements for renewables have been introduced by many governments.

As a result of the new guidelines, many companies will now have to report two numbers instead of one for their Scope 2 carbon emissions. Where possible, companies are required to report Scope 2 emissions according to both a 'location-based' method and a 'market-based' method.

The location-based method

It involves using an average emission factor that relates to the grid on which energy consumption occurs. In Europe, this usually relates to a country-level electricity emission factor, and is effectively the same method required in the original GHG Protocol Corporate Standard.

The market-based method

It must be applied if the company has operations in any markets where energy certificates or supplier-specific information are available. This method involves using an emission factor that is specific to the electricity purchased.

The use of the market based method means that electricity from renewables or a green tariff are accounted for differently, usually resulting in lower carbon emissions reported. Electricity generated from fossil fuels must reflect the mix of fuels used by a particular supplier to generate the electricity. For the market based approach there is also a set of quality criteria which must be used to assess the quality of the certificates or supplier-specific information, and this must be disclosed as part of the company's greenhouse gas emissions report.

Calculating Scope 2 emissions using the market-based method will not be straightforward for businesses operating in some international markets, as the availability and quality of data will be variable.

Key steps to calculating your scope 2 market-based emissions:

- Find out what data is available (certificates and supplier-specific information) for the different types of electricity, heat, cooling and steam the organisation is purchasing for the different markets in which it operates.
- Identify relevant supplier-specific, and tariff-specific (where relevant) emission factors for accounting.

Example

If an electricity supplier generates 2MWh of electricity and half is from coal and half from wind, then the location-based method will be based on the average of all generation in the UK.

But, for the market-based method the supplier should provide certificates for 1MWh at the wind generation emission factor and for 1MWh at the coal emission factor.This provides a better representation of the carbon impact of the chosen electricity tariff, providing an incentive to select lower carbon tariffs.

Setting a Science-based Carbon Reduction Target

Many companies are already demonstrating that they have the skills, expertise and ingenuity to reduce their carbon footprint and increase their growth, but they want to ensure the transformational action they take is aligned with current climate science. Businesses can ensure they are playing their part in the global effort to limit global warming to well below 2°C by setting a science-based target.

While many businesses, charities and public bodies have set carbon reduction targets, in most cases they are short term (typically 5 year) timeframes and not connected to climate science. Science-based targets provide companies with a clearly defined pathway by specifying how much and how quickly they need to reduce their greenhouse gas emissions. There are a number of good business reasons to do this such as improving cost and resource efficiency.

More information can be found at www.sciencebasedtargets.org/

What is a science based target?

A carbon target is defined as 'science based' if it is in line with the level of decarbonisation required to keep global temperature increase below 2°C compared to pre-industrial temperatures, as described in the IPCC (Intergovernmental Panel on Climate Change) assessment reports and agreed at COP21 in Paris in 2015.

The benefits of setting science based targets include:

- **Demonstrate leadership**
  Demonstrate a leadership position by aligning your organisational targets with climate science.
- **Drive innovation and competitive advantage**
  Science based targets provide both a short and long term pathway to emissions reduction that drives innovation and competitive advantage.
- **Engage internal and external stakeholders**
  Create a 'buy-in' that helps drive the achievement of the target and the reduction of your carbon footprint.

Communicating your organisational carbon footprint

Once you've calculated your footprint, you're ready to publish it. Reporting your carbon footprint – and having it independently certified – can help engage your employees, customers and other stakeholders, and enhance your reputation.

If you decide to report your carbon footprint internally or externally, make sure the data is presented transparently.

This means providing complete information about each of the six steps in the previous section, including methods, footprint boundaries, data quality and assumptions. Try to keep a consistent approach when reporting changes over different years and explain the context, e.g. changes in the business structure.

Why communicate your footprint internally?

Communicating your organisational carbon footprint to employees can help engage them in the process of carbon reduction and energy management.

If you are going to ask people to try and save energy, it's important to show them what difference they are making to your organisation's emissions – which means they need to know the starting point and, ideally, the progress they are making. The data you collect may also help employees identify efficiencies in existing processes and practices.

Gaining certification can also give employees something to aim for and, once achieved, can help to retain and attract an increasingly environmentally-aware workforce.

Plus, of course, if you do manage to save energy, you'll see a reduction in costs – and a better bottom line.

Why communicate your footprint externally?

Communicating your organisational footprint externally – in your corporate social responsibility (CSR) report, for example – demonstrates that you are concerned with the impact your business is having on the environment.

For business-to-business organisations, many businesses that you are selling to may either require their suppliers to report emissions, or at least prefer to do business with companies with proven green credentials. A published and certified carbon footprint is a credible way of demonstrating this, particularly if it includes a carbon reduction plan, and can provide a company with a competitive edge.

For business-to-customer organisations, consumers are increasingly taking environmental issues into account. Publishing carbon footprints is a good way to give the customer confidence in the organization.

Product carbon footprint

A product carbon footprint is a measure of the greenhouse gas emissions across the life of a particular product throughout its 'life cycle'.

A product carbon footprint is the total sum of greenhouse gas emissions (CO_2e) produced throughout a product's lifecycle, including production, distribution and use. It includes emissions of your suppliers, customers and distributors related to the manufacture and use of the product. It also covers emissions created by disposing of any waste, and the impact of recycling.

What is it used for?

Measuring and analysing the carbon footprints of your products and services provides a wealth of usable data and key information that can be used to manage risks as well as to identify cost reduction and product-development opportunities. A product carbon footprint can be a useful tool to engage with employees, suppliers, investors and customers. It can motivate employees to take action to reduce emissions, build brand awareness and value, and support the actions of suppliers and customers in reducing emissions. It may also identify inefficiencies and cost savings in your own processes, and in the supply chain.

Certifying your product footprint allows you to gain an internationally recognised, fully independent measurement that can be used to communicate your product's resource efficiency, to drive sales, reduce costs and increase brand loyalty.

Measuring emissions from all stages of the product life cycle

A product carbon footprint is a measure of GHG emissions at each stage of the product's life, including:

- extraction and production of materials
- transportation of raw materials
- production (or service provision)
- distribution
- product use
- disposal/recycling

At each stage the analysis should include GHG emissions resulting from any material inputs to, or outputs from, the process. Commonly, these include energy use, transportation fuel and direct gas emissions such as refrigerant losses from air conditioning units and waste.

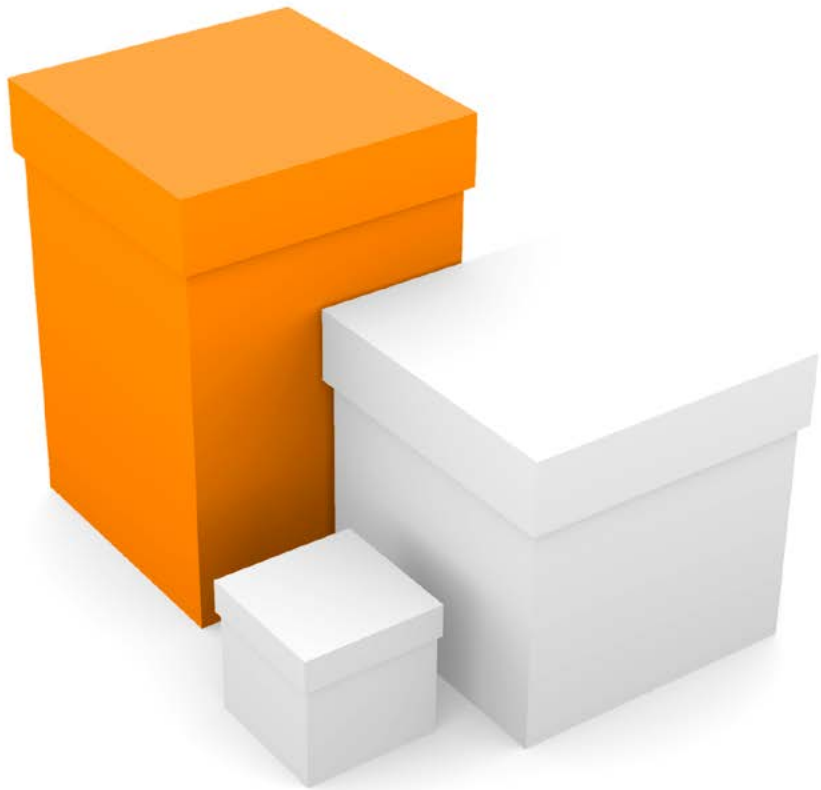
In the case of a 'service product' the life cycle stages are defined individually for each service.

Publicly Available Specification (PAS) 2050 (see page 19) provides a widely recognised, internationally applied and consistent method for assessing product life cycle GHG emissions. It can be used for a wide range of product and service types, including:

- goods and services
- manufacturers, retailers and traders
- B2B and business-to-consumer (B2C)
- supply chains – both UK and international

The Carbon Trust is the world's leading independent certification body for product footprints.

“A product carbon footprint can help to differentiate your product or service and enhance your brand image”



Why calculate your product carbon footprint?

A product carbon footprint offers a number of benefits, both in terms of differentiating the product or service you assess, and helping you better understand and manage your supply chains.

The three main reasons to calculate the carbon footprint of your product or service are to:

- drive change and reduce costs and emissions within your company
- communicate to interested third parties e.g. customers
- drive wider change in the supply chain.

Reduce costs and emissions

Identifying areas where you can reduce GHG emissions will often result in cost savings, in terms of transport energy, waste and packaging. For example understanding the carbon impact of your supply chain more clearly can also help you manage the potential risks climate change might bring to your business – and reduce your emissions – by changing:

- suppliers
- choice of materials
- manufacturing processes
- method of delivery
- product designs

It can also help you gain the support of your employees, and encourage them to take action.

Tell people

Customers, employees and shareholders are becoming increasingly aware of the environmental impact of the goods and services they use. A product carbon footprint can help to differentiate your product or service and enhance your brand image. Committing to or demonstrating carbon reductions can help you attract new customers. You may also consider using third party endorsement of the footprint – e.g. through the Carbon Reduction Label – to validate your claims.

Drive wider change in the supply chain

It's important to look at your whole product supply chain, rather than just one part, as this will let you see all the opportunities to reduce emissions. You can then take positive action to reduce the total emissions, which will benefit everyone more than shifting emissions within the chain.

It can also help you develop better relationships with your suppliers, by helping them identify and eliminate inefficiencies in their own processes.

How to assess your product carbon footprint

Assessing the carbon footprint of a product requires a consistent approach to enable you to compare it with other products or services.

Use a standard method

Current guidance for calculating a product carbon footprint includes the PAS 2050, which was published in October 2008 (and revised in 2011) following extensive development and international consultation, ISO 14067 and the GHG Protocol Product Life Cycle Accounting and Reporting Standard. All three are applicable to a wide range of goods and services, and include the scope of analysis, collating data and calculating GHG emissions. They give guidance on how to treat emissions relating to issues such as recycling, renewable energy and land use change.

To make sure your calculations are consistent, it's a good idea to use baseline data (including standard emission factors and process calculators) as well as the guidance provided by PAS 2050 or ISO14067. In the future, the International Life Cycle Database (ILCD) will provide consistent data across sectors.

The GHG Protocol Product Standard, released in 2011, also provides requirements to quantify the GHG inventories of products, and includes requirements for public reporting. For more information on the Product Standard see the Greenhouse Gas Protocol website.

Define the scope and objectives of the product carbon footprint

Before you start, be clear about:

- why you are measuring the footprint – is it to be used internally to analyse the supply chain or publicly disclosed?
- what level of detail you need – is a high-level approach that identifies carbon hot spots sufficient, or do you need a detailed analysis that can be independently verified?
- who is available internally to carry out the analysis, and how long will it take? Would you benefit from independent, external advice or verification of your footprint?

The next step is to choose a representative product or service 'functional unit' on which the carbon footprint will be based and reported – e.g. per kg or per hour of service – and work to engage your supply chain in the measurement process.

Assessing the product footprint

The PAS 2050 sets out five basic steps to determine a product carbon footprint:

Step 1 – Build a process map

List all of the materials, activities and processes that contribute to each stage of the chosen product's life cycle.

Step 2 – Check boundaries and determine priorities

Some emissions can be excluded, e.g. consumer travel to retail outlets. Calculating a high-level footprint first will help focus data collection on the main GHG emission sources and eliminate others.

Step 3 – Collect data

Collect activity data (e.g. litres of fuel consumed per product unit) and select appropriate emissions factors (e.g. $kgCO_2$ per litre of fuel). Where possible, use primary data based on actual meter readings or records rather than estimates.

Step 4 – Calculate the footprint

Calculate the GHG emissions ($kgCO_2e$ per product unit) from each source by multiplying the activity data by the emissions factors.

A product carbon footprint is a useful tool to engage with employees, suppliers, investors and customers

Step 5 – Verify your footprint

You can verify your footprint in three ways:

- self-verification
- verification by another party, such as another company
- accredited independent third-party verification.

While self-verification is a simple choice, it lacks the reputational value of accredited independent verification.

Verification by another party provides greater impartiality by ensuring someone not involved in the process reviews the footprint assessment.

Independent third-party verification provides the greatest certainty and impartiality in the accuracy of the footprint, as the verifier has been independently certified by a national accreditation body.

Communicating your product carbon footprint

Now that you've calculated the carbon footprint of your product you need to tell people about it, and ideally about your commitment to reducing it.

You can communicate your carbon footprint in a number of ways, such as labelling your products, or providing information on your company's website or marketing campaigns. The method of communication will depend on what sort of business you have, how you want to communicate your footprint and who you want to tell.

Communicating internally

Communicating the carbon footprint of your product or service to your company as a whole can have several benefits.

- Lower energy costs. Using less energy to enable a reduction in your product footprint can help improve your bottom line.
- Engaging with employees. Communicating a product's footprint to your employees shows them your commitment to reducing climate change. It can also help to gain their buy-in to emissions reduction.
- Optimising processes. The information you've gained about the processes used in manufacturing your product or creating your service can help identify inefficiencies.

Business-to-business

B2B companies can realise significant benefits by communicating their product carbon footprints.

- Engaging up the supply chain. The information you've gathered during the process can also help your suppliers reduce their emissions, thereby reducing the footprint of your product.
- Engaging down the supply chain. You can provide your customers with valuable information about the carbon footprint of goods or services they purchase. This allows your customers to make an informed decision about what they buy and makes it easier for them to calculate their own carbon footprint.

  It also differentiates your product or service. As a B2B supplier you can provide your business customers with certified product carbon footprint data up to their gate, thereby reducing the time and cost they need to footprint their own products.

Business-to-consumer

B2C organisations can distinguish themselves from other companies by communicating their product or service carbon footprints and reduction commitments. This can be done through:

- point of sale
- reporting
- advertising
- labelling

Communicating your footprint to consumers by all or any of these methods, and then committing to reducing it, can help you realise further benefits, including:

- increased cost and emissions savings
- product differentiation – and increased sales
- enhanced brand reputation

You can support even further emissions reduction in two ways. First, the public commitment to reduce emissions over time helps create a sense of urgency across the supply chain. Second, by putting credible information in the hands of consumers, you help provide them with the knowledge they need to reduce their own impact on climate change.

Communicating your product carbon footprint can also help you differentiate your products. Consumers and retailers are beginning to demand 'low carbon' products and the information they need to make informed choices.

All of this will serve to reinforce your brand's reputation among consumers, and help make sure they continue to buy your product or service.

Labelling

Consumers and businesses alike have become more sophisticated and discerning in their buying decisions, increasingly expressing a preference for products and services that have rigorously validated environmental credentials. Other research has shown that, regardless of the product's actual carbon footprint, consumers prefer products that are carbon labelled:

- two thirds of consumers across the UK, France and Germany would like to see a recognisable carbon footprint label on products[1]

The Carbon Trust Footprint Label displays a commitment to measuring and reducing the resource footprints of your products, providing a clear visual signal for consumers and stakeholders. Universally recognised, the Footprint Label shows your customers, employees and stakeholders that you have taken steps to measure and reduce the resource footprint of your product, thereby reducing cost and demonstrating your commitment to environmental sustainability.

This allows you to foster brand loyalty, visibly differentiate your product and confidently demonstrate your commitment to sustainability.

You can find more information on the Carbon Trust Footprint Label at www.carbontrust.com/client-services/certification/product-footprint/

1. Source: https://www.carbontrust.com/news/2016/11/is-it-time-for-a-reinvigoration-of-product-carbon-footprint-labelling-in-europe/

75%

In France three-quarters of the shoppers say they would feel more positive about a company that has reduced the carbon footprint of their products, of which 30 percent would feel much more positive.

Who is footprinting their products?

A wide and diverse range of UK and international companies, ranging from supermarkets to banks, have calculated the carbon footprint of their products and services. They include:

- Amcor Group GmbH - Packaging
- Beijing, BOE Display Technology CO.,LTD
- Computer screens
- Bord Bia (Irish Food Board) - Dairy, beef, poultry, pork, and lamb
- Dyson Ltd - Hand dryers
- GSK - Pharmaceutical Products
- Gulf Cement Company PSC - Cement
- Marlow Foods Ltd / Quorn - Food products
- Marshalls PLC - Paving products
- Mila Hardware -Building products
- Samsung - Mobile phones
- Seed Hawk Inc - Agricultural machinery
- SmartestEnergy Ltd - Certified 100% Renewable Energy Tariff
- Tempo Beverages LTD - Israeli beer
- Winterhalter Ltd - Industrial washing machines

Go online for more information

The Carbon Trust provides a range of tools, services and information to help you implement energy and carbon saving measures, no matter what your level of experience.

Website – Visit us at www.carbontrust.com for our full range of advice and services.

➘ www.carbontrust.com

Tools, guides and reports – We have a library of publications detailing energy saving techniques for a range of sectors and technologies.

➘ www.carbontrust.com/resources

Events and workshops – We offer a variety of events, workshops and webinars ranging from a high level introductions to our services through, to technical energy efficiency training.

➘ www.carbontrust.com/events

Small Business Support – We have collated all of our small business support in one place on our website.

➘ www.carbontrust.com/small-to-medium-enterprises/

Our client case studies – Our case studies show that it's often easier and less expensive than you might think to bring about real change.

➘ www.carbontrust.com/our-clients

The Carbon Trust Green Business Fund – is an energy efficiency support service for small and medium-sized companies in England, Wales and Scotland. It provides direct funded support through energy assessments, training workshops, and equipment procurement support.

➘ www.carbontrust.com/greenbusinessfund

SME Network - Join a community of over 2000 small and medium-sized businesses to discuss your strategy and challenges to reducing carbon emissions and improving resource efficiency. Sign up for free to share knowledge, exchange useful resources and find out about the support and funding available in your area, including the details of your local energy efficiency workshops.

➘ www.carbontrust.com/resources/tools/sme-carbon-network

* **Subject to terms and conditions.**

The Carbon Trust is an independent company with a mission to accelerate the move to a sustainable, low-carbon economy. The Carbon Trust:

- **advises businesses, governments and the public sector on opportunities in a sustainable, low-carbon world;**
- **measures and certifies the environmental footprint of organisations, products and services;**
- **helps develop and deploy low-carbon technologies and solutions, from energy efficiency to renewable power**

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