Product Carbon Footprint Action Guide for Small and Medium Enterprises

In partnership with

Introduction

Understanding and reducing value chain (Scope 3) emissions is a critical lever for **shifting the global emissions trajectory and supporting decarbonization efforts**. Customers, investors and regulators increasingly expect transparency on the environmental impacts of products throughout their lifecycle, and Product Carbon Footprints (PCFs) provide a way to not only quantify these impacts but highlight where action can drive operational improvements, cost savings, and decarbonization.

Getting started with product-level carbon accounting can feel complex, especially for smaller, less resourced teams. This guide outlines the foundational concepts and practical steps that support SMEs as they begin to assess and manage the carbon footprints of their products.

What is a Product Carbon Footprint (PCF)?

A Product Carbon Footprint is a measure of the **total greenhouse gas (GHG) emissions generated throughout a product's life cycle, typically** expressed in CO_2 equivalents (CO_2e).

Calculating a PCF provides a comparable metric for assessing and improving the impact of a given product. A PCF can provide a quantified view of:

- Emissions across the product's life cycle
- How carbon-intensive the production of one unit of a product is, expressed in a comparable metric such as *kg CO_2e per unit*

- Progress over time, as PCFs can be used to track decarbonization and communicate improvements to customers and other stakeholders.

For example, a PCF might show that producing 1000 m2 of ceramic tiles results in 4.5 kg CO_2e/m2, with most emissions coming from raw material extraction and energy use.

Why do PCFs Matter?

For Small and Medium Enterprises (SMEs), PCFs are powerful tools because they can help you to:

- Identify **find emission hotspots** and prioritise actions where they will have the greatest impact
- Support **customer and supplier transparency**, building confidence and trust in your product-level emissions data
- Prepare your business for **future regulations** and procurement expectations
- Drive **innovation** in product design, sourcing, and operations.

What data goes into a PCF?

PCFs do not require perfect or complete data at the outset, credible estimates are an accepted and common starting point.

Every PCF is built from two core inputs:

(1) Activity data

Activity data quantifies the level of an activity that causes GHG emissions or removals. It describes *how much* energy, material, or transport is involved in producing a product.

Examples include electricity consumed in production, fuel used in transport, or material inputs per unit of product.

(2) Emission factors

Emission factors convert activity data into climate impact. They express the amount of GHG emissions released per unit of activity, typically in kg CO_2e per unit (for example, per kWh of electricity or per litre of fuel).

A PCF is calculated by multiplying activity data by the corresponding emission factor for each relevant activity or input material and then summing the results across the product's lifecycle stages. Simply put:

PCF value = Σ (Activity Data x Emission Factor)

This ensures that emissions from different processes, inputs, and energy sources are all accounted for in a consistent way.

Primary and secondary data sources

The Partnership for Carbon Transparency (PACT) is a global initiative, and the recommended approach by SME Climate Hub to SMEs, that enables companies to calculate, exchange and use product carbon footprint data in a consistent, and comparable way. PACT provides the tools that help companies, of all sizes, to share PCF data across value chains while improving accuracy over time.

PACT distinguishes between two types of data used for activity data and emission factors:

- **Primary data**: Company- or supplier-specific data that is directly measured, collected, or calculated (for example, site-level energy use or supplier-provided process data).
- **Secondary data**: Data not specific to a company or site, such as industry averages, proxy data or values from published databases.

For SMEs, the key is to start with available secondary data and progressively replace it with primary, supplier-specific data where it matters most.

A note: Most PCFs use a mix of primary and secondary data. PACT provides a clear data hierarchy to support organizations to start with available data and improve over time, increasing the use of primary and supplier-specific inputs as data maturity grows.

Where do we draw the boundary?

Not every PCF looks at the same parts of a product's life cycle. There are three common approaches:

- **Gate-to-gate**: Only what happens inside our own facilities
- **Cradle-to-gate**: from raw materials to your factory gate
    - This approach captures the largest share of emissions for most products whiles remaining manageable for SMEs
    - This is the standard required by the PACT Methodology and recommended starting point for most SMEs
- **Cradle-to-grave**: Full life cycle, including product use and disposal

Box 1: PCFs vs LCAs

Both Product Carbon Footprints (PCFs) and life cycle assessments (LCAs) evaluate the environmental impacts of a product, but they differ in scope and purpose.
A PCF focuses solely on climate change, quantifying greenhouse gas emissions in CO_2e. It

Getting Started

You do not need to be an expert or have perfect data to begin. Starting small and building over time is both acceptable and expected. The steps below outline a practical pathway for SMEs taking their first steps into product-level carbon accounting.

1. Pick one product to start with

Choose a product that is either:

- Simple (with fewer input materials as possible, or non-complex manufacturing processes)
- Supplied in high volume
- Strategically important to your business, or
- Likely to have a relatively high environmental impact.

Starting with one product helps you learn the process before scaling.

2. Define what part of the life cycle you will include

Most SMEs start with a **cradle-to-gate** boundary, which covers emissions from raw materials up to the point the product leaves your facility.
This keeps the scope manageable and focuses on the parts of the life cycle you have the most influence over.

3. Gather a small set of essential data

You do not need full LCA-level detail to begin. Start with:

- Quantities of input materials used to make one defined unit of product, (for example, 1 m^2 of tiles or 1 kg of polypropylene pellets)
- Energy used in the production process (electricity, natural gas, etc.)
- Transport distances and modes (e.g., shipments from suppliers).

Use primary data where you have it, and estimate the remainder using invoices, utility bills or internal records.

4. Fill gaps with credible secondary data

Not every supplier will be able to give you detailed information, and that is normal. Use publicly available databases, industry averages or reputable emission-factor datasets such as Ecoinvent, to fill data gaps. This is an accepted starting point and helps you move forward quickly.

5. Use a simple calculation tool or an excel spreadsheet to get started

Where possible, choose an accessible PCF calculation tool designed for beginners or SMEs. These tools combine your activity data with appropriate emission factors and make it easier to structure, document and update calculations across life-cycle stages.

If a dedicated tool is not immediately available, you may choose to start with a simple spreadsheet template. Many SMEs successfully start with simple spreadsheets before moving to dedicated tools as their needs grow.

Note that spreadsheets can quickly become difficult to maintain and scale, especially with complex product portfolios, so moving to a purpose-built PCF solution as early as possible is recommended.

6. Analyse results to find your hotspots

Look at which inputs or processes contribute most to the product's emissions. Typical hotspots for SMEs include:

- Input materials (especially metals, plastics, chemicals)
- Purchased energy
- Fuel burnt on-site.

Understanding these hotspots helps you focus improvement efforts.

7. Identify reduction opportunities

Examples include:

- Switching to lower-impact materials
- Reducing waste in production
- Improving energy efficiency
- Sourcing renewable electricity
- Working with suppliers to improve data or reduce emissions.

You do not need a full decarbonisation strategy on day one. Start with 1-2 achievable improvements that fit your operational reality and decision-making authority. Aim for quick wins or low hanging fruit.

8. Plan how you will scale

Once you have calculated one PCF, consider:

- Whether to assess more products,
- How to improve primary data collection,
- How to build supplier engagement,
- Whether to adopt more advanced tools or align with PACT fully over time.

Start small, improve over time

Calculating a Product Carbon Footprint is a journey, not a one-off exercise. For SMEs, the most important step is simply to begin, using available data, a manageable scope, and practical tools.

Over time, PCFs can become a powerful decision-making tool that supports customer transparency, operational improvements, and credible decarbonization.

By starting small and building steadily, SMEs can play a meaningful role in reducing value chain emissions while strengthening their business resilience.

Resources

Visit the PACT knowledge library for further guidance on methodologies, solution providers and more

https://www.carbon-transparency.org/resources

Going further: from PCF to climate solutions

If your PCF shows that your product has significantly lower emissions than conventional alternatives, it may qualify as climate solutions — products that are aligned with the 1.5°C ambition. The Exponential Roadmap Initiative's Climate Solutions Framework sets criteria to define and qualify climate solution products and companies. Explore the framework and contact ERI to learn how to qualify your product or company as a climate solution and engage with ERI's climate solutions network.