



**PE INTERNATIONAL**  
EXPERTS IN SUSTAINABILITY



## **Guide for Product Carbon Footprints**

How to calculate Product Carbon Footprints  
(PCF) for Electronic Products

## Product Carbon Footprint (PCF) for Electronic Products

### *Situation*

With complex supply chains, extensive outsourcing, and frequent product revisions, the electronics industry has long believed that collecting supply chain emission information is prohibitively expensive. But as industry leaders are proving, creating a carbon footprint for any electronic device can be fast and cost-effective, using the right tools and expertise.



In a sector where environmental efforts have often been motivated by a “regulate and reduce” mentality, market leaders are embracing a new paradigm. Instead of near-sighted focus on particular regulated materials such as heavy metals and halogens, a life cycle approach to sustainability assesses performance in a variety of environmental impact categories and informs a sustainability strategy which can anticipate, rather than respond to, regulatory pressure. This comprehensive assessment informs a more targeted and effective sustainability agenda, identifying environmental risks and pursuing areas for improvement across the supply chain.

### Product Carbon Footprints for the Electronics Industry

### *Challenge*

To comply with international standards for carbon footprinting (PAS 2050, ISO 14040, and the upcoming ISO 14067), a product carbon footprint has to account for emissions from cradle to grave – that is, from initial resource extraction to final disposal, including manufacturing, use-related impacts, and transportation or shipping. While a number of providers now offer databases of environmental profiles for common materials and processes –i.e. chemicals, metals, energy sources, or transportation networks- the constant development of new electronic components and the complexity of electronics supply chains presents a challenge to these tools or efforts to collect supply chain emissions data.



### *Solution*

This problem can be solved by using high-quality process-based datasets which accurately represent typical electronic components. PE International, creators of the GaBi 4 Life Cycle Inventory databases, provides market-leading environmental impact databases for creating product carbon footprints, including an electronics-specific emissions database. This database contains representative environmental profiles for a wide variety of electronic components – different types and sizes of integrated circuits, substrates, solders, and passive components. It is important that these datasets consider the full cradle-to-gate impacts for



the components they represent- for instance, the processing and auxiliary materials needed for fabricating electronic chips often have much higher impacts than the silicon wafer or plastic casing. Similarly, tiny amounts of gold on a printed circuit board can be just as environmentally significant as the print & etch process of the substrate.

With emissions dependent on the complex interaction between materials and processing steps, it is important that emission datasets and life cycle modelling be grounded in domain expertise. With nearly twenty years of experience conducting product sustainability studies, PE INTERNATIONAL is able to offer this expertise to complement other corporate sustainability efforts.

### *Benefits*

Serving as a toolkit for the device's carbon footprint, this database and other GaBi 4 datasets help quickly build up a model of the cradle-to-gate impacts for a new product. With data collection now limited to energy required for assembling the device, major transportation distances, and estimated use-related power consumption, this toolkit-based approach allows for rapid and cost-effective carbon footprinting.

Using this initial model to identify environmental "hot spots", targeted efforts can be made to collect supplier-specific emissions data, or opportunities for redesign can be identified. Taking a life cycle perspective and working with high-quality environmental inventory databases is helping leading companies tackle sustainability challenges, and chart a new path for the electronics industry.



### *Experience & Knowhow*

PE INTERNATIONAL has been the global leader in the field of Carbon Footprint Analysis and Life Cycle Assessment for 20-years. PE experts are administering product carbon footprint analyses all around the globe for industry leaders in the ITC, retail, logistics, metals, and chemical industries, many of them listed in the DowJones Sustainability Index. In addition to its consulting services, PE provides tools for assisting product and corporate carbon footprinting:

The SoFi platform for Corporate Sustainability Management is used to track and report corporate emissions, cutting the cost and time associated with sustainability reporting. With a centralized database for managing emissions reporting from worldwide operations, a robust data quality control system, and automatic report generation, SoFi streamlines corporate sustainability reporting. Learn more at [www.sofi-software.com](http://www.sofi-software.com)

The GaBi 4 electronics Life Cycle Assessment (product LCA) software and databases area used to speed the development of product carbon



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footprints for informing design and strategy decisions. With comprehensive databases accessed through an intuitive drag-and-drop interface, product carbon footprinting was quick and cost-effective. Learn more at [www.gabi-software.com](http://www.gabi-software.com)

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