

Measuring the Carbon Footprint of Electronic Parts



A new resource lets manufacturers track the carbon footprints of more than 300 million different electronic parts.

The global chip industry is facing an ongoing shortage of new chips and a surge of counterfeit chips. Valued at \$75 billion, the latter introduces substantial risks of malfunction and unwanted surveillance. In response, a group of researchers from Purdue University are proposing an optical anti-counterfeiting detection method for semiconductor devices.

For every 2.2 pounds of electronics produced, **nearly 50 lb of carbon dioxide (CO₂)** is released into the atmosphere. Cumulatively, the electronics industry is responsible for over half of the world's carbon footprint. In 2020, the sector emitted **580 million metric tons (MMT) of CO₂** and, if left unchecked, that number may grow to 852 MMT annually by 2030.

“Electronics have a far greater carbon footprint than their size or weight would suggest,” electronics repair and refurbishment company **Maxey Moverley** points out. “This is a function of the nature and variety of the precious metals used in their manufacture together with the massive carbon footprint of the computer chip (semiconductor) manufacturing process.”

With all eyes on environmental, social and governance (ESG) and sustainability right now, companies in the electronics industry are looking for new ways to reduce their carbon footprints. Some of their efforts include sourcing renewable energy, designing products with longer lifespans and offering “take back” programs for obsolete/unusable electronics.

A New Way to Measure Scope 3 Emissions

In July, design-to-source intelligence platform Supplyframe introduced a tool that manufacturers can use to access carbon footprint data for over 300 million different electronic parts. Electronics Product Carbon Footprint (PCF) allows organizations to measure the carbon footprint of components that are on their bills of materials (BOMs). Using that data, companies can develop a roadmap for suppliers and customers to reduce their CO₂ emissions right down to the individual part level.

The resource is meant to help companies go beyond just Scope 1 and 2 emissions and address Scope 3 indirect greenhouse gas (GHG) emissions. These emissions are produced primarily by the company's suppliers in the raw materials, transportation, and distribution sectors. Activities like supplier manufacturing, material consumption and transportation all contribute to Scope 3 emissions.

“Calculating Scope 3 emissions, the largest source of CO₂ (40%+) for manufacturers, has historically been cumbersome, time-consuming, and rarely performs as planned,” Supplyframe points out. “This lack of awareness created a significant blind spot for global manufacturers seeking to measure the entire carbon footprint of the electronics content in their portfolios.”

A Groundbreaking Move

The PCF is being introduced just as new European Union (EU) regulations and evolving U.S. rules are forcing manufacturers to identify how to quantify and report their supply chain emissions. The platform provides access to emissions data for millions of parts, putting needed information at users' fingertips. Previously, companies trying to calculate a roll-up value would take weeks or months to get this data at the part or component level of a complex BOM.

“Until now, engineers designing new products and procurement teams tasked with obtaining components for those products have had no way to evaluate the CO2 emissions of a new design or purchasing decision,” said Supplyframe CEO and founder Steve Flagg, in a [press release](#). “This capability gives them specific product carbon footprint details to meet regulatory reporting requirements and, ultimately, identify better alternatives that balance corporate goals of efficiency, cost optimization, and sustainability.”

Calling PCF a “groundbreaking move,” *Environment+Energy Leader* says that until now, companies have had “little to no information about CO2 emissions associated with the electronics components they purchase.” This has created a significant blind spot for global manufacturers seeking to measure product carbon footprint for electronics content in their innovation portfolios.

The market is also highly competitive. Industry giants are adopting product expansion strategies such as mergers and acquisitions, Fact.MR reports, while mergers and acquisitions help companies increase their product offerings and market reach. For instance, Infineon Technologies AG recently announced the acquisition of GaN Systems Inc., and Flosfia began offering next-gen power chips made from gallium oxide.

Overall Outlook Remains Positive-But-Cautious

The broader semiconductor market has been through some ups and downs lately as the sector emerged from the pandemic, shook off the impacts of the global shortage and caught up with demand for certain products. According to [KPMG's Semiconductor Industry Confidence Index](#), the current score of 54 is similar to that of 2023, with a value above 50 indicating a more positive outlook than negative.

According to KPMG, 83% of semiconductor leaders project their company's revenue to grow in 2024, which is in line with last year's 81%. However, the rate-of-growth projections are slightly lower. This year, four in 10 leaders expect revenue growth of more than 10 percent. While still healthy, a full half of respondents (5 in 10) felt this way last year.

Automotive topped the survey as the most important application driving semiconductor company revenue, with wireless communications coming in second and cloud/data centers and the Internet of Things tied for third place on organizations' top list of revenue drivers in 2024.