



## **TE CONNECTIVITY SUPPLIER REQUIREMENTS, PRODUCT CARBON FOOTPRINT (PCF) CALCULATION SPECIFICATION OF MATERIALS**

### **1. SCOPE**

This policy defines product carbon footprint (PCF)<sup>1</sup> calculation and modeling requirements for TE Connectivity's Suppliers and/or their subcontractors (collectively "Supplier(s)" hereunder). TE Connectivity requires all its raw material suppliers to submit a PCF value and the supporting documentation for the goods provided to TE Connectivity at the end of the calendar year 2025 the latest. That applies to the following products: semi-finished metal products, strips, rods, rings, bolts, screws, nuts, rivets, pins, resin products, molded plastics, diecast parts, ceramics, rubber. The PCF values and the supporting documentation of all other direct commodities; e.g. complex goods, electronics, IT Hardware, cables, application tooling, assembly tooling, must be submitted to TE Connectivity latest at the end of the calendar year 2026. This policy document describes the technical requirements and the specifications of the method, i.e. lifecycle analysis (LCA) modelling parameters and the greenhouse gas (GHG) accounting approach, assumptions, data quality thresholds and disclosure requirements of the PCF calculation approach.

### **2. GENERAL REQUIREMENTS FOR LIFE CYCLE ASSESSMENT (LCA) FOR PCF OF MATERIALS**

Supplier shall follow an industry standard LCA method in calculating the PCF of materials supplied to TE. TE Connectivity recommends the supplier to comply with the following standards: ISO 14040, ISO 14044, ISO 14067, GHG Protocol Product Standard as acceptable methods<sup>2</sup>. If a supplier follows a methodology standard other than those listed in here, a justification shall be given. Supplier must submit the LCA modeling parameters, data sources, and the methodological approach, of their PCF calculation along with the direct goods they supply to TE.

Supplier shall use primary data for its own operations, to the greatest extent possible and collect data from its TIER I suppliers to calculate their upstream product-related emissions. When primary data is unavailable or unpractical to obtain, supplier may use a verified secondary data source<sup>3</sup>. A list of recommended secondary data sources is given in ANNEX I. Suppliers may use country-specific and industry average GHG emission estimates for the components, materials, ingredients, and processes involved in the operations and supply chain. These estimates are subject to change as new updated data and improved methods become available from life cycle inventory (LCI) databases and improvements in manufacturing process and supporting operations. Supplier must report its primary/secondary data ratio in their PCF documents.

The presence of a transparent, well-documented system – in other words an audit trail - is the basis of successful data verification. Supplier should keep its own audit trail records of the data sources, calculation method, and the conversion factors, including but not limited to emission factors. TE Connectivity requires such information to be reported in the PCF document. TE Connectivity recommend its suppliers to submit a third-party data assurance/verification plan unless they have one in place already.

### **3. MODELLING SELECTIONS**

#### **3.1. Product description and the carbon footprint**

Supplier must submit the total GHG emissions intensity in weight unit of measure per weight of good provided to TE Connectivity (Unit of measure (UoM): kg CO<sub>2</sub>e / kg product). In addition,

<sup>1</sup> A PCF calculates the total greenhouse gas (GHG) emissions generated by a product over the various stages of its life cycle including material acquisition, manufacturing, distribution and transportation, usage, and end-of-life. The term is interchangeably used with carbon footprint of products (CFP).

<sup>2</sup> ISO 14040: Environmental management — Life cycle assessment — Principles and framework, ISO 14044: Environmental management — Life cycle assessment — Requirements and guidelines, ISO 14067: Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification, GHG Protocol Product Standard.

<sup>3</sup> Supplier may use country and industry averages if primary data is missing. Information sources must be given and validated.

part number per TE Connectivity part number system (TCPN), recycled content, primary / secondary scrap ratio, virgin material ratio, specifications, along with supplier product name, model, and material description including process flow.

### 3.2. Data Type

Supplier shall use primary data from its own operations and value chain to the greatest extent possible. Supplier may use secondary data, when primary data is missing or impractical to obtain. The source of secondary data must be reported in detail. Use of secondary data must be indicated in the LCA model. TE Connectivity recommends the use of secondary data from a third-party source only when the primary data is not available or unverified. A list of TE's recommended secondary data sources is given in the Annex. Primary / secondary data ratio shall be reported in the PCF document.

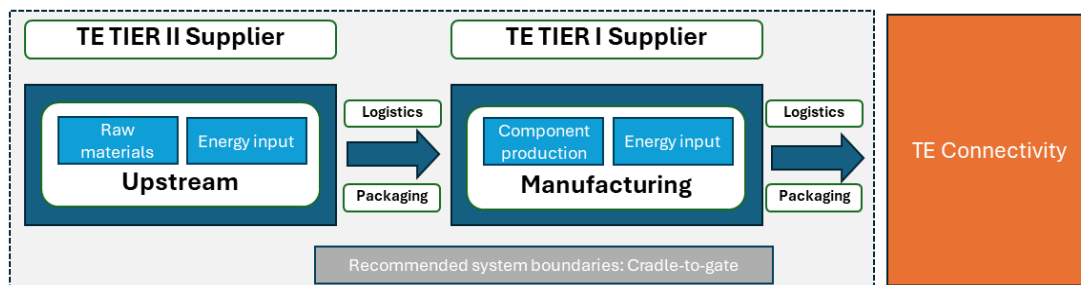
### 3.3. Declared functional unit and Unit of Measure (UoM)

The product carbon footprint unit of measure (UoM) must be given in metric weight kg CO<sub>2</sub>e/kg product. The functional unit must give the defined weight, e.g., 1 kg (weight) and/or 1 piece (quantity) of product name, number and departure point to the supplier. Additional units; e.g. dimensions, volume, etc. shall be given.

### 3.4. System boundaries

TE Connectivity recommends the supplier to use 'cradle-to-gate' LCA system boundary by default. This model is the most widely selected system boundary in the raw materials and manufacturing industry. Cradle-to-cradle, cradle-to-grave system boundaries are allowed as well. Cradle-to-gate PCF values must be given in the disclosure document. Additional breakdown of emissions on life-cycle stages, i.e., raw materials, manufacturing emissions packaging, and transport, end-of-life treatment are desired<sup>4</sup>. Figure 1 below describes the system boundaries recommended by TE to its raw materials suppliers.

PCF document should disclose the recycled content and scrap ratio, the material composition, and the polymer type if the material is organic. Scrap shall be categorized as run-around, pre-consumer vs post-consumer. The material composition of source raw material should be given. The supplier shall give the methodological reference to calculate the recycled content.



**Figure 1: Recommended system boundaries of the PCF calculations submitted to TE Connectivity**

<sup>4</sup> TE Connectivity recommends its suppliers to apply cradle-to-gate system boundaries by default. If the raw material includes negative emissions throughout its life cycle, e.g. biogenic emissions, removals, or such; supplier shall give emissions throughout the life cycle, including disposal and end-of-life.

### 3.5. Time-related scope

Supplier shall use the most recent historical data to calculate the PCF value. TE recommends to take the mean average of production conditions in the recent three years. Taking the data from the most recent year and two year(s) is acceptable. If historical primary data is missing, figures can be extrapolated and modeled. Estimation and extrapolation methods must be explained in detail. Background data should not be older than four years. Data belonging to 2020 and 2021 can be excluded, because of business fluctuations during those years due to the global pandemic.

### 3.6. Regional scope

The default level of geographic resolution shall be regional average, e.g., Europe, Middle East, and Africa (EMEA), Americas (AMER), and Asia Pacific (APAC). More resolute data at the country level is acceptable. Global averages are not preferred. Supplier must give global average only if more granular data is unavailable. In such cases supplier must commit to a data granularity and quality improvement plan. TE Connectivity recommends suppliers with operational in several regions to calculate PCF values for each region separately. Regional level of granularity to be set as Europe, Middle East, and Africa (EMEA), Americas (AMER) and Asia Pacific (APAC).

### 3.7. Software and database

The software used to model the LCA; e.g., GaBi, SimaPro, Umberto, iPoint, OpenLCA, etc. including its release version, year, and license owner shall be given. The lifecycle inventory database: e.g. Ecoinvent, ELCD, NMD, the release year, model number, must be given. The identifier number of the emission factors chosen from the database must be given.

### 3.8. Assurance, Verification, Certification, and its use

TE requires its suppliers to submit a third-party verified assurance report of the PCF submitted to TE Connectivity. The assurance report shall verify the primary data, the LCA calculation methodology, the life-cycle inventory. TE Connectivity requires its supplier to present an assurance plan unless they have an assurance report. If the calculations are not verified by a third-party, supplier must provide the calculation formulas, the life-cycle model, the assumptions, and the scientific evidence of bespoke emission factors.

Assurance and verification of LCA studies and PCF calculations are mandatory for preferred and strategic suppliers per TE policy TEC-407-712: Business Classification of Suppliers. A PCF value and its supporting document must be verified by an accredited third party no later than 2 years after its first release. A limited assurance report of the primary data and the calculation method is desirable. TE Connectivity reserves the right to engage suppliers to provide the data in accordance with this policy.

A summary of technical requirements is given below in Table 1.

Suppliers in a specific industry value chain are recommended to follow the best practice in their respective industry. For example, TE Connectivity recommends suppliers to follow industry-specific guidelines; such as, [together for sustainability \(TfS\) platform](#), and [Catena-X, Recycled Content of Semi-finished Products](#) by Wieland Group, respectively, for the chemical industry, the manufacturing, and metals industry. For all other industries, TE Connectivity recommends to follow the principles of [WBSCD The Partnership for Carbon Transparency \(PACT\)'s Pathfinder Framework](#).

## 4. ACCOUNTING FOR BIOGENIC EMISSIONS

TE Connectivity encourages its suppliers to use sustainable raw materials in their feedstock. The WRI GHG Protocol Product Standard accounts for biogenic CO<sub>2</sub> as neutral, meaning the emissions from biogenic carbon are cyclic and in a circular flow in the biosphere. Thus, they do not contribute to climate change as they are not considered fossil based. The carbon uptake during the early life cycle phase is balanced with the carbon dioxide emissions into the atmosphere in the end of life (EoL) phase.

TE Connectivity requires the calculation of the removal of biogenic Carbon and requests a separate emissions calculation. Biogenic removals from CO<sub>2</sub> uptake during biomass growth shall

be included in the PCF calculation. Suppliers that use biogenic carbon removals in their raw materials and processes within their value chain must report those emissions separately and document the source of the primary data in their PCF report submitted to TE.

Table 1: List of required data and parameters

| Parameter                         | Data type                                          | Requirement                                                         |
|-----------------------------------|----------------------------------------------------|---------------------------------------------------------------------|
| <b>Material properties</b>        | Total product carbon footprint (PCF) and breakdown | Mandatory                                                           |
|                                   | Weight of the material                             | Mandatory                                                           |
|                                   | Material composition                               | Mandatory                                                           |
|                                   | Product model and description                      | Mandatory                                                           |
|                                   | Dimensions                                         | Preferred                                                           |
|                                   | Bill of materials                                  | Preferred                                                           |
|                                   | Time-related scope                                 | Mandatory, annual update preferred                                  |
| <b>LCA Model elements</b>         | Functional unit                                    | Mandatory                                                           |
|                                   | Data type                                          | Primary or third-party data <sup>5</sup>                            |
|                                   | System boundaries                                  | Mandatory                                                           |
|                                   | Regional scope                                     | Preferred                                                           |
|                                   | Validation of LCA model                            | Not mandatory, but encouraged                                       |
|                                   | Validation of bespoke emission factors             | Preferred                                                           |
| <b>Assurance and verification</b> | Assurance of the primary data                      | Mandatory maximum two years after the release of first PCF document |
|                                   | Verification of the calculation methodology        | Mandatory                                                           |
|                                   | Validation of life cycle inventory                 | Preferred unless it is up-to-date commercial database               |

## 5. TRANSITION PERIOD

TE Connectivity recognizes a transition period in conducting activities to complete PCF calculations. Suppliers shall complete their PCF studies and verify their data and methodology to the best of their knowledge and ability. Incomplete or inconsistent data, and non-standardized calculation methodology shall be justified. TE supports an open data and knowledge sharing platform across its value chain. Supplier sustainability can only be achieved through a collaborative effort across the value chain. TE expects guidance materials to be developed and

<sup>5</sup> Secondary data is defined as data that is not directly collected, measured, or estimated, but rather sourced from a third-party life-cycle-inventory database secondary data sources must be given in detail. TE Connectivity's recommended data sources are listed in in ANNEX I.

cooperation with stakeholders representing small-to-medium-sized (SME) enterprises will be strengthened in the near mid-term future.

## **6. DATA QUALITY, ASSUMPTIONS, AND LIMITATIONS**

Data quality from suppliers' operation must be given, such as, data used to model the PCF; e.g. direct emissions (scope 1), energy indirect; i.e. electricity-purchase (scope 2), upstream raw materials purchases (Scope 3 category 1), and if applicable downstream Scope 3 emissions, must be evaluated. TE recommends assigning data quality scoring of low, medium and high, to each data source. All assumptions must be documented and justified and given along with the PCF report. Limitations of the model must be given and, if necessary, justified.

## **7. VALIDITY**

PCF must be updated on annually or bi-annually to include data, not older than the most recent three calendar years. The submitted PCF shall be outdated after two years past its modeling date. The secondary data referenced shall be not older than five years. Supplier must include an improvement plan with the documents they submitted to TE, if they fail to meet one or more of the technical requirements of this policy. Supplier must submit a revision of its values and the supporting documentation on a regular basis, ideally annually. Any change to the PCF values must be reported to TE Connectivity.

TE Connectivity supports its suppliers to improve their sustainability profile. Achieving sustainability is the joint accountability of TE and its business partners. In that context, TE offers several training programs and recommends resources to its suppliers in order to help them decrease their operational and product-related emissions. All suppliers are encouraged to contact and engage with TE regarding sustainability.

**ANNEX I: List of public and commercial life cycle inventory (LCI) databases**

| Secondary data source                                                                                   | Type of emission factor                                                                | Version                             | Weblink                                                                      |
|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------|
| <b>Freeware</b>                                                                                         |                                                                                        |                                     |                                                                              |
| Plastics Europe LCI database                                                                            | Resins and plastics raw material emission factors                                      | 2022 and 2023                       | <a href="#">Plastic Europe Public LCI Database</a>                           |
| Life Cycle Assessment of Alternative Feedstocks for Plastics Production                                 | Bio-based products in resin production                                                 | Version 2019                        | <a href="#">European Platform on LCA (EPLCA)</a>                             |
| CBAM default values                                                                                     | Estimations on embedded emissions in iron and steel, aluminum                          | v.1.0                               | <a href="#">Default values transitional period</a>                           |
| exiobase                                                                                                | All raw material production, Multi-Regional Environmentally Extended Supply-Use        | v. 3.8.2 or later                   | <a href="https://www.exiobase.eu/">https://www.exiobase.eu/</a>              |
| European reference Life Cycle Database (ELCD) of the Joint Research Center (JRC)                        | Generic open database                                                                  | Various, depending on the dataset   | <a href="#">ELCD database</a>                                                |
| IPCC Guidelines for National Greenhouse Gas Inventories: Volume 3: Industrial Processes and Product Use | CO <sub>2</sub> emissions from metals industrial processes                             | Chapter 4: Metal industry Emissions | <a href="#">IPCC Guidelines Volume 3: Industry Processes and Product Use</a> |
| <b>Commercial</b>                                                                                       |                                                                                        |                                     |                                                                              |
| Ecoinvent                                                                                               | Generic commercial database, emission factors of raw materials and semi-finished goods | v. 3.6 or later                     | <a href="https://ecoinvent.org/">https://ecoinvent.org/</a>                  |