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PRODUCT CARBON INITIATIVE UNDERSTANDING THE FORMATS — of Product Environmental Data —

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ABOUT BEAMA 2050 Connected

BEAMA 2050 Connected is a not-for-profit subscription designed to unite the energy and built environment around the goal of supply chain and business decarbonisation by 2050 and promoting a circular economy. Collaboration through BEAMA 2050 Connected offers subscribers a range of benefits, with subscribing companies gaining access to a wealth of resource and opportunities to navigate the complexities of sustainability in a supported, aligned and consistent way.

For more information:

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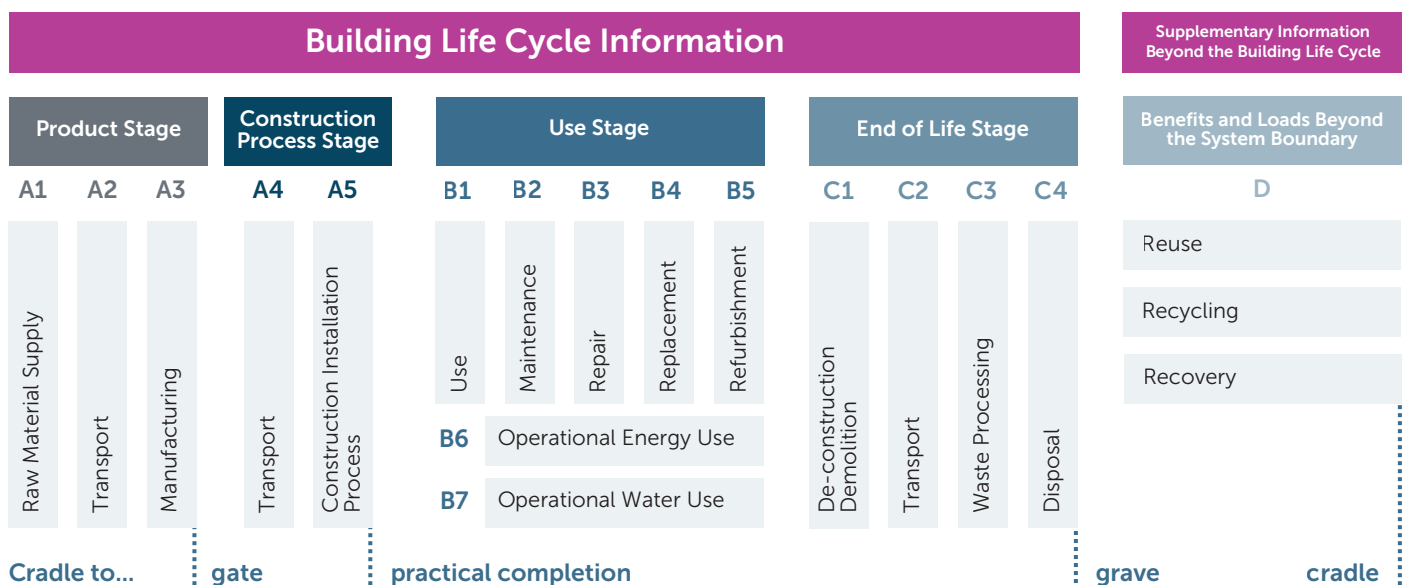


Understanding the Formats of Product Environmental Data

There are a range of approaches used to calculate, communicate and share product environmental information. These are often underpinned by life cycle assessment (LCA) principles. However, they vary in scope, purpose and how results are communicated. The following sections outline the most commonly used approaches.

Product embodied carbon, also known as upfront carbon or cradle to gate, is categorised by BEAMA members as stages A1 – A3 within a life cycle assessment. These are the stages where product information can be uniformly provided by manufacturers, unaffected by project-specific details.

Building Assessment information



EPD (Environmental Product Declaration)

An Environmental Product Declaration (EPD) is a standardised and verified document that communicates the environmental impacts of a product.

EPDs are a Type III Environmental Declaration. This means that they are 3rd party verified in line with ISO 14025, to support consistency and reliability of reports.

EPDs are based on life cycle assessment (LCA), allowing the full impact of the product to be reported from 'cradle to gate', 'cradle to grave', or 'cradle to cradle' depending on the assessment boundary.

EPDs can be developed for a wide range of products across various industries, including building materials, consumer products, food & beverages; however, there are very few EPDs for electrical, electronic and HVAC-R equipment. This is reflective of the fact that they are not always well suited to broad product families and complex assemblies.

An EPD can cover the following life cycle stages:

- Cradle to Gate: A1, A2, A3
- Cradle to Grave: A1, A2, A3, A4, B1-B7, C1-C4
- Cradle to Cradle: A1, A2, A3, A4, B1-B7, C1-C4, D



EPDs are usually product-specific and will include both a declared and functional unit. There is no requirement to provide other types of environmental declarations if there is an EPD available to cover the product. EPDs can support competitive differentiation and enhance brand reputation by allowing for transparent reporting of environmental impacts.



Benefits

Provision of relevant and reliable data on the environmental impacts of equipment throughout its life cycle.

3rd party verification to provide additional assurance where required.

Leverage competitive advantage by assessing and communicating environmental performance of your products.

Improvement of environmental performance: the underlying assessment offers insight into areas of improvement which can help reduction strategies.

Support compliance with future regulatory requirements for environmental metrics or environmental product labelling.

Challenges

EPDs are not well-suited to very broad product families and complex assemblies and supply chains.

The amount of information displayed in a published EPD can be extensive, with some EPDs running in excess of 50 pages.

Display of information can be problematic as there is no universal reporting template, which can hinder comparison and user understanding.

Cost and time to produce and deliver EPDs can be intensive.

In some cases, a full LCA and EPD is not needed to fulfil the request.





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PEP (Product Environmental Profile)

A Product Environmental Profile (PEP) is a type of Environmental Product Declaration (EPD), providing independently verified, lifecycle-based information on the environmental performance of electrical, electronic and HVAC-R products used in the built environment.

PEPs are specifically designed to integrate into building-level life-cycle assessments, allowing designers and specifiers to account for the environmental impact of MEP and electrical systems alongside traditional construction products when calculating whole-life carbon. PEPs also include information relating to reuse, recovery and/or recycling; however, the inclusion of this information is optional. PEPs are considered as Type III Environmental Declarations. This means that they are 3rd party verified in compliance with the ISO 14025 standard, to ensure both consistency and reliability.

Generally, a PEP will be requested to answer questions regarding embodied carbon but can cover more life cycle stages than just A1-A3. A PEP is valid for five years, and is managed by the programme operator PEP Ecopassport®.

Where a PEP is available, it is typically sufficient to meet requests for a Type III environmental declaration for electrical and HVAC-R products, as it is developed using a verified LCA methodology aligned with ISO 14025 and sector-specific Product Category Rules (PCR). These PCRs define consistent assumptions, system boundaries, functional units and indicators for specific types of products. This ensures environmental data is calculated and presented consistently across similar equipment.

A PEP is divided into the following mandatory stages:

A1, A2, A3, A4, A5, B1-B7, C1-C4, D.

A fuller description of PEPs and their scope can be found here: <https://pep-ecopassport.org/en/what-is-a-pep/>



Benefits

Provision of relevant and reliable data on the environmental impacts of the equipment throughout its life cycle.

3rd party verified process, based on transparent and scientifically validated methods to help clients choose between products.

Leverage Competitive Advantage by assessing and communicating the environmental performance of your products, which can help to enhance brand reputation and customer loyalty.

Improvement of Environmental Performance offers insight into 'problem areas' which can help target strategies to optimise resource use and minimise waste and energy generation.

Support compliance with upcoming regulatory requirements for environmental declarations or environmental product labelling.

Supply Chain Management can encourage the demand for products with lesser impact on the environment.

Challenges

The number of PEPs needs to grow considerably to achieve environmental goals.

Display of information can be problematical as there is no universal reporting template which can hinder comparison exercises.

Cost and time to implement PEPs within an organisation can be problematical.

Raising awareness of the value of PEPs and their position against other environmental declarations.





TM65 Assessments

CIBSE TM65 is a methodology offering basic or mid-level calculations designed to aid consultants, researchers, and manufacturers in evaluating the embodied carbon of building services equipment when an Environmental Product Declaration (EPD) is not available.

TM65 assessments can be considered as a Type II environmental declaration, which is classed as a 'self-assessment' and is not 3rd party verified unless this option is chosen via CIBSE Certification.

As clearly indicated in the methodology text, TM65s should be requested when an EPD/PEP is not available. Where an EPD/PEP is available, the information required to establish the embodied carbon of MEP products should be taken from these assessments.

Through a combination of primary data, assumptions and multiplication factors, **TM65 Assessments aim to cover the following LCA stages:** A1, A2, A3, A4, A5, B1, B2, B3, C1, C2, C3, C4.

The TM65 methodology document considers embodied carbon at the individual product level.

The TM65 methodology states that LCA stages B4 & B5 are not included at product level.

A fuller description of the methodology and its scope can be found within the CIBSE document: [Embodied carbon in building services: a calculation methodology TM65: 2021](#)





Benefits for Manufacturers

Cost effective self assessment option.

Good stepping stone into LCA principles.

The digital tool (DT65) helps understand the calculation process.

Established methodology from an industry recognised body.

Standardised emissions factors.

Basic or mid-level calculation options.

Challenges for Manufacturers

Threshold difference between basic and mid-level calculations.

Methodology and calculations need to be updated in line with technology.

Different reporting boundary depending on level of calculation not aligned to BEAMA's adopted A1-A3 definition.

Benefits for Customers

Where an EPD is unavailable, TM65 allows for data to be provided.

Established methodology from an industry recognised body.

Can be reasonably compared to other TM65 assessments.

Challenges for Customers

Only for MEP Products.

Less accurate than a full LCA.

CIBSE need to maintain and update the methodology and calculation tool in line with emissions factor updates and technology development.

Not linked to Standards.





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Supporting Informed Understanding

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