EPD USAGE GUIDE

What is an EPD?

An Environmental Product Declaration (EPD) is a standardised report that provides transparent, and third-party verified information on the environmental impact of a product, over a selected set of life cycle stages.

In determining environmental performance of a building product or system in a building, an EPD is not a substitute for a Whole of Building Life Cycle Assessment (WBLCA). Individual building products may act in concert to deliver certain operational performance outcomes, such as ventilation and solar control interactions with the thermal mass of a structure to deliver passive heating and cooling.

EPDs are a useful tool for measuring the environmental impact of a particular building product in isolation, it may allow for comparisons between functionally equivalent products, for example, a brick vs. a brick or a kitchen tap vs. a kitchen tap.

An EPD is based on a set of internationally recognised standards and guidelines, and consists of multiple datasets that outline the consumption of energy, water, resources, and emissions to air, water, and soil. The data is combined using several environmental impact categories, including contributions to climate change, pollution of air, water, and soil, and resource depletion. Additional information such as product performance, environmental management systems, and other certifications may also be included. EPDs are typically developed by product manufacturers or suppliers, and can be used by consumers, architects, and other stakeholders to make more informed decisions about the environmental performance of the products they use or specify. In a world where sustainability claims can be unclear or misleading, EPDs offer transparency, assurance, and clarity on the environmental impacts of a product, although they cannot be used to compare different materials.

What rules govern the development of EPDs?

EPDs are governed by International and European standards, specifically ISOs 14025 and 14044, and EN 15804. These standards ensure consistency, transparency, and accuracy, making EPDs a reliable way to assess the environmental impacts of building materials. In Australia and New Zealand, EPD Australasia (https://epd-australasia.com/) provides businesses with a framework for independently verified, LCA-based environmental data and other information about their products and services, by registering and publishing Environmental Product Declarations (EPDs) and Climate Declarations.

Using EPDs as part of a Life Cycle Assessment (LCA)

The principle to follow when selecting building materials for Life Cycle Assessment (LCA) calculations is to always choose the most relevant option available. The selection should follow these steps:

1. Look for a product EPD from the manufacturer of the specific product you plan to use, if available (https://epd-australasia.com/epd-search/).

2. If you are uncertain which manufacturer to use, search for technically similar product EPDs from a local manufacturer.

3. Look for a product category level EPD.

4. As a last resort, use the average LCA data for the product in question.

If local EPDs are not available, materials with the same technical features as the ones you are planning to use can be used for calculations, as their environmental impacts may be roughly the same. This can be used to calculate Whole Building LCA (WBLCA).

Beware of the limitations of using EPDs

While EPDs offer a valuable tool for building and design projects, there are limitations to their use.

EPDs should only be used to compare products within the same product group and with the same lifecycle scenarios. It is crucial to ensure that the system boundary applied to the products being compared is identical.

Also, the end-of-life scenario chosen by the manufacturer can significantly impact the final outcome of the life cycle assessment. If a recycling scenario is included in the EPD, it is essential to verify that the recycling system is in place and functioning.

You should check that:

- The EPD is third-party verified.
- The described assumptions match the actual use of the product.
- That the EPD is not focused solely on greenhouse gases, but also considers other relevant impact categories.

EPDs provide data, but do not rate products or imply that a declared product is environmentally better than another product. Material selection based on EPDs can be limiting since it only considers a specific product within a certain material category, which may not necessarily be the best product overall. A holistic approach is needed by considering options across all relevant product categories to make the best system choice.

Even under a single Product Category Rule (PCR), the rules and background reference data may change over time. Thus, EPDs must be dated and revalidated regularly to ensure an accurate "apples-to-apples" comparison.

How to compare different materials or product types?

EPDs created using different PCRs cannot be compared, however whole life LCAs, also known as cradle-to-grave LCAs, may be useful. EPDs are based on product-level LCAs, which typically only cover the cradle-to-gate stage. This means they only account for the portion of the life cycle from raw material extraction to the end of product manufacturing, including Modules A1-A3 (EN 15804 Environmental Product Declaration). However, commercially available LCA tools encompass all stages of the life cycle, starting with the Production Stage, followed by the Construction Stage (Modules A4-A5) and Use Stage (Modules B1-B7), and concluding with the End-of-Life Stage (Modules C1-C4).

Incorporating EPD product data into an LCA tool requires a significant amount of effort for data harmonisation. Tool developers must examine all the background data used to create the EPD and make adjustments to ensure that consistent data is used across a broad range of product types. For instance, data from different sources may be used to determine the environmental impacts of diesel-powered trucks that transport raw materials from the extraction site to the manufacturer, resulting in EPDs that are based on different sets of data. To ensure the comparability of these two data points, the tool developers' responsibility is to harmonise these discrepancies. This behind-the-scenes work makes it possible to accurately compare different products and systems within these tools. Comparing EPD data outside these tools is unlikely to be appropriate. Furthermore, the use of consistent data enables tool developers to apply it to the life cycle stages excluded from EPDs.

EPDs are most commonly used as part of an iterative LCA process. While LCA is a powerful way to measure environmental impact, it is merely a measure in the end. To fully unlock the potential of LCA, it should be conducted iteratively in conjunction with the progression of design, rather than as a post-mortem analysis after all decisions have been made. At the opportunity and origination stage, a preliminary LCA should be conducted to inform the development brief and establish ambitious yet achievable goals for the project. As major decisions about the building's structure, layout, and envelope are made during the early concept design stage, fast and agile LCAs should be conducted. At this stage, a reduction roadmap should be created to demonstrate how the project will achieve its embodied carbon target.

EPDs can be used to inform potential reduction scenarios and suggest low embodied carbon products at this point. During the tender and procurement phase, all suppliers for key works packages that have been identified are required to provide EPDs as part of the specification and tender process. These EPDs are then assessed using an existing LCA, and products that assist or impede the embodied carbon target are compared. When different suppliers provide solutions that satisfy the same or similar price points, logistic capability, and performance criteria, sustainability can be an important differentiator. A preferred product from a sustainability perspective is identified and communicated, and it is then overlaid with other project criteria. Lastly, as procurement decisions are finalised and detailed design is reached, a comprehensive LCA is conducted, and EPDs are collected for rating tool submission.

Why are EPDs important, if not for comparing products?

The building industry relies on EPDs and their associated LCAs for valuable information in various ways. Firstly, they form the basis for many products in LCA tools, which are used for holistic building system comparisons like Whole of Life Whole of Building LCA. Secondly, they offer transparent data on material extraction and manufacturing practices, enabling identification of potential areas for improvement. Manufacturers can participate in the green building economy by voluntarily reporting the environmental benefits and impacts of their products.

When selecting products during the procurement phase, EPDs are most useful for comparing available products that meet project specifications (e.g., concrete for spread footings). Additionally, EPDs are useful for validating WBLCA data to ensure embodied carbon savings anticipated in design are realised during construction.

While EPDs are a crucial tool for achieving a lower embodied carbon future, designers must understand their appropriate use and limitations for direct comparison. By leveraging EPD data along with a cradle-to-grave WBLCA approach, designers can have a significant impact on the embodied carbon footprint of the built environment.