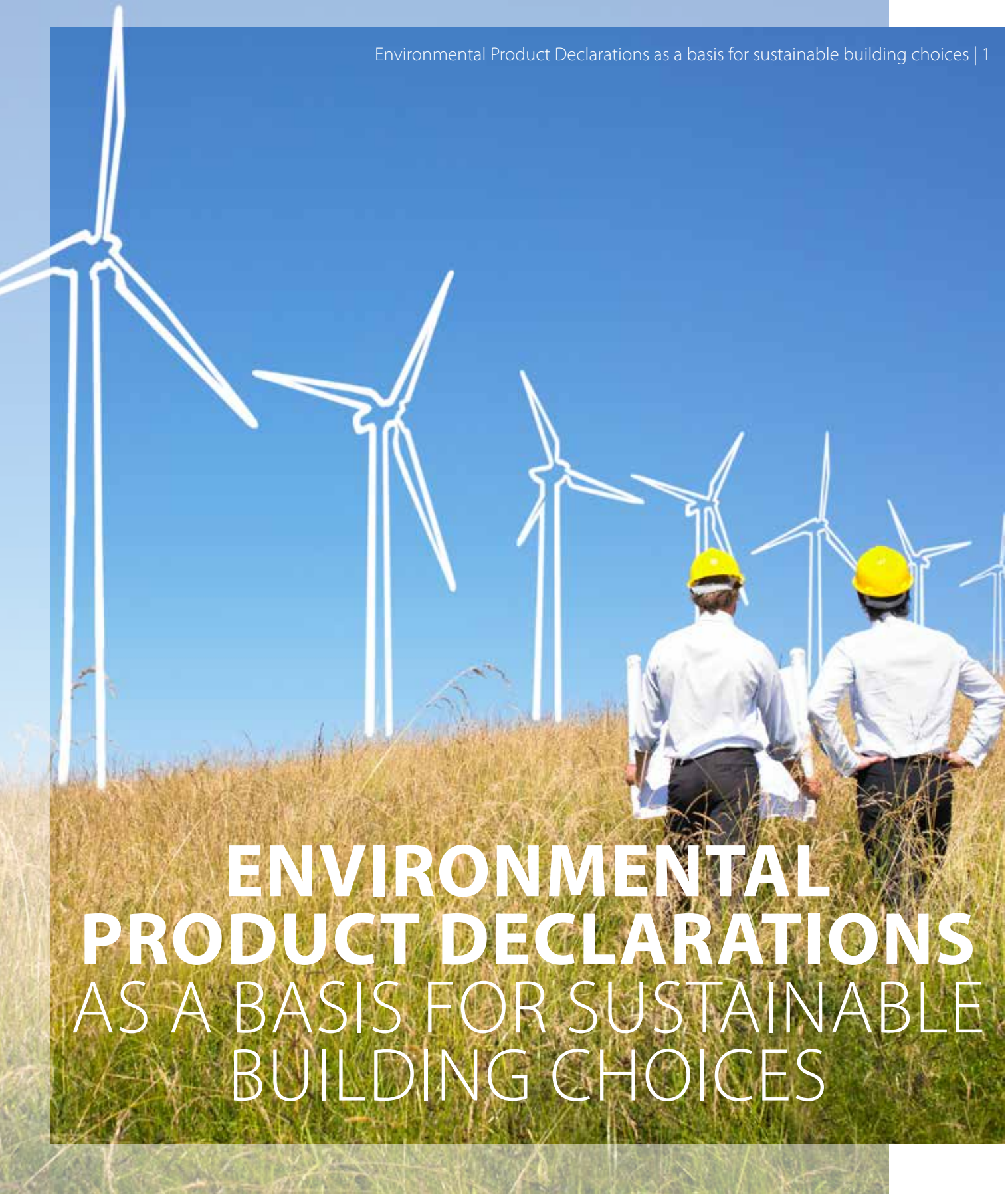


ENVIRONMENTAL PRODUCT DECLARATIONS AS A BASIS FOR SUSTAINABLE BUILDING CHOICES

Buildings
are responsible for 39% of all carbon emissions in the world[1]

SUSTAINABLE BUILDING CHOICES

FACT

The sector has a crucial role to play in ameliorating the current state of the environment

With buildings responsible for 39% of all carbon emissions in the world[1], the sector has a crucial role to play in ameliorating the current state of the environment.

Much progress has already been made through energy-saving innovations such as LED lights and solar panels. But for change to happen on the scale that is necessary, the industry must look further: to a building's intrinsic circular value. It must examine and account for the choices in materials and resources it makes, and the environmental impact those choices have.

This whitepaper discusses the value of environmental product declarations in facilitating decision-making for sustainable building design.

[1] World Green Building Council, 2019

Bringing Embodied Carbon Upfront, p.7,

https://www.worldgbc.org/embodied-carbon

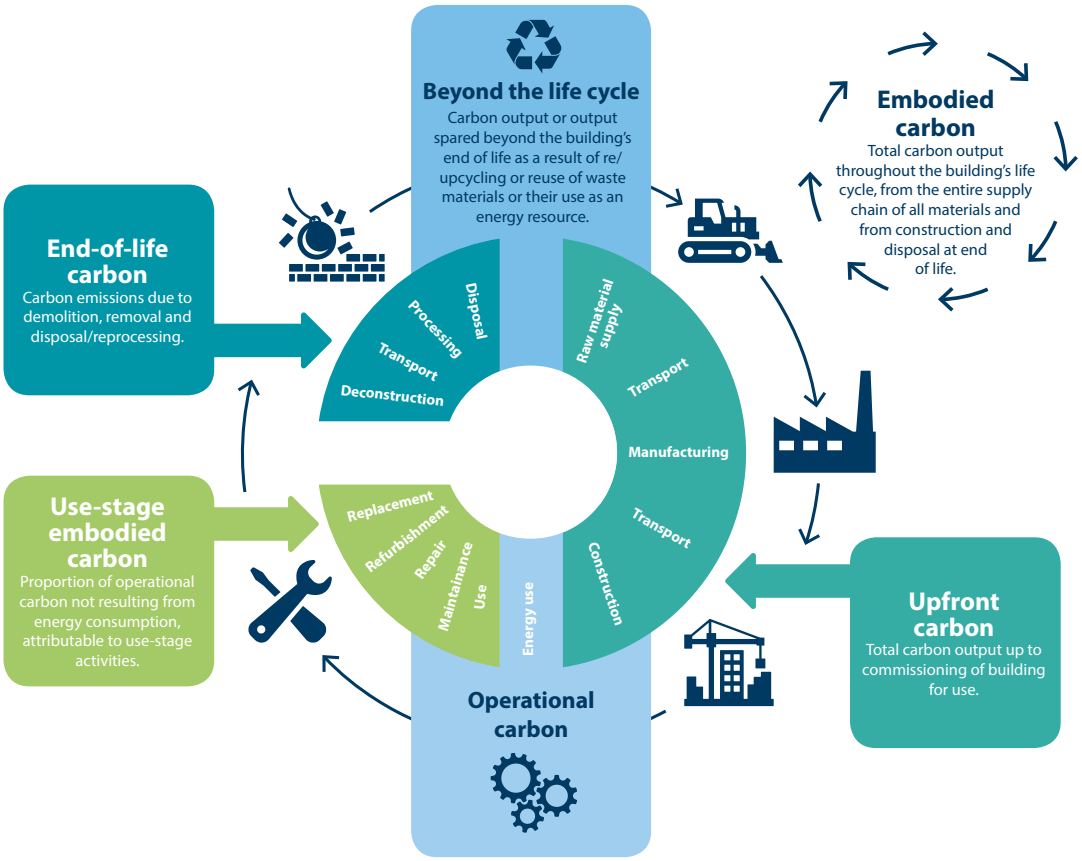
EMBODIED CARBON

FACT

CO_2 emissions attributable to buildings come from two main sources: operating emissions and embodied emissions.

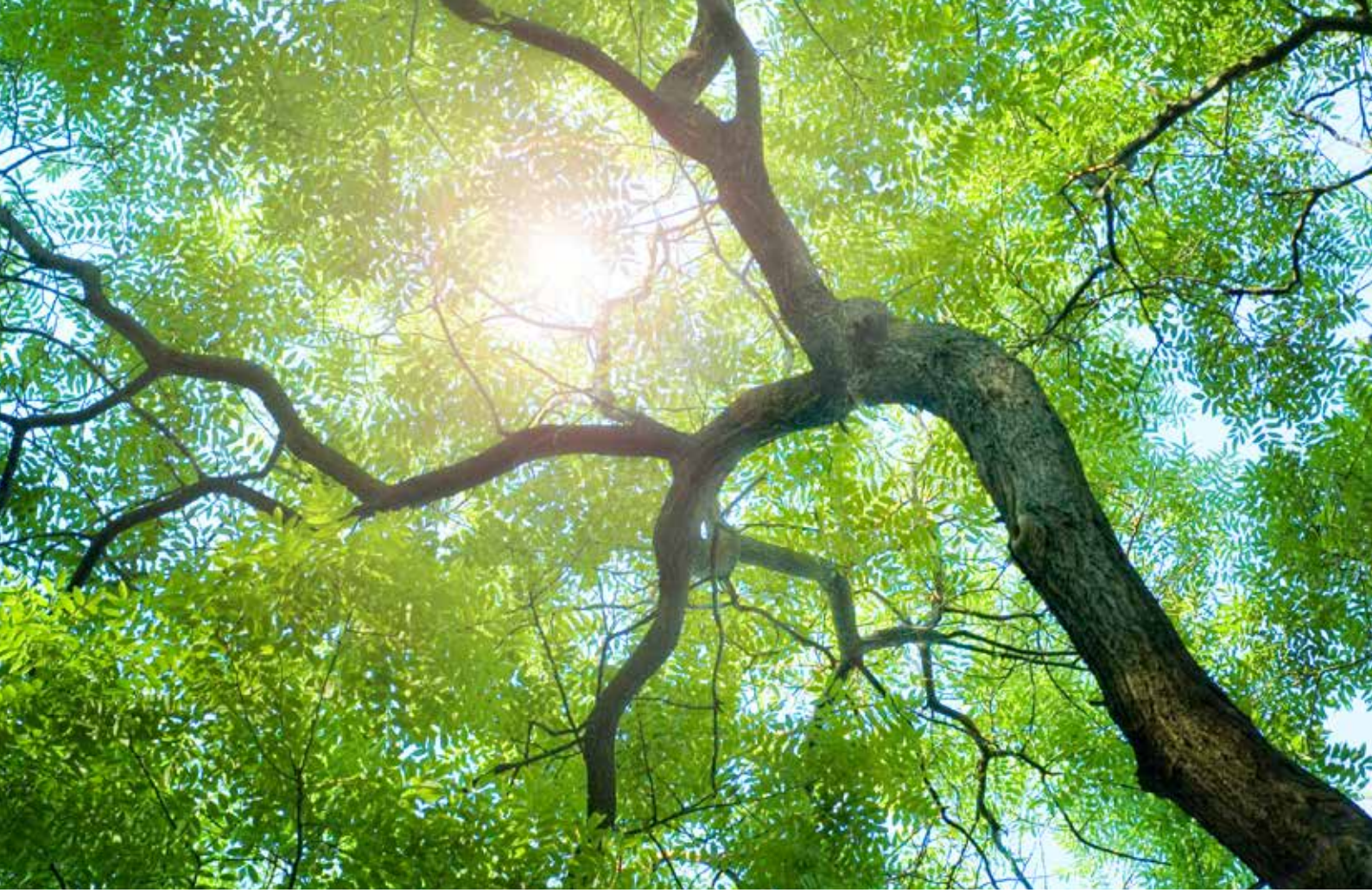
CO_2 emissions attributable to buildings come from two main sources: operating emissions (emissions resulting from energy required to keep a building up and running) and upfront or embodied emissions: these represent total carbon output throughout the building's life cycle, including carbon emissions involved in the entire supply chain of all the building's materials – internal and external – as well as emissions created during the building's construction and disposal at end-of-life.

Whilst the impact of operating emissions has been an area of focus within the building sector for some time, embodied and upfront carbon still requires much thought and attention. In an effort to highlight the significance of these emissions and ultimately, increase the likelihood of the targets set out in the Paris Agreement being met, the WorldGBC has set out a vision for new buildings, infrastructure and renovations to have net zero embodied carbon by 2050.[2]



Source: World Green Building Council

[2] World Green Building Council, 2019 *Bringing Embodied Carbon Upfront*, p.8, https://www.worldgbc.org/embodied-carbon



THE ROLE OF SUSTAINABLE CERTIFICATES AND DECLARATIONS

Clearly, in order to build greener buildings, the industry needs greener products and materials with which to build them.

Product declarations and certificates of environmental performance offer an agreed standard by which to evaluate the environmental performance of a given product. The results can then be used by other stakeholders – such as architects or designers – as a benchmark for comparing the environmental credentials of one product over another. Standards for environmentally friendly labels provide 'internationally agreed and harmonized criteria and methods of labelling to provide a credible and level playing field'.[3] The ISO distinguishes three types of environmental product standards:

- Type I: environmental labelling for eco-labelling schemes where there are clearly defined criteria for products;
- Type II: self-declared environmental claims for products and services where there are neither criteria nor labelling schemes;
- Type III: environmental declarations for specific aspects of products using a life-cycle approach.[4]

[3] ISO, *Environmental labels*, p.2, https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100323.pdf

[4] ISO, *Environmental labels*, p.4, https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100323.pdf

Type III – ISO14025 – considers the environmental impact of a product throughout its life cycle and not just during its use phase (for example, the operational phase of a building). This category also requires third-party verification that the standard has been met.

This third category includes Environmental Product Declarations, or EPDs. An EPD presents quantified environmental data for a product, based on information from what's known as a life cycle assessment, or LCA. The LCA methodology is in turn governed by ISO14040:2006 (Environmental management – Life cycle assessment – Principles and framework) and ISO 14044:2006 (Environmental management – Life cycle assessment – Requirements and guidelines). EPDs are defined by EN15804 and ISO14025.

The EPD is commissioned voluntarily by the manufacturer of a product for the purpose of providing easily accessible, quality-assured and comparable information regarding the environmental performance of a product. Valid for a period of five years, the EPD is a living document; if process changes are made during this period, a review is conducted.

EPD EXPLAINED

FACT

An EPD sheet consists of three main elements

In concrete terms, an **EPD sheet** consists of three main elements:

1. Declaration of general information
2. Declaration of environmental parameters derived from LCA
3. Scenarios and additional technical information

Of these, the second part is the most interesting and represents the core of the EPD. This is the section that effectively measures environmental performance. The way it does this is through performing a life cycle assessment (LCA).

CALCULATING ENVIRONMENTAL PERFORMANCE - LCA EXPLAINED

The LCA is the methodology that is used for measuring – quantifying – the environmental performance. This **LCA methodology** again consists of three main parts:

1. **Goal and scope**
2. **Inventory analysis**
3. **Impact assessment**

The goal and scope **(1)** is important, because, among other things, it sets out exactly which processes in a product's life are being assessed, and which are not. There are, in fact, a few variants on LCA, namely Cradle-to-Gate and Cradle-to-Grave. Each of these follows the product increasingly further along the cycle, as outlined in Figure 1 below:

Data collected for the LCA during the inventory analysis **(2)** is governed by a set of Product Category Rules (PCR). These set out what data should be collected and how, which calculations should be performed to produce evidence of climate impact, and how this information should be presented.

Put very simply, the inputs and outputs involved in the processes being assessed are combined to indicate the potential the product has for harming the environment **(3)**. These impacts are categorised into seven types: global warming potential, ozone depletion potential, acidification potential, eutrophication potential, photochemical ozone creation potential, abiotic depletion potential (elements) and abiotic depletion potential (fossil).

The above seven categories are a compulsory part of the inventory analysis, but some manufacturers may also volunteer information on further categories here, such as ecotoxicity and human toxicity.

In the case of a flooring product, for instance, EPD values would be expressed per 1m^2 of flooring.

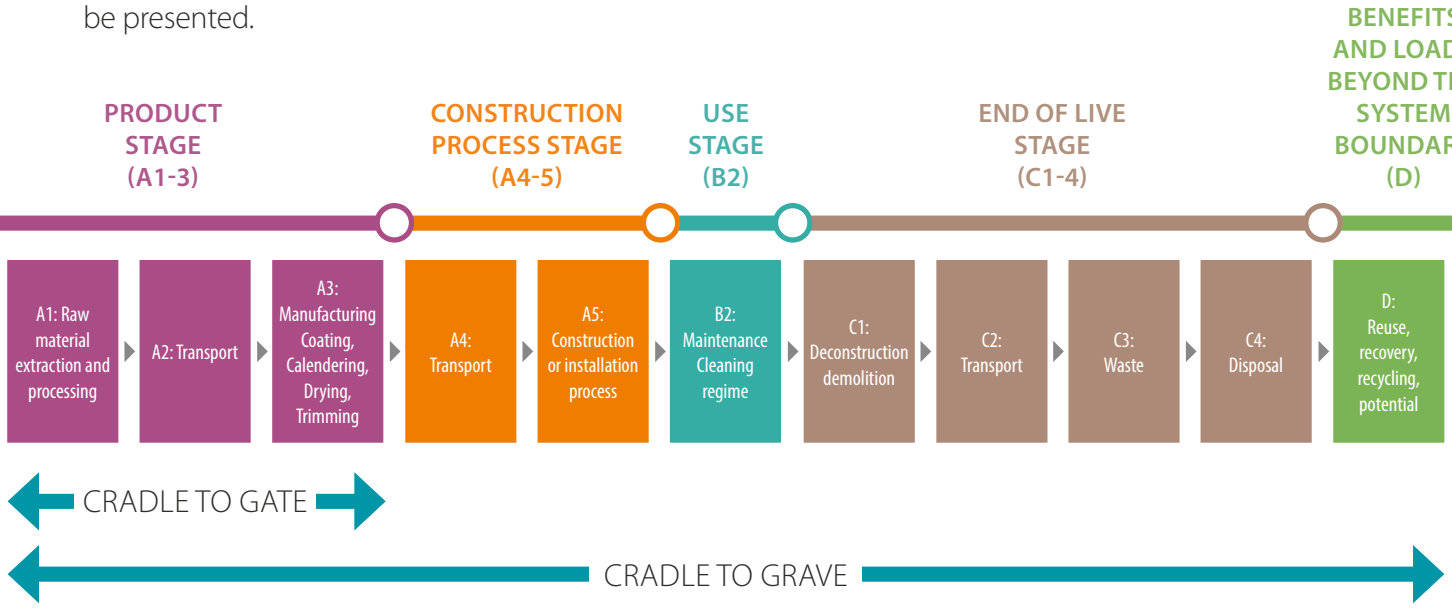


Figure 1: flowchart of a LCA

WHY AND HOW TO USE AN EPD

FACT

An EPD has a knock-on effect all along the value chain

In the endeavour to achieve net zero buildings in a matter of decades, the WorldGBC 'strongly encourages entities to plan, monitor and report embodied carbon emissions as they become proportionately more significant'.[5]

Environmental product declarations thus represent an invaluable tool for tracking CO_2 associated with specific products and materials, which will in turn impact the carbon footprint of a particular building.

Furthermore, Green Building Councils and certifications, such as LEED and BREEAM, are increasingly asking for or rewarding environmental declarations on products, as they offer a means of calculating the footprint of a building. Furthermore, such product declarations are now being required by law, and are often specified in tendering processes. It is even the case that EPDs are often the passport of a building which helps to identify the materials and its cirulairity in a later stage when renovation or demolition is taking place.

But an EPD has a knock-on effect all along the value chain: architects and planners, for instance, can incorporate a product's EPD into the overall LCA of a building project; real estate companies and building owners can allocate a higher value to green investments and properties; properties that are certified as sustainable can be marketed as such; retailers and consumers can refer to EPDs as reliable proof that backs up a product's environmental claims, and so on.

[5] World Green Building Council, *The net zero carbon buildings commitment,* https://www.worldgbc.org/thecommitment

CONCLUSION

FACT

An EPD provides a framework for measuring the environmental footprint of a building

With global building stock expected to double by 2060[6], the sector needs to make a serious commitment to climate action by drastically reducing both operational and upfront and embodied emissions from buildings.

This will require a much more circular approach to building design, construction and disposal, with attention to inputs, outputs and processes involved in a building's lifespan – from cradle to end-of-life – and their respective impacts on the environment.

Quantitative and credible data in the form of standardised environmental product declarations (EPDs) provide a framework for measuring the environmental footprint of a building, by declaring third-party verified data on the environmental performance of a product. EPDs can be used by stakeholders along the supply chain to compare environmental credentials of products and materials and make informed, sustainable decisions that will translate environmental performance into true value and benefit for the global ecosystem.

[6] World Green Building Council, *New report: the building and construction sector can reach net zero carbon emissions by 2050,* https://www.worldgbc.org/news-media/WorldGBC-embodied-carbon-report-published

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