



ENVIRONMENTAL PRODUCT DECLARATIONS (EPDS)

What are they and what do they mean?

Environmental Product Declarations (EPDs) allow manufacturers to disclose a product's carbon footprint and other impacts. Like nutritional labels, EPDs strive to summarize ingredients that are difficult to quantify. Though intended to promote material transparency, EPDs are complex documents that can be anything but clear to most architects and other building professionals.

Pictured: Former CalPortland sand and gravel quarry reclaimed into Chambers Bay Golf Course, Puget Sound, WA.



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What is an EPD?

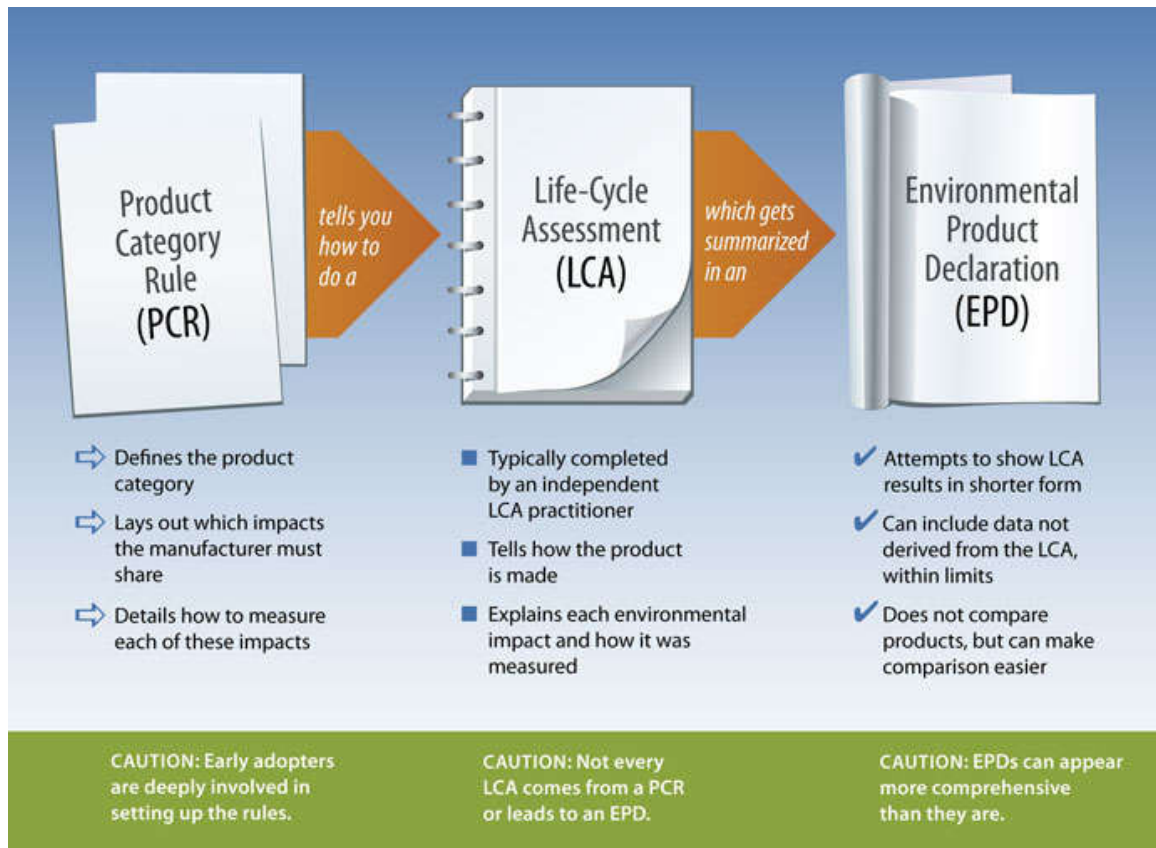


An EPD is a verified and registered document that communicates the life-cycle assessment (LCA) of a product based on the product category rules (PCR). A PCR is the fundamental document that establishes the rules governing the assumptions and calculations performed in an LCA which are ultimately expressed as an EPD. PCR/EPDs must be consistent with the International Organization for Standardization (ISO) standards such as ISO 14025, 14040, 14044, EN 15804 or ISO 21930. These standards address how to perform an LCA, what data to include and how to compile that data into an EPD. Following is a breakdown of all the necessary components that contribute towards creating an EPD.

An EPD consists of life-cycle assessment information summarized and repackaged into a shorter, more accessible document.

As defined by the International Organization of Standardization (ISO), an EPD is formally known as a “Type III Environmental Product Declaration.”

ISO stands for the International Organization for Standardization. ISO promotes the development and implementation of voluntary international standards, both for particular products and for environmental management (EMS) issues. ISO 14000 refers to a series of voluntary standards developed by ISO. Included in the ISO 14000 series are standards for environmental management systems (EMS) environmental auditing, environmental performance evaluation, environmental labeling, and life-cycle assessment.



Source: The DNA of EPDs: The Making of Product Category Rules | BuildingGreen

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What is life-cycle assessment?



Life-cycle assessment, or LCA, is **the science of quantifying environmental impacts through the entire process of creating, transporting, using, and disposing of a product or material**. Environmental impacts assessed include things like embodied carbon, smog-creation potential, and fossil fuel consumption.

LCAs are extensive, detailed assessments that cover a product's life cycle, typically in one of two ways:

- *cradle to gate*—starts with resource extraction and ends when the delivery truck is about to leave the factory. LCA is commonly defined as cradle to gate in Type III/concrete EPDs.
- or *cradle to grave*—starts with resource extraction and ends at the landfill or recycling plant. Cradle to grave LCA's are the most comprehensive exploring the impacts over the entire existence of a material.

(Cradle to cradle—starts with resource extraction and ends with safe and potentially infinite circulation. There is no waste.)



Source: Sustainability | Saint Gobain Gyproc (saint-gobain-gyproc.com)


ISO standards 14040 and 14044 define how to conduct an LCA, though not all LCAs follow these standards. Even so, most LCAs do include:



- goal and scope
- functional unit—a clear definition of what is being studied
- life-cycle inventory (LCI)—a list of material and energy inputs, and any releases into the environment
- life-cycle impact assessment (LCIA)—review of LCI information, and determination and measurement of impact categories
- life-cycle interpretation—a review of the information, its limitations, and other factors

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What are the three types of environmental labels?



	 
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<p>Type II: Self-Declared Environmental Claims (ISO 14021)</p> <p>Claims are based on self-declarations by manufacturer, distributors, or retailers. Self-certification, not independently verified. Not necessarily based on LCA.</p>	 
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What are the three types of Type III EPD?



Type III EPD

- Product-Specific Declaration (Product-Specific EPDs are used for industries without established PCRs and aren't always verified by a 3rd party)
- Industry-Wide (Generic) EPD
- Product-Specific Type III EPD

Product-Specific Declaration

This EPD is calculated as $\frac{1}{4}$ of a product.



Product-Specific EPDs are used for industries without established PCRs and aren't always verified by a third party

Without PCR reference, this EPD is in accordance with ISO 14044

Industry-Wide (Generic) EPDs

This EPD is calculated as $\frac{1}{2}$ of a product.



Covers a broad product type such as ceramic tile, cement or MDF
Manufacturer must be called out as a participant on the EPD

Must state preference PCR
PCR review (third-party entity has reviewed the product category rules)

Industry-Wide EPDs must reference all ISO Standards – 14025, 14040, 14044, EN 15804, or ISO 21930

Along with the PCR review, the entire EPD must be verified (usually by the program operator)

Product-Specific Type III EPDs

This EPD is calculated as a whole product.



Most common type of EPD
Covers a single product from a manufacturer

Must state referenced PCR
PCR review (third-party entity has reviewed the product category rules)

Type III EPDs must reference all ISO Standards – 14025, 14040, 14044, EN 15804, or ISO 21930

Along with the PCR review, the entire EPD must be verified (usually by the program operator)

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What information is included in an EPD?



Sometimes described as a “nutrition label for products,” an EPD provides:

- a list of basic materials and components
- a description of the manufacturing process
- the scope of the LCA
- a variety of environmental impact data

It may also include other relevant but optional information, such as results of VOC emissions testing or achievement of third-party certification.

Can I find out about a product’s carbon footprint from an EPD?



Yes. An EPD summarizes the major ways the product affects the environment, called *impact categories*. Some of the most common environmental impact categories you’ll see on an EPD for a building product include:

- Global warming potential (GWP), roughly equivalent to embodied carbon in a cradle-to-gate EPD
- Photochemical ozone creation, which shows how the product contributes to smog
- Eutrophication, a measure of the product’s potential contribution to nutrient runoff damaging to aquatic ecosystems
- Acidification, a measure of the potential to cause harmful acidification of water bodies and soil
- Primary energy, the amount of energy used at each stage of the life cycle that’s covered
- Water consumption
- Non-renewable fuel consumption

If a product has an EPD, does that mean the product is green?



No. EPDs merely disclose information about a limited number of impacts. You need a lot more information to know whether a product is more sustainable than other options.

Beware of companies touting that they have “earned” an EPD or that it is an achievement in sustainability. An EPD is not a certification, and the meaning of the sustainability data therein is subject to interpretation. A company or trade association that has paid to complete an EPD is more likely to have a generous interpretation of it.

If an EPD is LEED v4 compliant, does that make it green?



No. It simply indicates that the EPD was created under specific rules. The inclusion of EPDs in LEED v4 is intended mainly to encourage companies to produce EPDs, not to indicate that products are green.

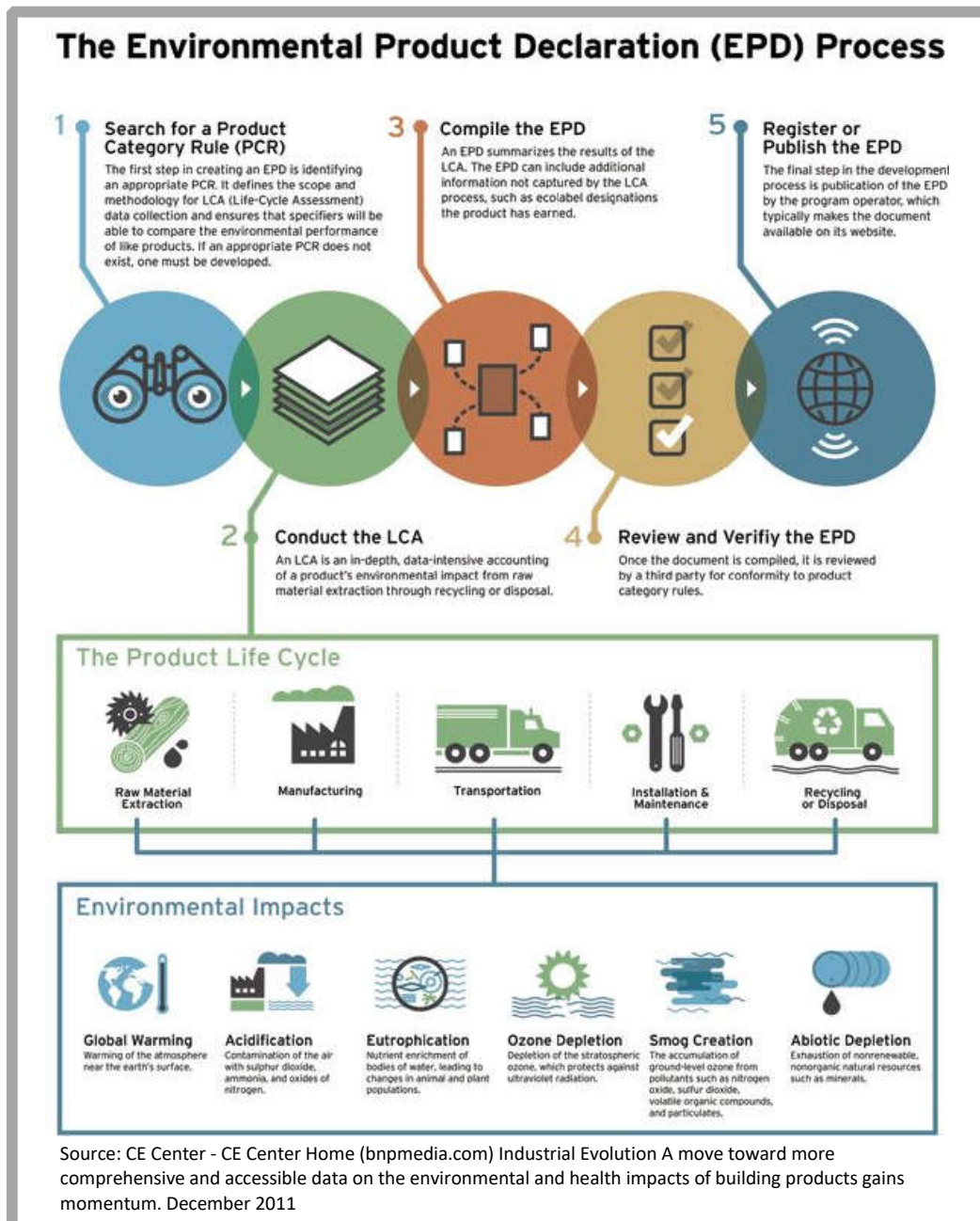
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How are EPDs created?



ISO technical standards govern the process of creating an EPD. These standards include rules for:

- Developing a product category rule, or PCR, which helps ensure all the products in the same category are measured using the same yardstick
- Conducting a life-cycle assessment, or LCA, that uses technically sound methodology, adheres to the PCR, and is verified as valid by a third party
- Writing an EPD that contains valid data, adheres to the PCR, and doesn't go overboard on marketing language



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Do all EPDs follow ISO rules?



When an EPD is created it is accordance with ISO 14025 and EN 15804 guidelines. They are developed based on life cycle assessments following *ISO 14040 (Environmental management - Life cycle assessment - Principles and framework)* and *ISO 14044 (Environmental management - Life cycle assessment - Requirements and guidelines)*, which describe the process for doing a life cycle assessment.

The *ISO 14025 (Environmental Labels and Declarations — Type III Environmental Declarations — Principles and Procedures)* establishes the principles and specifies the procedures needed to develop Type III environmental product declarations. These Type III declarations are the most rigorous since they have detailed rules and must be verified by a third party.

The European construction industry follows *EN 15804 (Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products)*. Like ISO 14025, this is a third-party Type III environmental declaration procedure. It is the most important standard in a group of six European standards related to the environment, defining how companies should go about creating EPDs.

Adherence to the ISO suite of LCA-related standards is a basic, entry-level marker of a quality EPD. It's also required in order for the product to contribute toward LEED.

The ISO standards, though far from perfect, help ensure that PCRs, LCAs, and EPDs are developed in a similar way by all manufacturers and are validated by third parties, making it harder to publish false claims that have the appearance of scientific validity. The standards are also regularly updated to improve their stringency.

Are EPDs scientific?



Yes and no. They are based on LCA, which is a valued scientific methodology used for decades by academics as well as by manufacturers wishing to examine and improve their own practices.

Although they include data from an LCA, it's important to understand that EPDs are transparency documents, intended for an external audience: customers.

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Who makes the product category rule?



Manufacturer trade groups are primarily responsible for creating product category rules, or PCRs. PCRs are developed in an open and collaborative manner. Stakeholders may include material suppliers, manufacturers, trade associations, purchasers, users, consumers, nongovernmental organizations, public agencies, life-cycle assessment practitioners and certification bodies.

EPDs follow ISO 14025-compliant PCRs that describe specific environmental impacts to be covered, and the requirements that need to be followed, to produce a product's LCA. PCRs can differ, but they should be the same for each product category so those EPDs can be compared.

Differences can still exist within product categories, however, such as between European and U.S. PCRs. That's because manufacturing or other conditions differ enough that using the same PCR wouldn't make sense.

What does a program operator do?



An ANSI-accredited program operator can determine whether an existing PCR should be used or adapted, or if a new rule has to be created. If the latter, the program operator oversees the group writing the new PCR.

The program operator also acts as a third party to certify the EPD process (that is, to certify that it's following protocol—not that the EPD itself indicates that the product is green). Program operators in North America currently include:

ASTM Intl., ICC Evaluation Service, IERE, NSF International, SCS Global Service, and UL Environment

Can I compare several EPDs and pick the product with the lowest impacts?



Not exactly. Based on the metaphor of the nutrition label for building products, EPDs are sometimes described as providing an “apples-to-apples” comparison, but they should not be used as a comparison tool between disparate products, such as wood and steel, or different types of concrete, because the LCA information upon which they are based is so different.

The main issue with EPDs in their current form is their lack of comparability. Concrete is especially difficult to compare EPD's since it can be designed for so many different functional attributes. “In the case of concrete, EPDs usually only list one performance metric: 28-day strength. Since concrete mixes are created to meet numerous performance metrics—such as stiffness, density, and constructability—it is inappropriate to compare them purely based on 28-day strength.” (CSHub MIT Topic Summary Dec. 2020 Adding Environmental Impacts into the Procurement of Building Products)

About CalPortland

For 130 years, CalPortland has demonstrated leadership by improving energy efficiency. We are the only industrial company to receive an ENERGY STAR® Partner of the YEAR Award from the U.S. EPA for the past 17 consecutive years. CalPortland leads the cement and concrete industry in our conservation efforts and the number of products we offer with EPDs.

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