Irish Building Control Institute 2024

One Click LCA

One Click LCA Presenters

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Agenda

Building LCA

- Climate Change & Embodied Carbon
- Building LCAs - What are they?
- The Driving Forces of Building LCAs

Product LCA

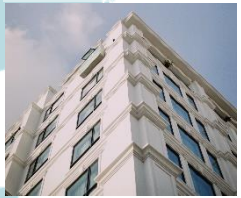
- What is an EPD?
- Why do we want EPDs?
- Where to find them?
- Understanding an EPD?
- Acceptable EPDs.

- Q&A

WORLD'S LEADING CONSTRUCTION & MANUFACTURING LCA SOFTWARE

One Click LCA

BUILDINGS



MANUFACTURING

INFRASTRUCTURE

ACADEMY

OPERATIONS

aws Secure GDPR

MEMBER OF

WORLD GREEN BUILDING COUNCIL · ADVANCING NET ZERO · SBP · HQE · GREEN BUILDING COUNCIL FINLAND · UK GBC · U.S. GREEN BUILDING COUNCIL MEMBER · CONSEJO · ITALIA · BÂTIMENT BBCA BAS CARBONE · MEDLEM · ECO PLATFORM

#1 WORLDWIDE **140+ COUNTRIES** **ALL GLOBAL DATA** **15+ INTEGRATIONS** **160+ STAFF** **20+ YEARS**

Climate Change and Embodied Carbon


CLIMATE CHANGE IS CAUSING REAL, DRASTIC DAMAGE TODAY

Buildings are responsible for 39% of global carbon emissions:

28% from operational emissions

11% from materials and Construction **(Embodied Carbon)**

SOURCE: BRINGING EMBODIED CARBON UPFRONT

THE GLOBAL BUILDING STOCK WILL DOUBLE IN 40 YEARS

Eurasia +1.8B m^2

Western Europe +2.6B m^2

North America +9.8B m^2

China +5.3B m^2

Japan & Korea +0.2B m^2

Middle East +5.6B m^2

Latin America +14.0B m^2

India +25.5B m^2

South East Asia +8.4B m^2

Africa +25.6B m^2

Australia +0.7B m^2

Figures in billions of m2. Sources: Architecture 2030, Global ABC

This will accelerate global warming by six years

One Click LCA

CARBON EMISSIONS

GLOBAL CLIMATE IMPACT

RESOURCE DEPLETION

Source: The City Policy Framework for Dramatically Reducing Embodied Carbon

“ YOU CAN’T MANAGE WHAT YOU DON’T MEASURE.”

Peter Drucker

Building LCAs – What are they?

Life cycle assessment

A structured and standardised methodology

- Methodology for assessing environmental impacts associated with all the stages of the life cycle of a commercial product, process, or service.
- Quantitative analysis.

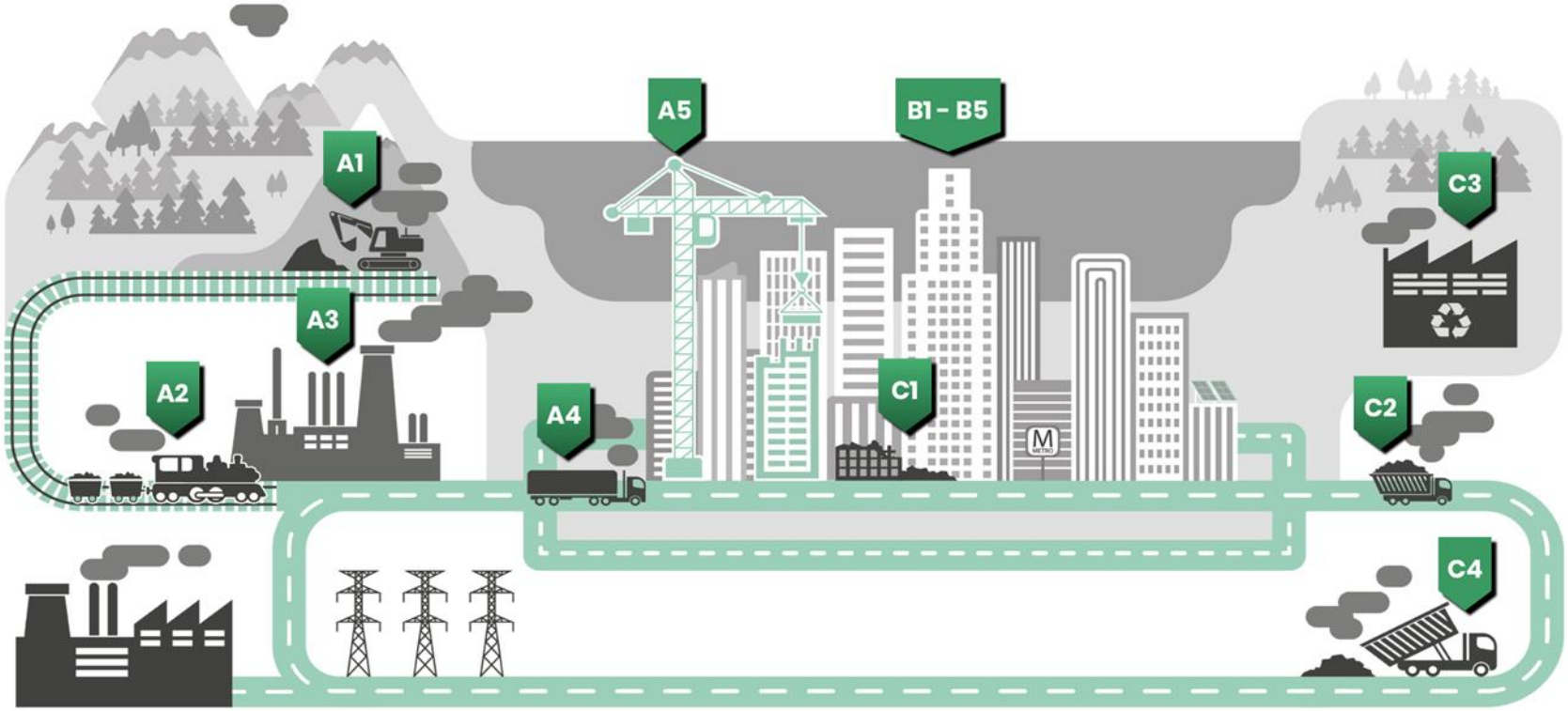
LCA for **Buildings**

LCA for **Products**

Environmental Product Declaration, EPD

EPD

Supported by



A1 - A3 Product stage

A1 Raw material extraction
A2 Transport to manufacturing site
A3 Manufacturing

A4 - A5 Construction stage

A4 Transport to construction site
A5 Installation / Assembly

B1 - B5 Use stage

B1 Use
B2 Maintenance
B3 Repair
B4 Replacement
B5 Refurbishment

C1 - C4 End of life stage

C1 Deconstruction & demolition
C2 Transport
C3 Waste processing
C4 Disposal

EMBODIED CARBON

The carbon footprint of a building before it is built such as:

- Extraction and production of materials
- Transportation of materials
- Manufacturing
- Construction
- Demolition and retrofitting
- End-of-life deconstruction

OPERATIONAL CARBON

The operational carbon footprint of a building is the sum of all the carbon produced **over the lifetime** use of the building such as:

- Lighting
- Heating
- Ventilation
- Cooling, or air conditioning
- General power usage throughout the building

Embodied Carbon + Operational Carbon = Whole Life Carbon (WLC)

Image: Skanska.com.

The Driving Forces Of Building LCAs

The Driving Forces of Building LCA's

	HPI	BREEAM	LEED	EDGE	nZEB	Passivhaus	LEVEL(s)*
Energy Efficiency Energy use + CO_2 emissions	●	●	●	●	●	●	●
Energy Savings	●	●	●	●	●	●	●
Indoor Air Quality Ventilation, VoCs, Radon	●	●	●	●	○	○	●
Water Efficiency Water quality + Testing	●	●	●	●	○	●	●
Daylight Levels Health + Wellbeing	●	●	●	●	●	○	●
Acoustic Comfort Wellbeing + Comfort	●	●	●	●	●	●	●
Embodied Carbon	●	●	●	●	●	●	●
Improving Biodiversity	●	●	●	●	●	●	○
Universal Design Lifetime Homes	●	●	●	●	●	●	○
Connected Location Transport links, facilities, amenities	●	●	●	●	●	●	●
Lifecycle Analysis	●	●	●	●	●	●	●
Circular Economy Design for reuse	●	●	●	●	●	●	●
Nationally Adapted Data fed back into national policy	●	●	●	●	●	●	○

Level 1. Conceptual design

The simplest level includes early-stage design and other concepts but does not include a whole building assessment. This level suggests reviewing LCA studies to identify environmental hotspots.

Level 2. Detailed Design and Construction

This level includes an assessment of the detailed design stage for those who intend to calculate their building project's life cycle GWP emissions.

Level 3. As-built and in-use

This level includes an assessment of the performance of the final design using an updated bill of materials and quantities.

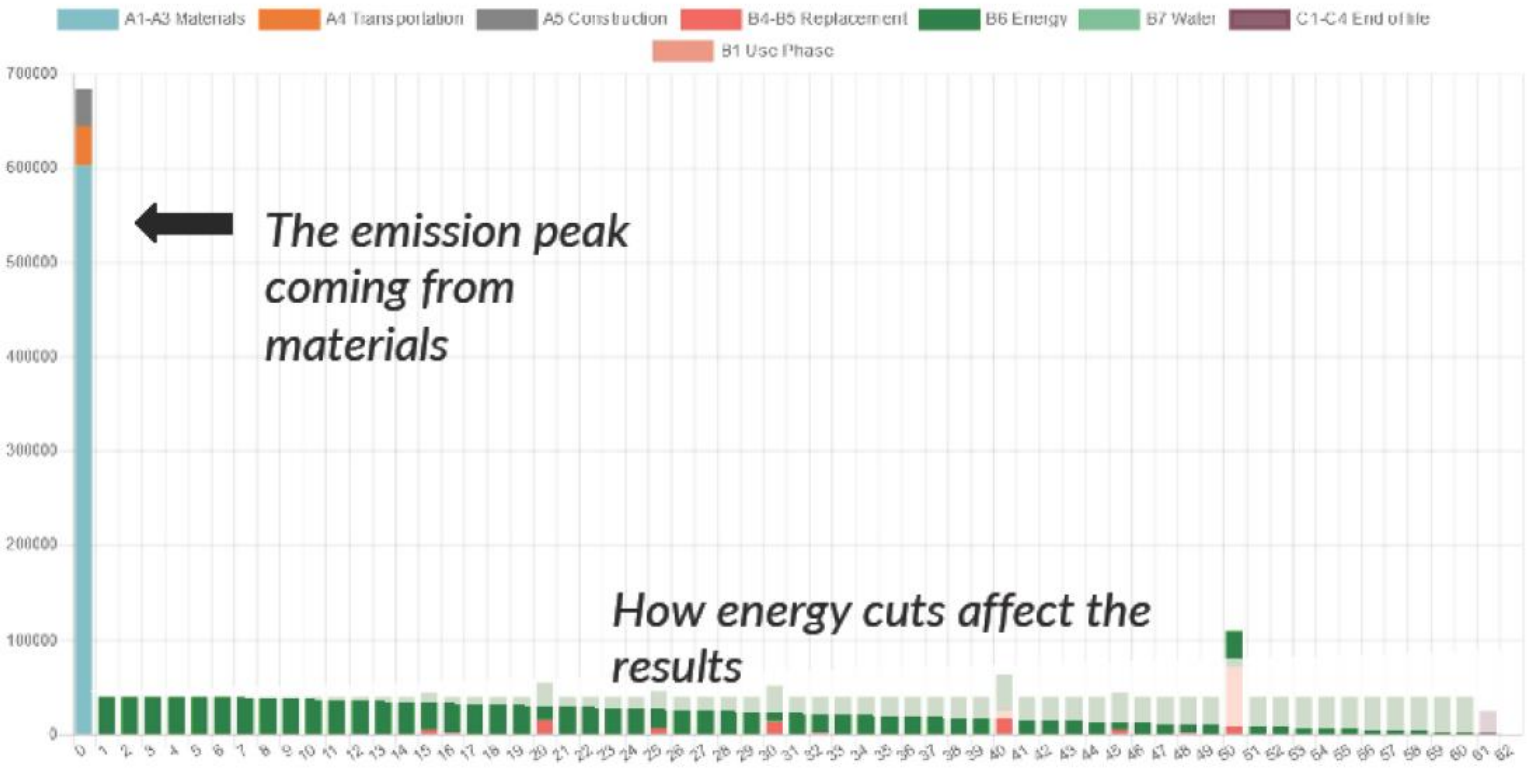
One Click LCA can help users identify environmental hotspots, perform circularity assessments and quantify the benefits in terms of material quantities and carbon. One Click LCA Carbon designer can help to identify environmental hotspots easily in early-stage design.

Using One Click LCA you can calculate environmental impacts (GWP and others) according to Levels scope, compare designs, and optimize impacts.

One Click LCA integrates with 15+ BIM and BEM tools, ensuring that your materials and quantities are accurate.

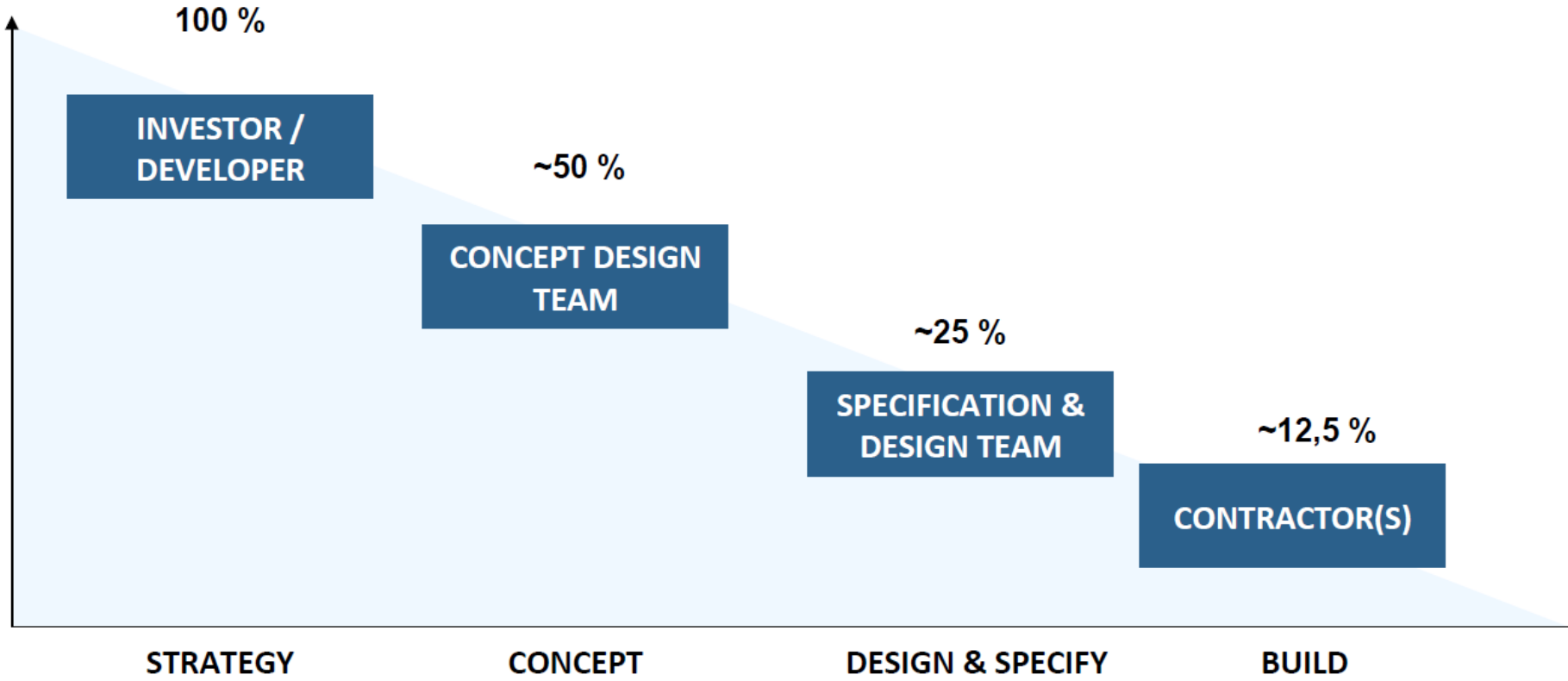
How can One Click LCA help?

Emissions over time



Helene, Level(s) pilot, calculated using One Click LCA

Decarbonization potential halves after each project stage



Changing the project direction becomes increasingly difficult and costly when the project progresses. This limits decarbonization potential, as well as the ability to influence specifications.

IGBC & One Click LCA

The **Carbon Designer for Ireland tool** was developed by the **Irish Green Building Council**, and **One Click LCA**, with support from the **Land Development Agency (LDA)** and the **Environmental Protection Agency (EPA)**.

It is a tool that gives good estimations of outcomes right at the beginning when only a rough size and shape of a building are known. The tool includes build ups common in the Irish market, and some alternatives.

The section in HPI about the LCA Credits was written by OCL

Environmental Product Declarations (EPDs)

What Is An EPD?

Product Category Rules

- Defines the product category.
- Lays out which impacts the manufacturer must share.
- Details how to measure each of these impacts.

Life Cycle Analysis

Typically completed by independent LCA practitioner.
Outlines how the product is made.
Explains each environmental impact and how it was measured

Environmental Product Declaration

- Summarises LCA result.
- Can include additional data not derived from the LCA.
- Can allow for easier comparison between products

Types of EPDs	Description	Use Case	Requirements
3rd Party EPD	*Parent* EPD.	All applications.	1 year production data.
Sister EPD	Full EPD. Variant of a *Parent* EPD.	Good for similar commercial products.	Max variance: ±50% A1-A3 GWP-fossil.
Design phase EPD	18 month validity.	New product on the market.	≥1 month of production data.
Project EPD	36 month validity. Variant of a *Parent* EPD.	Created for a specific contract or project.	1 year of production data.

Why do we want EPDs?

Key Drivers

- Gain credits in other certifications such as LEVELs.
- Achieving targets set by clients.
- Updates to regulations – RIBA & LETI targets, Part Z.
- Raise awareness about carbon footprint.

External drives for EPDs for the company:

- Easier to compare products in the market.
- Helps establish benchmarks and industry averages.
- Identifies improvement opportunities and sustainability initiatives.

WHO USES EPDs ?

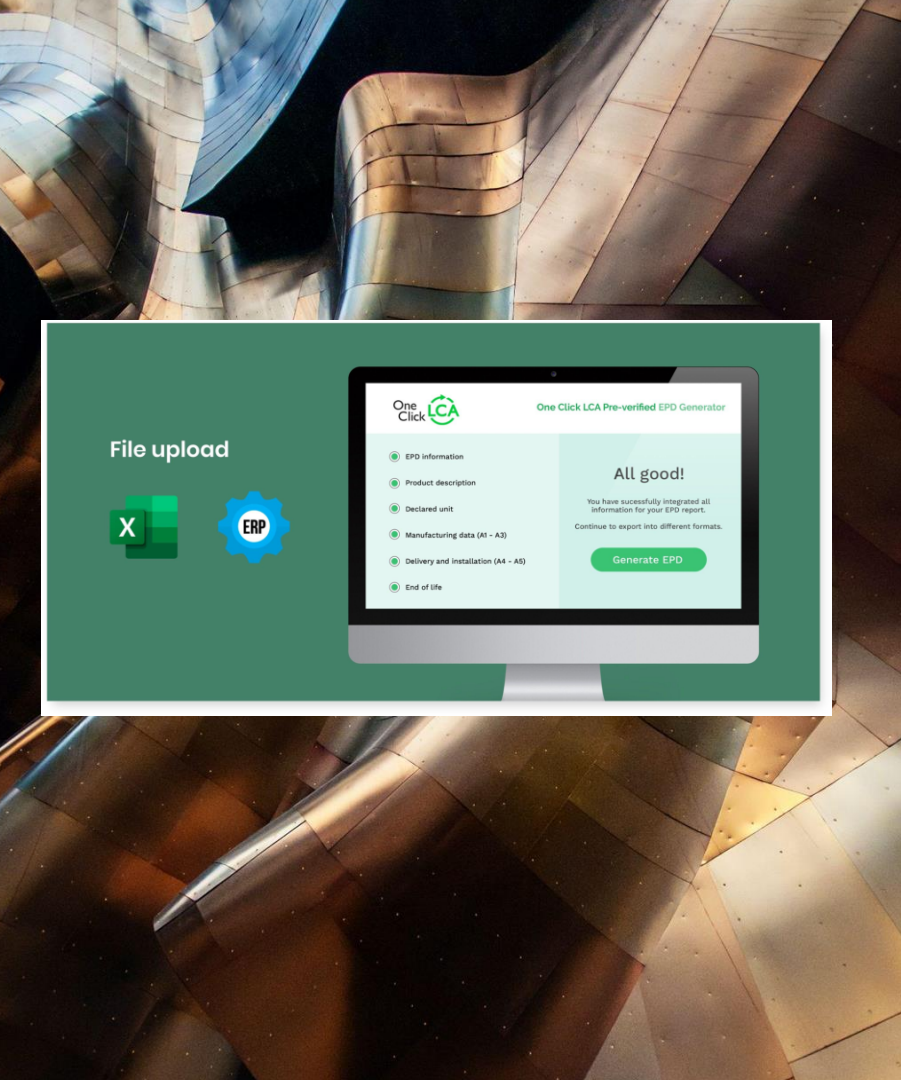
Architects / Designers / Engineers / Developers

1. To compare materials and source more sustainably
2. To Adhere to sustainability compliance standards such as LEVELS / LEED.
3. To Conduct Whole building LCAs. EPDs are the most accurate form of materials data used in whole building LCA calculations.

Manufacturers

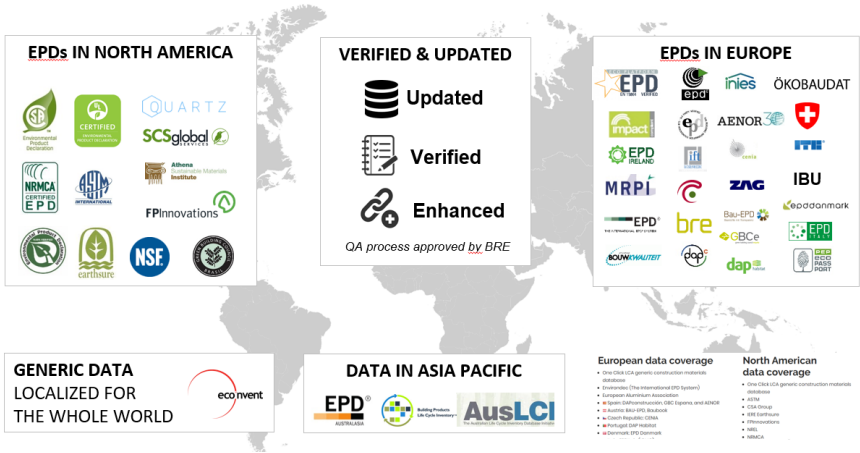
Manufacturers use EPD for a number of reasons:

1. To compare & benchmark against competitor products.
2. Use suppliers EPDs for their own LCAs / EPD calculations.
3. As a Marketing tool to stand out against competitors.

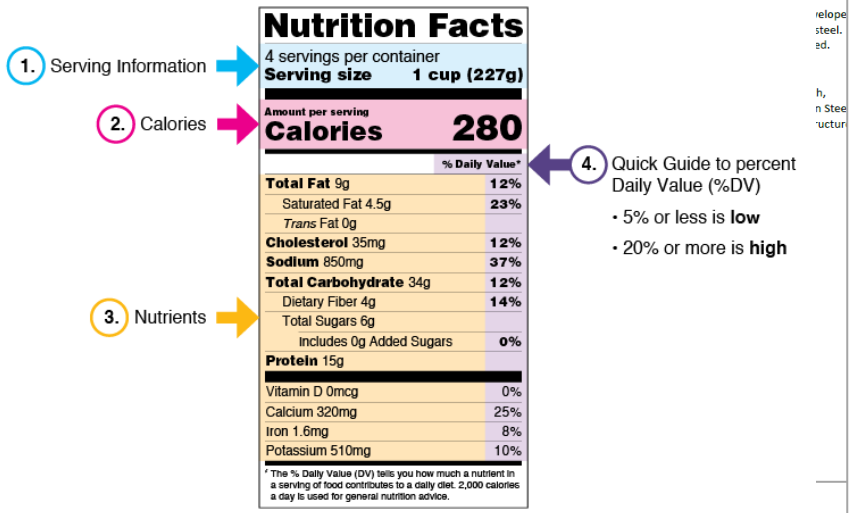


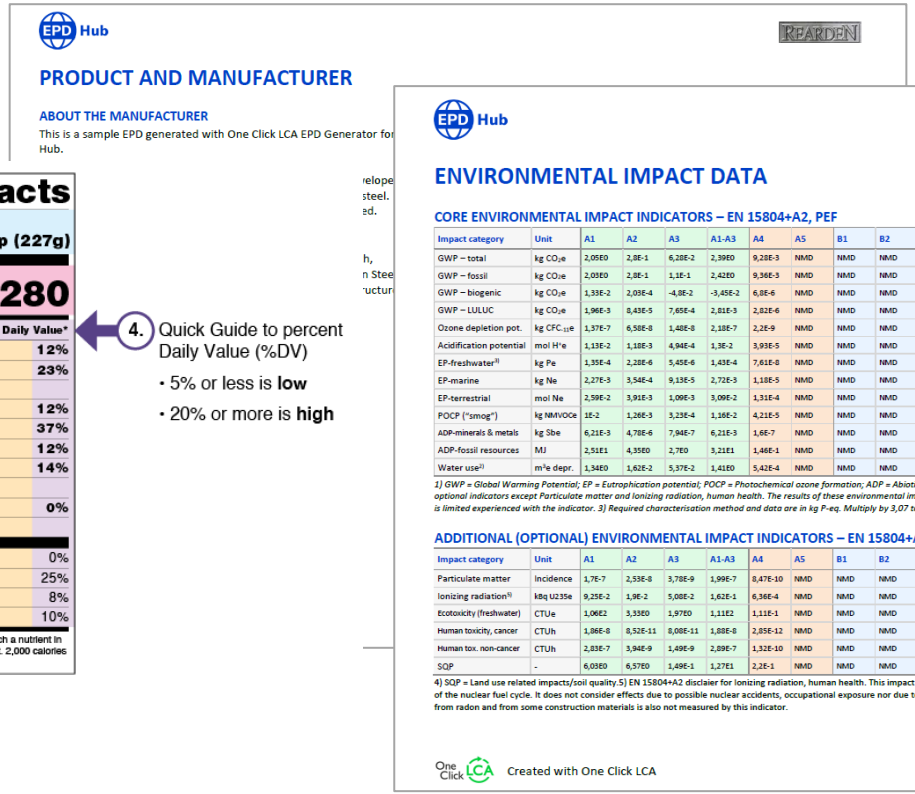
Where to find EPDs?

One Click LCA integrates all the EPDs in the world
They are used by designers, contractors , investors to make the design & procurement choice



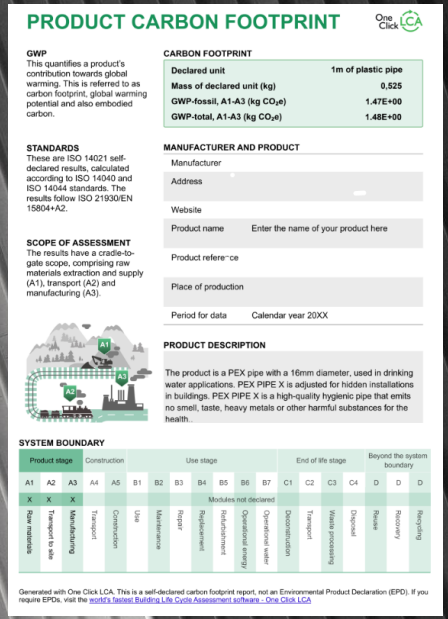
How to Read an EPD





Acceptable EPDs:

Pre-verified information	Third-party verified information
Data sources	Inputted product data
Core LCA model	Limitations and assumptions of LCA
Calculations made by the tool	



PRODUCT CARBON FOOTPRINT

GWP
This quantifies a product's contribution towards global warming. This is referred to as carbon footprint, global warming potential and also embodied carbon.

STANDARDS
These are ISO 14021 self-declared results, calculated according to ISO 14040 and ISO 14044 standards. The results follow ISO 21930/EN 15804+A2.

SCOPE OF ASSESSMENT
The results have a cradle-to-gate scope, comprising raw materials extraction and supply (A1), transport (A2) and manufacturing (A3).

CARBON FOOTPRINT

Declared unit	1m of plastic pipe
Mass of declared unit (kg)	0,525
GWP-fossil, A1-A3 (kg CO_2e)	1,47E+00
GWP-total, A1-A3 (kg CO_2e)	1,48E+00

MANUFACTURER AND PRODUCT

Manufacturer	
Address	
Website	
Product name	Enter the name of your product here
Product reference	
Place of production	
Period for data	Calendar year 20XX

PRODUCT DESCRIPTION
The product is a PEX pipe with a 16mm diameter, used in drinking water applications. PEX PIPE X is adjusted for hidden installations in buildings. PEX PIPE X is a high-quality hygienic pipe that emits no smell, taste, heavy metals or other harmful substances for the health..

SYSTEM BOUNDARY

Product stage			Construction		Use stage							End of life stage				Beyond the system boundary		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
X	X	X			Modules not declared													
Raw materials	Transport to site	Manufacturing	Transport	Construction	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy	Operational water	Deconstruction	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Generated with One Click LCA. This is a self-declared carbon footprint report, not an Environmental Product Declaration (EPD). If you require EPDs, visit the world's fastest Building Life Cycle Assessment software - One Click LCA

- Third Party Verification & Publishing
- ISO 14025
- Carbon Footprint or EPD
- Scope

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with EN 15804, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The background report (project report) for this EPD

Why verification transparency matters? Read more online.

VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier	Irene Independent
EPD verification started on	2 April, 2021
EPD verification completed on	16 April, 2021
Supply-chain specific data %	89 % of the GWP-fossil value
Approver of the EPD verifier	The International EPD System

Author & tool verification	Answer
EPD author	John Doe
EPD author training completion	2 February 2021
EPD Generator module	Cementious Products
Independent software verifier	Anni Oviir, Rangi Maja
Software verification date	29 June 2021

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), it's LCA and project report, in terms of

- the data collected and used in the LCA calculations,
- the way the LCA-based calculations have been carried out,
- the presentation of environmental data in the EPD, and
- other additional environmental information, as present

with respect to the procedural and methodological requirements in ISO 14025:2010 and EN 15804:2012+A2:2019.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, specific product category, the construction industry, relevant standards and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration, and have no conflicts of interest regarding this verification.

Anni Oviir

Questions?