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LCA and Environmental Product Declaration (EPD)

PROCESS | LEGAL REQUIREMENTS | EU

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Content



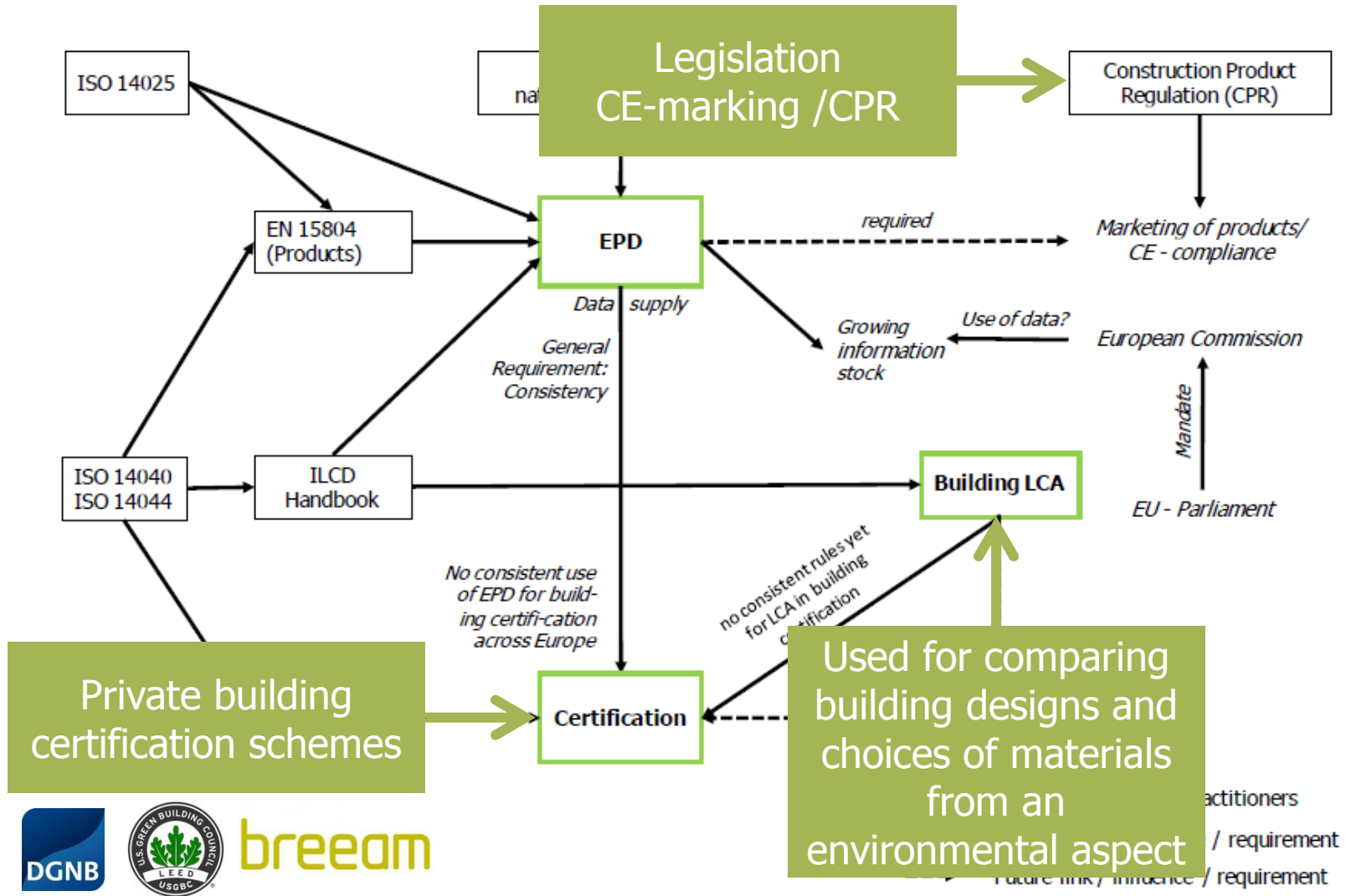
LCA for building products

LCA in the EPD format

Legal requirements and EU



Use of EPD's in Europa



Definition of LCA



DEFINITION OF LCA

LCA's for building products are conducted according to the requirements in ISO 14044, which defines an LCA as:

"Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle"

— ISO 14040

LCI

Life Cycle Inventory analysis
- *"How much of everything"*

LCIA

Life Cycle Impact Assessment
- *"What are the impacts on the environment"*

LCI – Inputs and outputs



The result of an inventory analysis, the LCI, is a table, showing all the different inputs (what we extract from nature) and outputs to nature and how much of everything.

<i>Input</i>	<i>Amount</i>	<i>Output</i>	<i>Amount</i>
Crude oil	0,937 kg	Carbon dioxide	19,1 kg
Hard coal	3,230 kg	Carbon monoxide	0,0176 kg
Natural gas	1,19 kg	Nitrogen oxides	0,0331 kg
Limestone	2,4 kg	Methane	0,0322 kg
Quartz sand	0,18 kg	Chloride	0,0318 kg

What is a life cycle inventory analysis? (LCI)

“Phase of the life cycle assessment involving the compilation and quantification of inputs and outputs for a product throughout its life cycle”

– ISO 14040

LCI – Inputs and outputs



LCI CALCULATION **EXAMPLE**

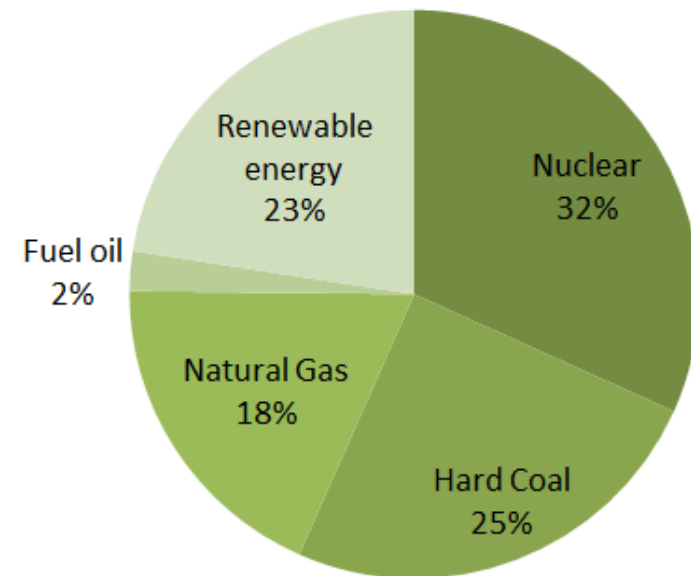
In the production of 1 m² of 120 mm Rockwool insulation batt 94 kWh of electricity is consumed



The diagram shows the electricity grid mix in Germany, which means, that when producing 94 kWh of electricity:

23,5 kWh, approx. **2,8 kg** of Hard coal is added to the LCI table as **input**.

And the emissions released to the atmosphere during the burning of 2,8 kg coal is added as **LCI output**



What is a life cycle inventory analysis?

What is a life cycle impact assessment? (LCIA)

“Phase of the life cycle assessment aimed at understanding and evaluating the magnitude and significance of the potential environmental impacts for a product system throughout the life cycle of the product”

– ISO 14040

In an impact assessment the effects on the environment is evaluated through a number of “impact categories” describing known environmental issues, e.g.:

- Global warming [kg CO₂ eq.]
- Ozone depletion [kg CFC-11 eq.]
- Acidification of soil and water [kg SO₂ eq.]
- Eutrophication [kg (PO₄)³⁻ eq.]
- Photochemical ozone creation [kg Ethene eq.]
- Depletion of abiotic resources [kg Sb eq. / MJ]

LCIA – Environmental impacts

What is a life cycle impact assessment?

“Phase of the life cycle assessment aimed at understanding and evaluating the magnitude and significance of the potential environmental impacts for a product system throughout the life cycle of the product”

– ISO 14040

LCIA calculation **EXAMPLE:**

When burning 2,8 kg of coal, the following 3 gasses (among others) are released to the atmosphere:

CO ₂	1,3 kg
CO	3 kg
CH ₄	6 kg

GWP

1,3 kg CO ₂	x 1
3 kg CO	x 3
6 kg CH ₄	x 25

160,3 kg CO₂ eq.

Characterization factors

What is an EPD?



EPD = Environmental Product Declaration

- An EPD is a communication format!
- ...a way to communicate verified environmental information for products in a consistent way that is easy to understand.
- An EPD does **NOT** tell whether a product is sustainable or not
- An EPD does **NOT** guarantee that the product is more “environmentally friendly” than a product which does not have an EPD (yet)
- **ALL** products can get an EPD!

From LCA to EPD



Why EPD? Why not just LCA?

ISO statement:

"there is no single method for conducting LCA"

WHY? An LCA has a large variety of applications and is conducted on the basis of a long line of assumptions, choices and limitations.

To better ensure comparability and consistency, a standard format is followed, which dictates precisely **what** LCA information is declared and **how**.

= EPD

ISO and EN
standards

+

Programme
operator
guidelines

+

PCR

=

EPD Format

From LCA to EPD



A programme operator:

- Controls the verification process
- Develops PCR's
- Controls EPD content and format based on the standards

ISO and EN
standards

+

Programme
operator
guidelines

+

PCR

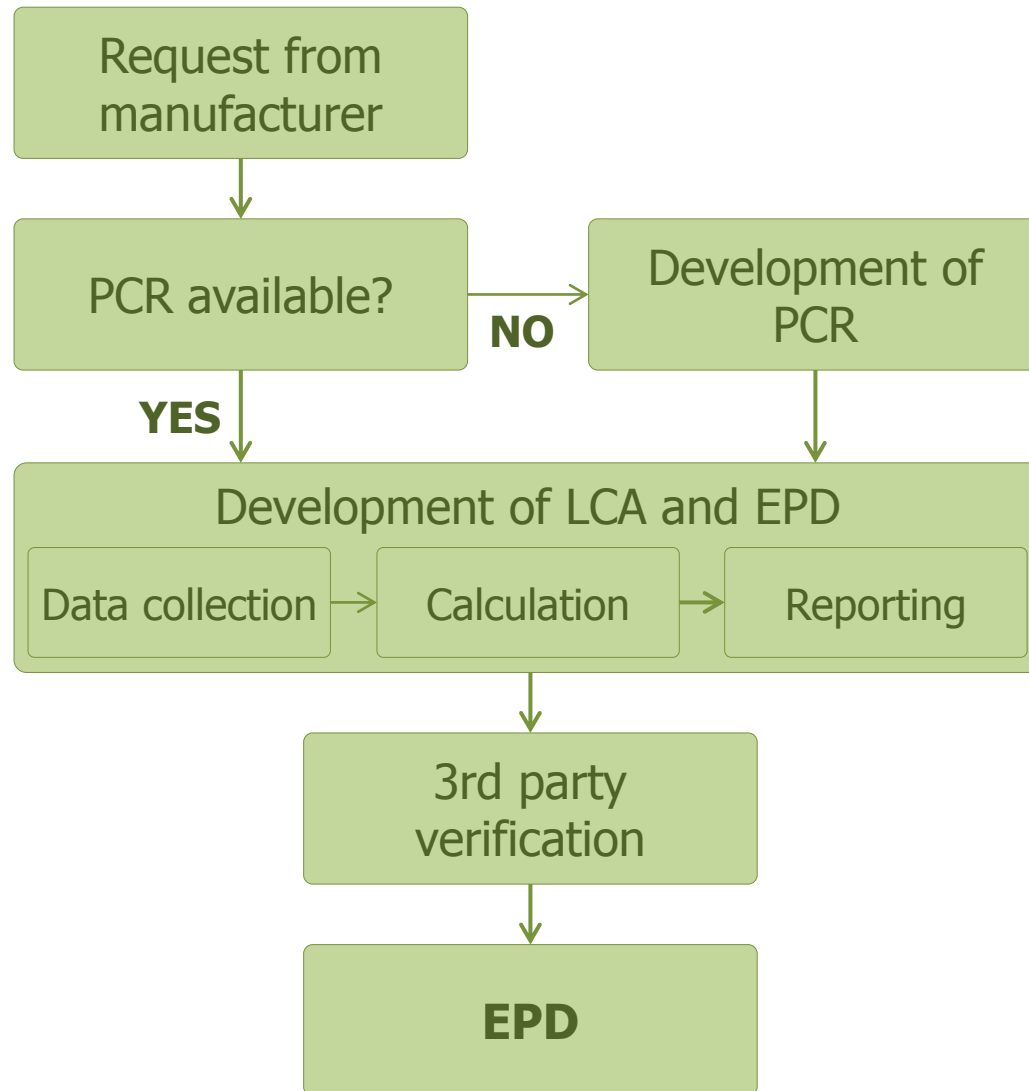
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EPD Format

Programme operators



EPD process overview



Legal requirements & EU



Standardization and harmonized methods and procedures is a prerequisite for legislation.

The European Commission has launched 3 initiatives



EUROPEAN COMMISSION



Legal requirements & EU



CE

The new Construction Product Regulation (CPR) has replaced the old Directive (CPD) and now forms the basis for CE marking.

- “Upgraded” from directive to regulation
- 6 essential requirements are now 7 basic requirements



The 6 essential requirements in the directive:

1. Mechanical resistance and stability
2. Safety in case of fire
3. Hygiene, health and environment
4. Safety in use
5. Protection against noise
6. Energy economy and heat retention

Legal requirements & EU



The 7 basic requirements in the regulation:

1. Mechanical resistance and stability
2. Safety in case of fire
3. Hygiene, health and environment
4. Safety and accessibility in use
5. Protection against noise
6. Energy economy and heat retention
7. **Sustainable use of natural resources**



What's new?

- 3. Hygiene, health and environment** – updated with requirements on the impact on environmental quality and climate in the building LIFE CYCLE
- 6. Energy economy and heat retention** – updated with requirements for the energy use during construction and dismantling
- 7. Sustainable use of natural resources** – New requirement promoting reuse, recycling and use of environmentally compatible raw and secondary materials

Legal requirements & EU



CE

When?

...NOW !!!

The CPR became effective 1st of July 2013...BUT

...the product standards (hENs) has to be revised according to the CPR requirements – and that happens every 5 years.

So in 5 years time from now, every product placed on the EU market has to declare the products environmental performance



CE

How to?

The European Commission (CPR):

*"For the assessment of sustainable use of resources and of the impact of construction works on the environment **Environmental Product Declarations** should be used when available"*

...and that leads us to the next two initiatives from the Commission...

Legal requirements & EU



EUROPEAN COMMISSION



CEN/TC 350

The standards:

This technical committee has developed standardized methods for the assessment of the sustainability of construction works and the standards for the **environmental product declaration of construction products**



Legal requirements & EU



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EUROPEAN COMMISSION



The PEF initiative: (Product Environmental Footprint)

Common methods to measure and communicate the life cycle environmental performance of products in EU

Will form the legislative basis in member state policy making



Legal requirements & EU



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EUROPEAN COMMISSION



So we now have the technical standards

...and the steps necessary for the
implementation of legislation has been taken!



Summary



- Life Cycle Assessment (LCA) is a **methodology** used for calculating and evaluating the environmental performance of a product or system
- Environmental Product Declaration (EPD) is a **Communication format** used for consistent declaration/communication of verified LCA results
- The EPD format will form the basis for **European legislation** regarding environmental performance of building products.
- *...this time it is here to stay* 😊



Thank you for the attention!



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