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European ETICS Forum

Holistic view on sustainable construction – from product data to building certification

05.10.2017

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Goals of this presentation

Understanding,

- **Situation of the European construction market today and in the future (regulatory framework)**
- **Status quo of EAE members in the context of sustainability**
- **Certification schemes and the relevance of the building sector**
- **What needs to be done to meet future requirements**

Regulatory framework in the EU (abstract)

Laws

- New EU rules for Green Public Procurement (GPP) → uses life cycle information as decision parameter
- French & Belgium law on EPDs for construction products → additional national requirements to EN 15804
- Information on climate change and resource management has become mandatory → EU reporting directive (large companies)
- Two degree goal of the Paris climate agreement

Standardization / labelling:

- PEF and OEF regulation
- Harmonisation of EN 15804 and PEF
- 2nd generation of Euro-Codes (life cycle approach)

The association EPDs (1/2)

The German ETICS association has published 5 up-to-date EPDs on IBU platform

ECO platform requirements met		Easy transition of EPDs to Norway, UK and Sweden
Compliance with CPR and EN 15804		Transparency about environmental aspects
Compliance with GPP, DGNB and BNB requirements		High quality data for GPP / green building certifications

The association EPDs (2/2)

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Compliance with French / Belgium legislation		EPDs need to be adapted to the French requirements
Product specific information for building certification		Association EPDs contain general information „only“
Compliance with PEF		PEF expected ~ 2020 → different goal than EPD

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Additional requirements in France / Belgium

- Covering the whole life cycle („Cradle to Grave“) incl. use-phase
- A4 – Transport to Paris
- End of Life: adaption to French circumstances
- Evaluation of impacts “Water pollution” and “Air pollution”
- All documents (EPD and report) in French language
- Verification

~ 5000 € / FDES

+ external costs (AFNOR fees, verification costs etc.)

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Green building market – trends and overview

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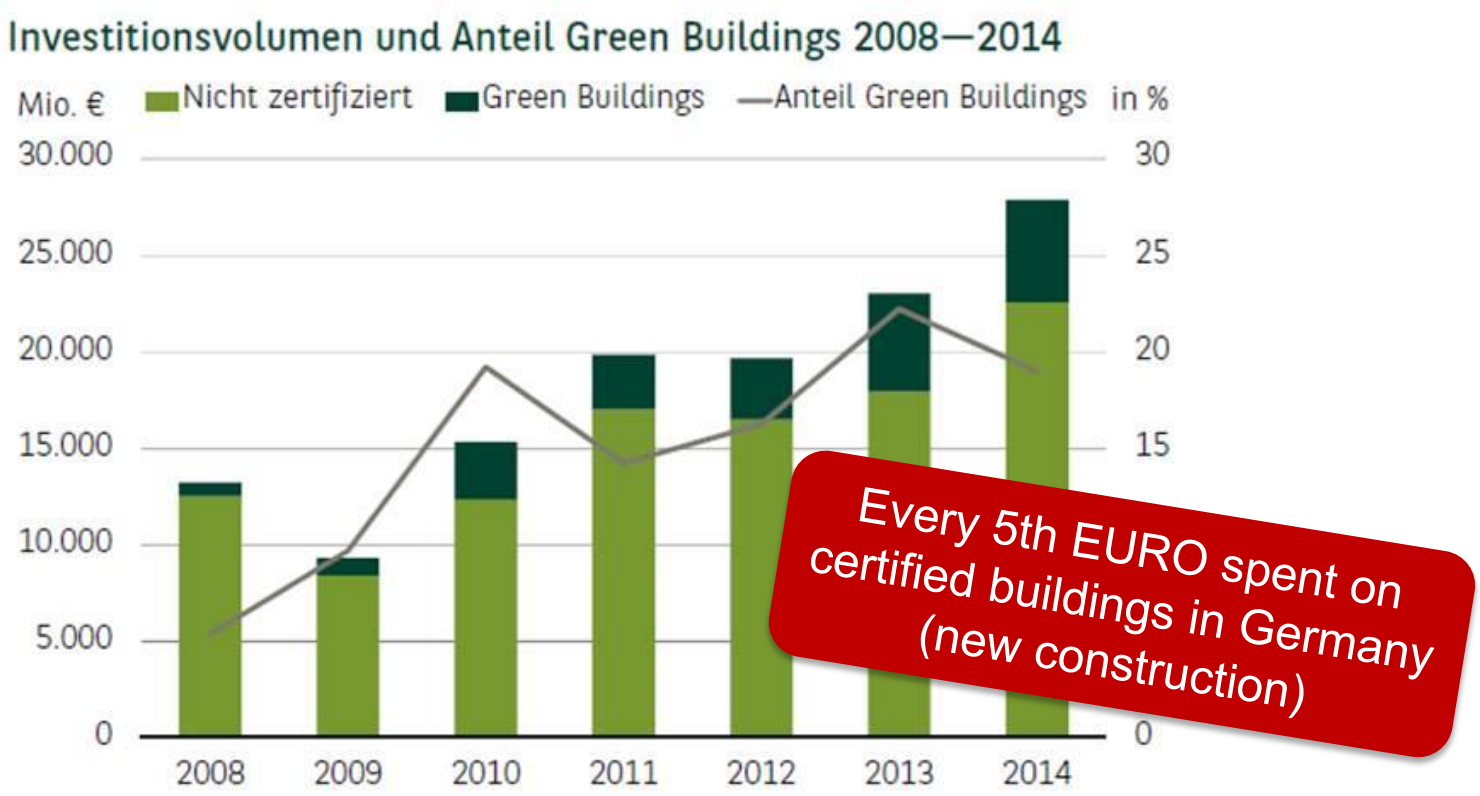
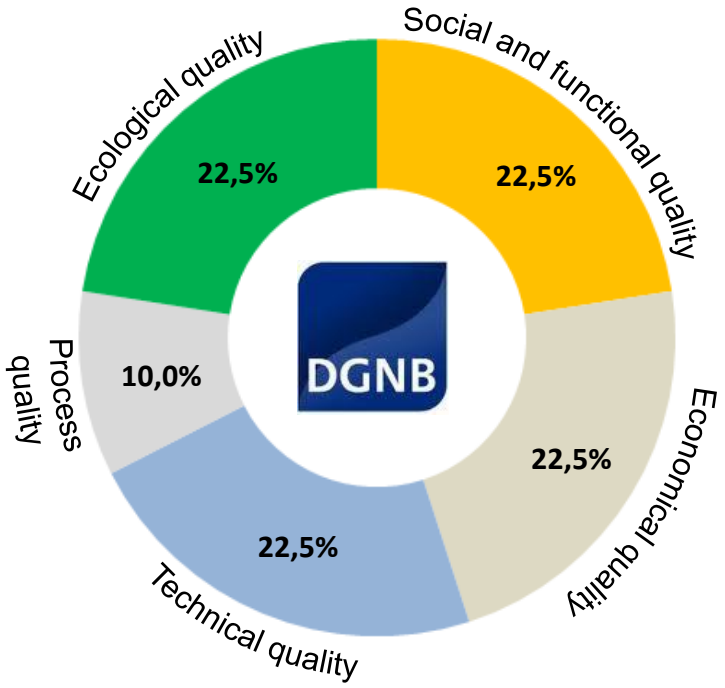
- **Two of the biggest German pre-fab house manufacturers introduce serial certification → more to come**
- **Company had 150.000 downloads per anno of BIM datasets**



Example: evaluation aspects of the DGNB system



The **evaluation goes beyond ecology and energy topics**: social criteria, functionality, technical quality and profitability are evaluated.

In doing so, the **entire life cycle is considered** and everything has to be **documented for proof of performance** - including the processes, such as planning and construction.

Green building projects – example requirements (1/3)

Aspects at building level	Requirements at product level
Resource efficiency and emissions (life cycle assessment)	**Information on the mass balance and life cycle indicators of building products**
Risks for the local environment (e.g. halogens, heavy metals, biocides, VOCs)	**Test reports / certificates**
Deconstruction / recycling and ease of disassembly	**Information on the ease of disassembly, sorted separation and recyclability at the building's end of life** (e.g., can an adhesive be removed residue-free?)

Green building projects – example requirements (2/3)

Aspects at building level	Requirements at product level
Sustainable material extraction (e.g., recycled material, FSC)	**Use of sustainable materials in manufacturing**
Cleaning and maintenance friendliness	**Information about the effort / costs for repair, cleaning and maintenance during the use phase**
Acoustic comfort and sound insulation	**Information on sound insulation properties**

Green building projects – example requirements (3/3)

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Documentation

In certification projects, you must provide information about your products::

- Product descriptions and product safety data sheets
- Maintenance instructions
- Test certificates / information on certified products (Blue Angel, EMICODE, etc)
- Information about the environmental performance of a product over the life cycle as well as on recycling and recyclability information
- …

Example: Greenbuilding Factsheets (1/3)

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The Green Building Factsheet contains **all relevant information** of a product that is **required by a particular building certification scheme** (e.g., LEED, DGNB & BREEAM).

- **Technical properties**
- Information on **LCA** (e.g. EPD acc. EN 15804)
- Information on **healthy living** (e.g. indoor air quality, VOC emissions)
- Indication on **information sources** (e.g. type I, II or III declaration)
- Indication on **information quality** (e.g. indipendent verification, self declaration)
- **Indication on how the building assessment is affected** (e.g., number of points, which is assigned for the fulfillment of a criterion)

Example: Greenbuilding Factsheets (1/3)

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SUSTAINABILITY CONTRIBUTION DECLARATION

LEED v4®
(Leadership in Energy and Environmental Design)

Xxx Product name

Product description and application

TEXT

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SUSTAINABILITY CONTRIBUTION DECLARATION

Energy & Atmosphere (EA)

Fundamental refrigerant management
→ To reduce stratospheric ozone depletion.

Product information

Heating, ventilating, air-conditioning & refrigeration (HVAC&R) systems	Chlorofluorocarbon (CFC) free?	Evidence (quality)

Fundamental refrigerant management
→ To reduce ozone depletion and support early compliance with the Montreal Protocol while minimizing direct contributions to climate change.

Product information

Refrigerant used	ODP equiv.	GWP equiv.

Innovation (IN)

???
→ To encourage projects to achieve exceptional or innovative performance.

Description
Xxx

LOGO

Example: Greenbuilding Factsheets (2/3)

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SUSTAINABILITY CONTRIBUTION DECLARATION

Materials & Resources (MR)

Results of the LCA – RESOURCE USE

Life cycle stages	Product stage	Constr. process stage	Use stage	End of Life Stage			Benefits & loads beyond system bound.
Declared life cycle stages (DIN EN 15804)	A1-A3	A4 - A5	B1 - B7	C2	C3	C4	D
PE total [MJ]							
PERE [MJ]							
PERM [MJ]							
PERT [MJ]							
PENRE [MJ]							
PENRM [MJ]							
PENRT [MJ]							
SM [kg]							
RSF [MJ]							
NRSF [MJ]							
FW [m³]							

Results of the LCA – OUTPUT FLOWS AND WASTE CATEGORIES

Life cycle stages	Product stage	Constr. process stage	Use stage	End of Life Stage			Benefits & loads beyond system bound.
Declared life cycle stages (DIN EN 15804)	A1-A3	A4 - A5	B1 - B7	C2	C3	C4	D
HWD [kg]							
NHWD [kg]							
RWD [kg]							
CRU [kg]							
MFR [kg]							
MER [kg]							
EEE [MJ]							
EET [MJ]							

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SUSTAINABILITY CONTRIBUTION DECLARATION

LEED (Leadership in Energy & Environmental Design)

The LEED green building certification program acknowledges best-in-class building strategies and practices. In order to receive LEED certification, building projects need to fulfill certain prerequisites to earn points to achieve different levels of certification.

Energy & Atmosphere (EA)

- Prerequisite 2 – Minimum Energy Performance – XX Credits achievable
- EA Credit 1 – Optimize Energy Performance – XX Credits achievable
- Prerequisite 3 – Minimum Energy Performance – XX Credits achievable

Material & Resources (MR)

- MR Credit 4 – Recycled Content – XX Credits achievable
- MR Credit 5 – Regional Material – XX Credits achievable

Indoor Environmental Quality (EQ)

- EQ Credit 10 – Mold Prevention – XX Credits achievable

The product contributes to XX points

LOGO

Summary: Greenbuilding Factsheets (3/3)

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- contain **all relevant information** of a product, **tailored to the requirements** of a particular certification system
- are used to **quantify the performance** of a construction product in the sustainability context **on building level**
- contain the **required evidences** for the building assessment
- are used to **quickly and easily** respond to requests for product information in the certification context
- can be used in **marketing and communication** in order to present the sustainable properties of construction products in a clear and structured form

The association EPDs (2/2)

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What is the difference between EPD & PEF?

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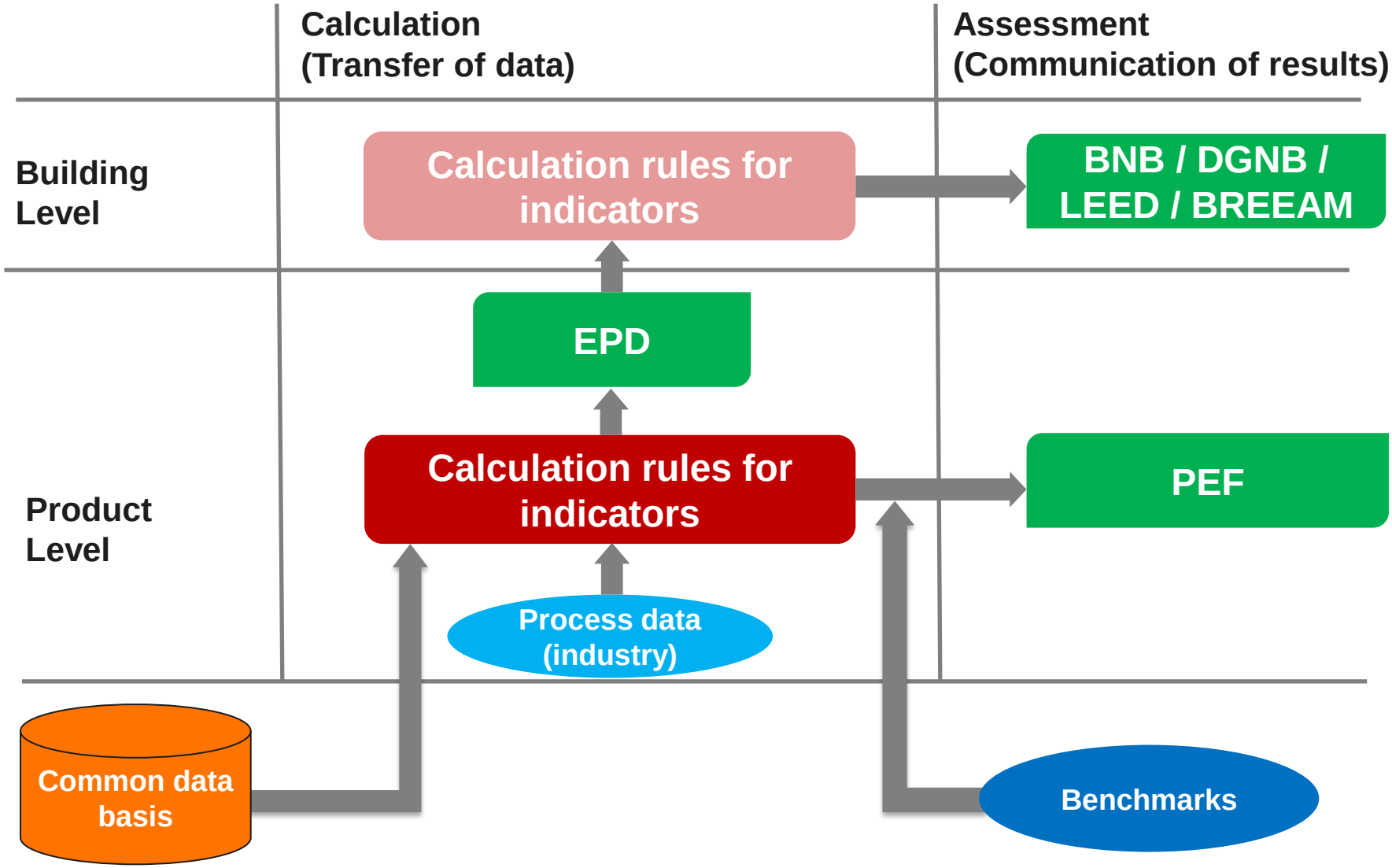
EPD EN 15804	PEF document
Common basics	
ISO 14040ff for LCA ISO 14020ff for communication	ISO 14040ff for LCA ISO 14020ff for communication
Different goals	
Environmental quality of pre-products for buildings → information to evaluate building quality	Environmental quality of a final product → information for the consumer
Competition of products with same function assesed on building level	**Competition at the point of sale based on comparison with representative product**
Tranferability of declarations to buildings Use of indicator results for CPR	**Compareability at the point of sale**

Possible setting in the future



Global construction market relevance (1/2)

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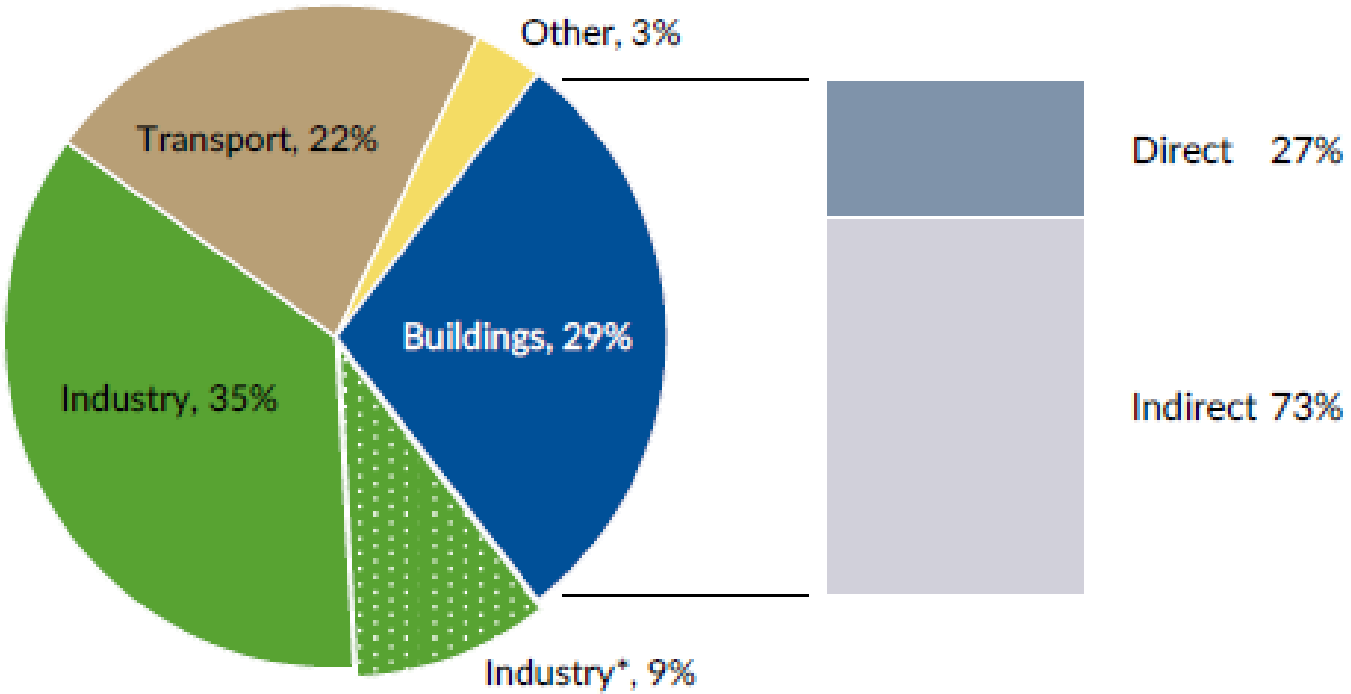
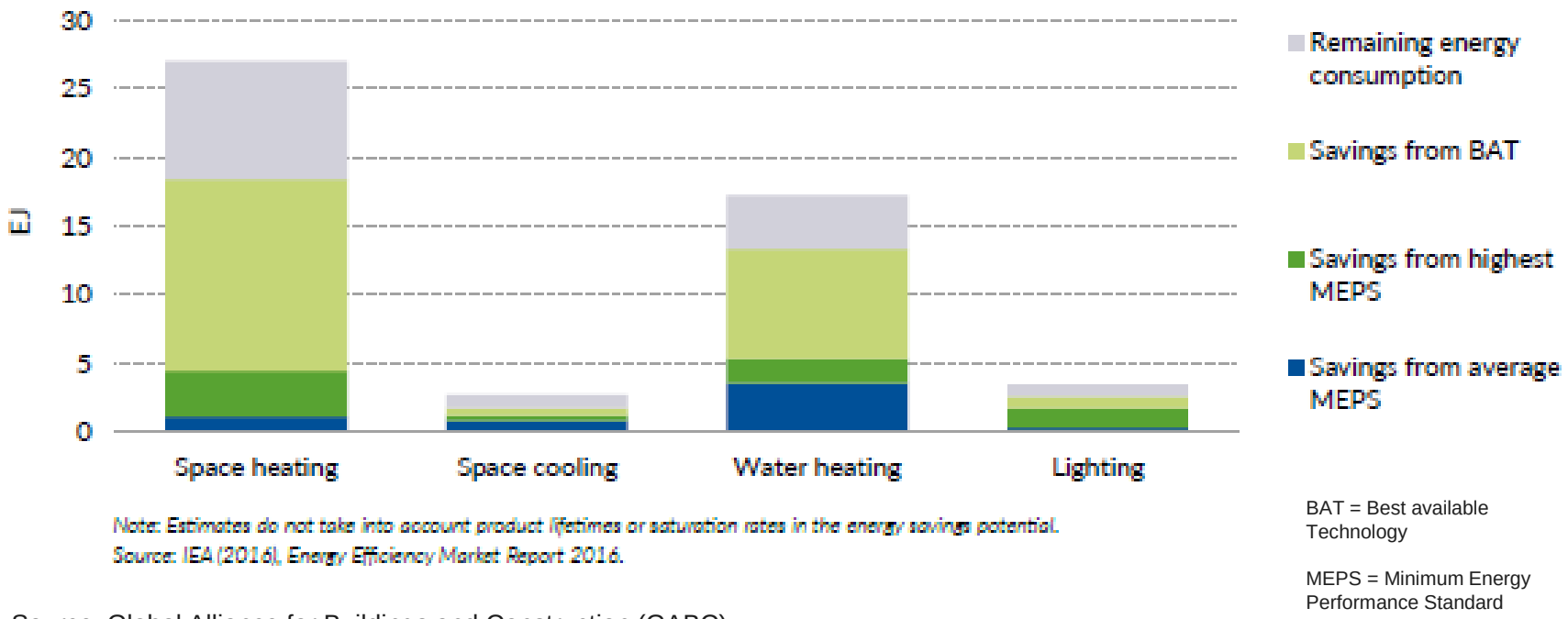
Construction market relevance globally (2/2)



Source: Global Alliance for Buildings and Construction (GABC)

When indirect building emissions from power generation are included, buildings and the construction industry represent nearly 40% of energy-related CO2 emissions globally.

Global construction market - possible savings



BAT = Best available Technology

MEPS = Minimum Energy Performance Standard

Source: Global Alliance for Buildings and Construction (GABC)

Existing technologies can save more than 60% of major end-use energy consumption in buildings – highest saving potential is space heating. This sums up to 84 GtCO2 cumulative global emissions savings potential in the global building sector from measures in buildings.

Visualization of the overall dimension

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Globally approximately $84\ x\ 10^{13}\ t\ CO_2$ could be saved in the building sector. An average car could drive 2.4 million times to the sun with the same amount of CO2 emissions.

An average car emmits 0,2343 kg CO2/km

150.000.000 km x 2.400.000 times

What needs to be done (1/2)

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Reach compliance with French / Belgium law

→ be able to place environmental statements to your products in France/Belgium (these have to be prooved by an EPD)
→ Sell your products in France

Provide product specific information for building certification schemes

→ As an interim solution until EPD and certification schemes are fully harmonized within Europe
→ Show full compliance and performance of your products within the certification context

What needs to be done (2/2)

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Get ready for PEF and the comparison on product level

→ learn about the implications for your industry by conducting a screening study
→ Be able to meet future market requirements

Show the relevance of ETICS for reching the two degree goal

→ assessing the impacts of the application of ETICS globally

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Your contact at thinkstep AG

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