The European voice of the **adhesive** and **sealant industry**

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Construction products: environment & indoor air

BELGIAN FEDERAL PUBLIC SERVICE OF PUBLIC HEALTH

Environmental Product Declarations: Belgian and European context

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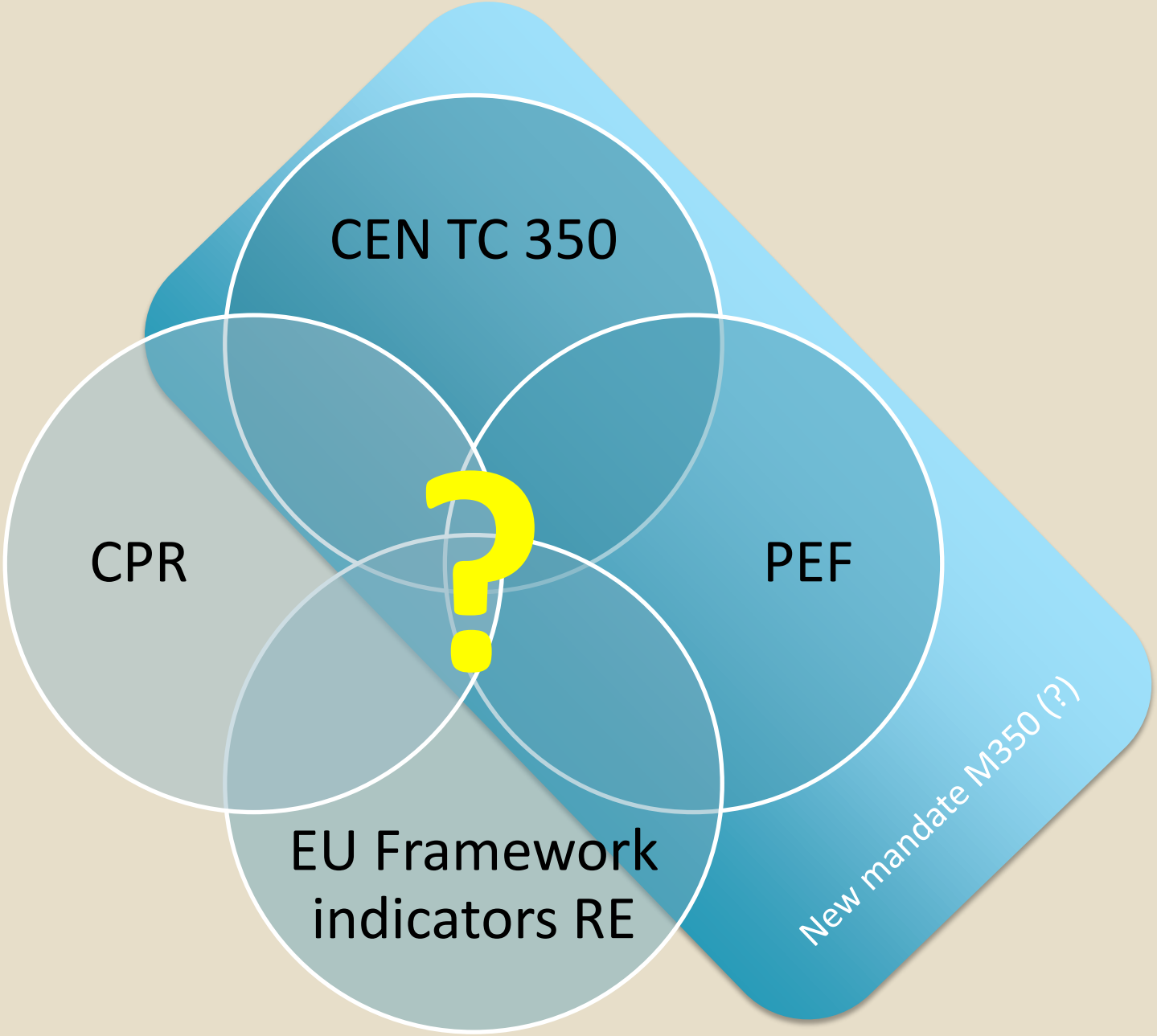
This presentation

- European context
- Belgian context
- Model EPD
- Indoor Air

EUROPEAN CONTEXT


CEN TC 350
CPR
?
PEF
EU Framework indicators RE
New mandate M350 (?)

CEN TC 350

- **Mandate M/350 of 29 March 2004 from EC to CEN**: DEVELOPMENT OF HORIZONTAL STANDARDISED METHODS FOR THE ASSESSMENT OF THE INTEGRATED ENVIRONMENTAL PERFORMANCE OF BUILDINGS
- EN 15804:2012 + A1:2013: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- EN 15978:2011: Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method
- TR 15941: Methodology for selection and use of generic data
- EN 15942: Communication format B2B
- And others (framework, social, economic, …)

CURRENTLY

- Drafting a guidance document for EN 15804
- Drafting a TR on Additional Indicators

Draft TR Add indicators

Step 1: Identify the environmental relevance (see 3.2.2 and Error! Reference source not found.) of the effects and impact categories to be addressed at the building level **Step 2:** Assess the likely relevance of the environmental impact; both at building and at product level (site specific vs embodied) relevance for buildings (see 3.2.3) and construction products (see 3.2.4). **Step 3:** Assess the policy relevance: are the indicators already referred in European legislation (see 3.2.5) or in other European standards.	***standardisation criteria***
The above is used to establish relevance in relation to the TC350 standards of the impact category and its possible indicators.	
Step 4: Establish a list of possible performance based and quantifiable indicators (LCA-based) (see 3.2.6and 3.2.7). **Step 5:** Assess existing LCIA models based on the science based criteria developed by ILCD Handbook (see 3.2.8and Error! Reference source not found.). **Step 6:** Evaluate existing LCIA models based on practice based criteria: availability of characterisation factors and data, and applicability at EU level (see 3.2.9). **Step 7:** Determine if there is any authoritative body in place and their recommendation if any. (see 3.2.10).	***ILCD criteria (slightly adapted for specific context of construction)***

To be discussed coming weeks

Impact category		relevance						Best available methodology at the time of the TR assessment	scientific robustness	applicability			stakeholder acceptance	Proposal for uptake in EN 15804							proposal for uptake in 15978					
		environment	buildings	products	policy	performance based	quantifiable			data availability	experience	availability in tools		mandatory	optional	mandatory additional information	optional additional information	rejected	Methodology	Remarks	mandatory	optional	mandatory additional information	optinal additional information	rejected	Remarks
Human toxicity	HT - cancer	X	X	X	X	X	X	Usetox v1.0	1	2	2b	X	3				X		Usetox version 2.0	4,5				X		
	HT - non cancer	X	X	X	X	X	X	Usetox v1.0	1	2	2b	X	3				X		Usetox version 2.0	4,5				X		Rejected because optional in EPD and therefor not possible yet to agregate at building level
Ecotoxicity	marine	X	X	X	X	X	X	Usetox v1.0	6	2	2b	X						X	-						X	
	freshwater	X	X	X	X	X	X	Usetox v1.0	1	2	2b	X	3				X		Usetox version 2.0	4,5				X		
	terrestrial	X	X	X	X	X	X	Usetox v1.0	6	2	2b	X						X	-						X	
Particulate matter (respiratory inorganics)		X	X	X	X	X	X	Riskpoll/Humbert (2009)	X	8	X	X	X			X			Riskpoll/Humbert (2009)	9			X			
Ionizing radiation	human health	X	X	X	X	X	X	Frishknecht et al (2000)	X	X	X	X	X		X				Frishknecht et al (2000)	10		23				
	ecosystem health	X	X	X	X	X	X	Garnier-Laplace et al (2008/2009)	X	X	X	X	X		X				Garnier-Laplace et al (2008/2009)	10		23				
Land use related impact	General / single indicator	X	X	X	X	X	X	*JCR method under development*	-						(X)					20	(x)					
	Biodiviversity (end point)	X	X	X	X	X	X	LC-Impact LU		15								X								X	Additional non-LCA indicators are possible
		X	X	X	X	X	X	ReCiPe	6	15	X	X						X								X	
		X	X	X	X	X	X	EcoIndicator 99									X		EcoIndicator 99	21, 22				23		
	Soil quality	X	11	11	X	X	X	Milà i Canals et al. 2007	16	15		19					X		Milà i Canals et al. 2013 update	21				23		
	Ecosystem functions	X	12	12	X	X	X	.(14) / Lanca	?	15		18						X		17					X	
	Resource depletion	X	13	13	X	X	X	*Not assessed in the TR*	-									X							X	
water scarcity		X	X	X	X	X	X	AWaRe method (2015)	X	X		22	24	?	?				AWaRe method (2015)		?	?				

PEF – product environmental footprint

- *Communication from the Commission to the European Parliament and the Council*: ***Building the Single Market for Green Products*** *- Facilitating better information on the environmental performance of products and organisations* (April 2013)
  - barrier for the circulation of green products
  - Consumers are also confused by the stream of incomparable and diverse environmental information
- 2013/179/EU: Commission Recommendation of 9 April 2013 on the use of common methods to measure and communicate the life cycle environmental performance of products and organisations Text with EEA relevance
- it establishes two methods to measure environmental performance throughout the lifecycle, the Product Environmental Footprint (PEF) and the Organisation Environmental Footprint (OEF);
- it recommends the use of these methods to Member States, companies, private organisations and the financial community through a Commission Recommendation;
- it announces a three-year testing period to develop product- and sector-specific rules through a multi-stakeholder process;

Not only for construction products.

Construction products in the pilot phase:

- Hot and cold water supply pipes
- Metal sheets
- Photovoltaic electricity generation
- Thermal insulation
- Decorative paints

Major differences with CEN TC 350

- Modularity / add up products at building level
- Impact categories
- EOL
- Module D
- Data quality requirements
- Normalization / weighting

New M350

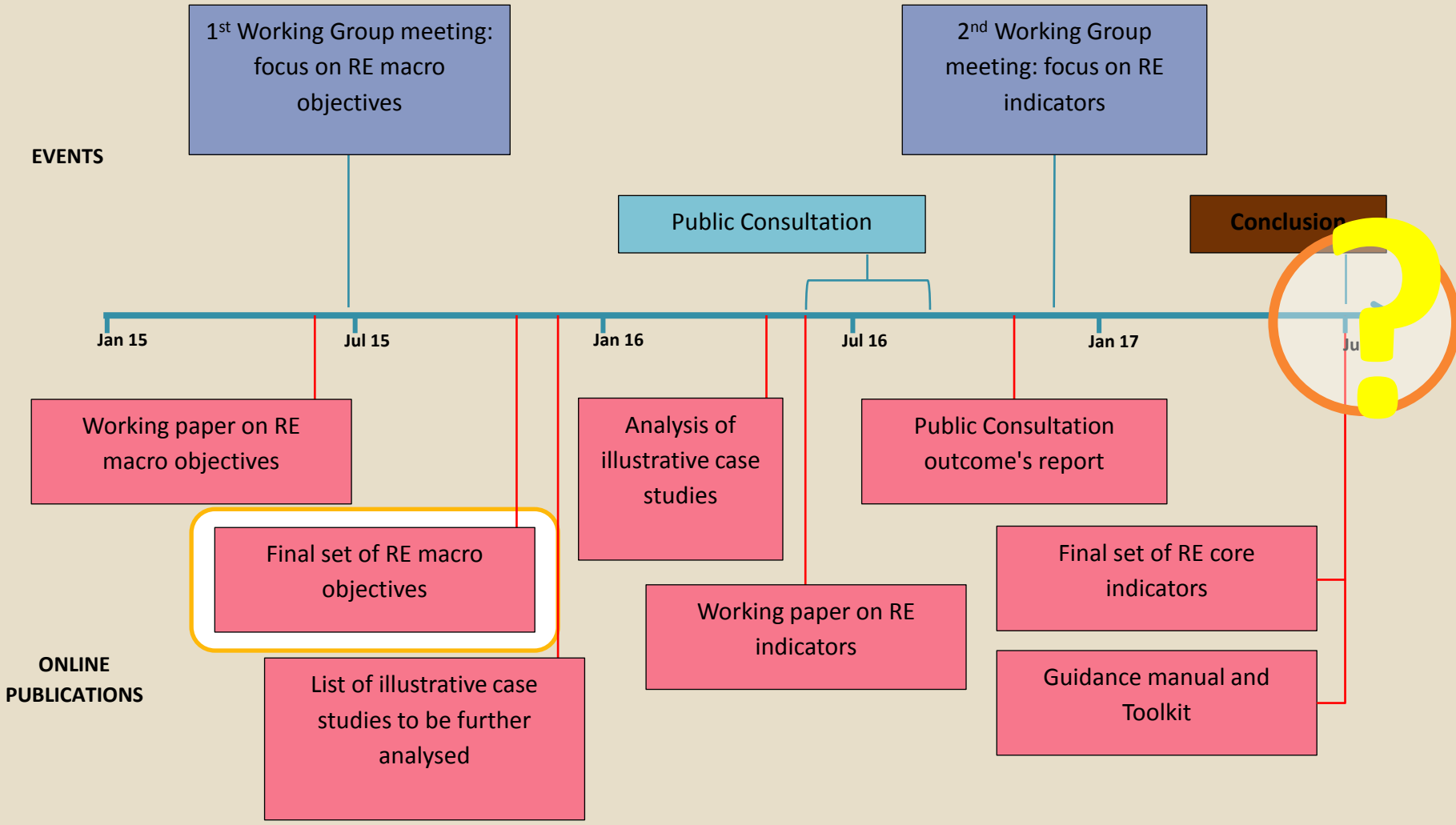
!! NEW !!

- Joint initiative of DG GROWTH and DG ENV
- The amendment is aiming to solve, or at least reduce to the maximum extent possible, inconsistencies between the requirements included in the standards developed by CEN under mandate M/350 and those included in the Product Environmental Footprint method adopted by the Commission with the Recommendation 179/2013 and evaluated in pilot projects for construction products in 2014-2016.
- The work should be focused on the following issues:
  - Better definition of the functional unit
  - Approach to deal with End of Life (including but not limited to Module D)
  - Selection of impact categories and related impact assessment methods
  - Other methodological requirements (offsetting, biogenic carbon, carbon storage and delayed emissions, accounting for electricity use)
  - Data quality requirements
  - Data sources hierarchy
  - Normalisation and weighting
- First draft circulated 5-10-2015. New mandate finalized 2nd half 2016?

EU FRAMEWORK

!! Important !!

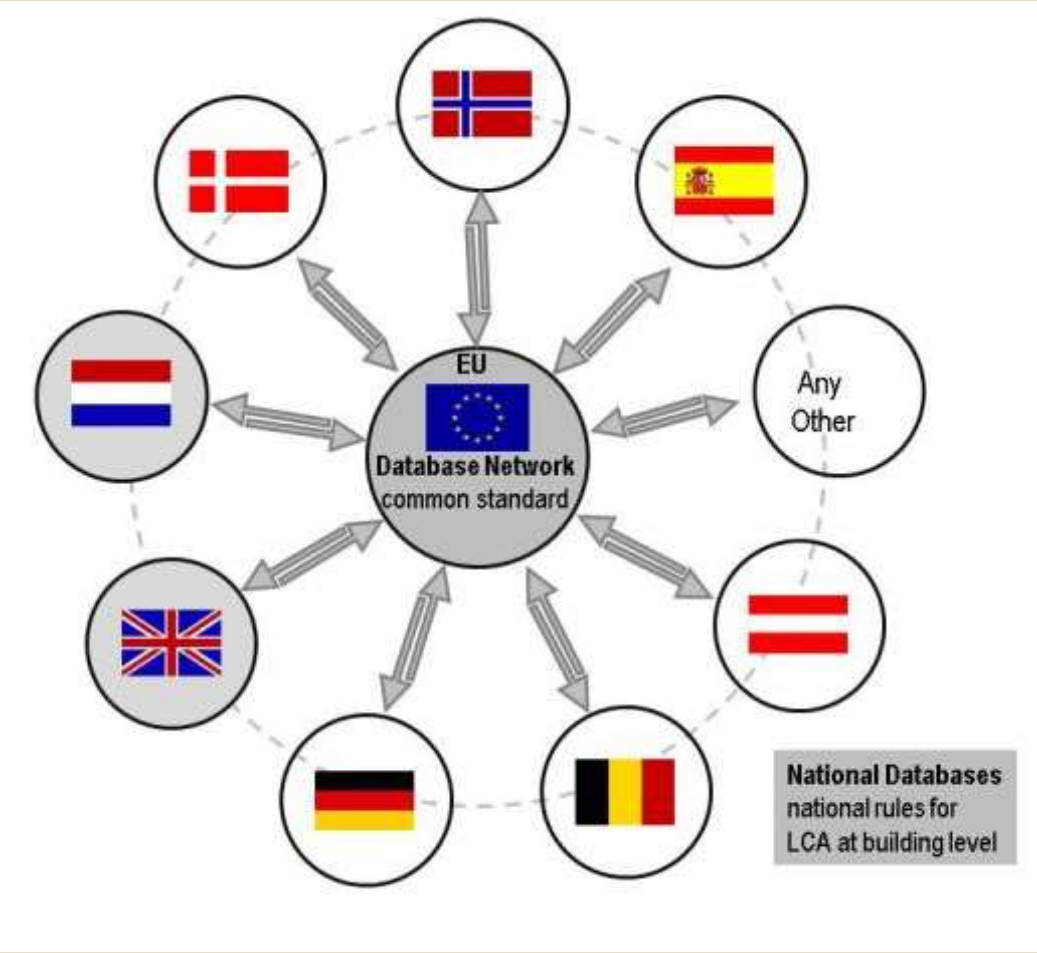
- 1.7.2014: COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS ON RESOURCE EFFICIENCY OPPORTUNITIES IN THE BUILDING SECTOR
- While different national and commercial schemes may have reasons to diverge slightly in their approaches (e.g. specific materials or climatic considerations), a common framework of **core indicators**, focusing on the most essential aspects of environmental impacts should nonetheless be established.
- it should be possible to use it: 1) directly by building professionals and their clients to prioritise their focus for making environmental improvements, as well as; 2) indirectly by assessment and certification schemes to ensure that their criteria reflect priority areas of focus for resource efficiency at a European level and to assure the comparability of data and results.
- The Commission (DG ENV, DG GROWTH, JRC) will lead the framework development but will do so in close co-operation with relevant stakeholders.



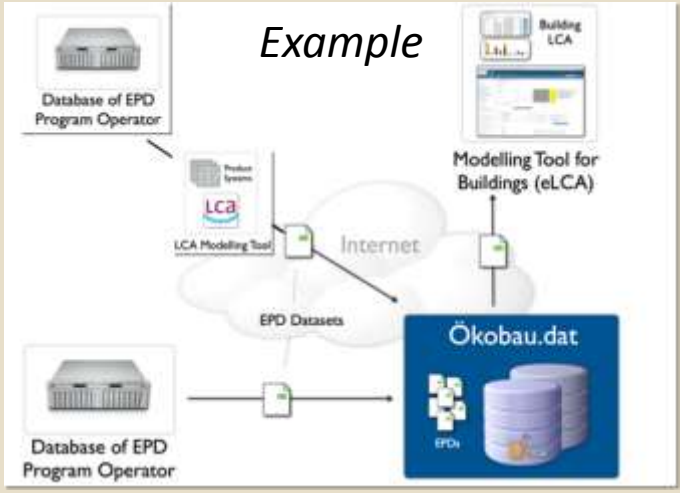
Source: EU Commission

InData

!! NEW !!



- started after informal contacts between BE and DE last year.
- Voluntary working group of MS
- Now: drafting a project description
- Goal: one declaration, easy uptake different databases, connected databases.



CPR 305/2011

- Construction products regulation
- (56) For the assessment of the sustainable use of resources and of the impact of construction works on the environment Environmental Product Declarations should be used when available.

- 7. Sustainable use of natural resources

  The construction works must be designed, built and demolished in such a way that the use of natural resources is sustainable and in particular ensure the following:

  (a) reuse or recyclability of the construction works, their materials and parts after demolition;

  (b) durability of the construction works;

  (c) use of environmentally compatible raw and secondary materials in the construction works.

Some other MS

France

- Inies & government database
- **Obligation in case of environmental claims**
- AFNOR program operator
- National addendum to EN 15804
- Building assessment tool: HQE performance
- Focus on materials including building level

Germany

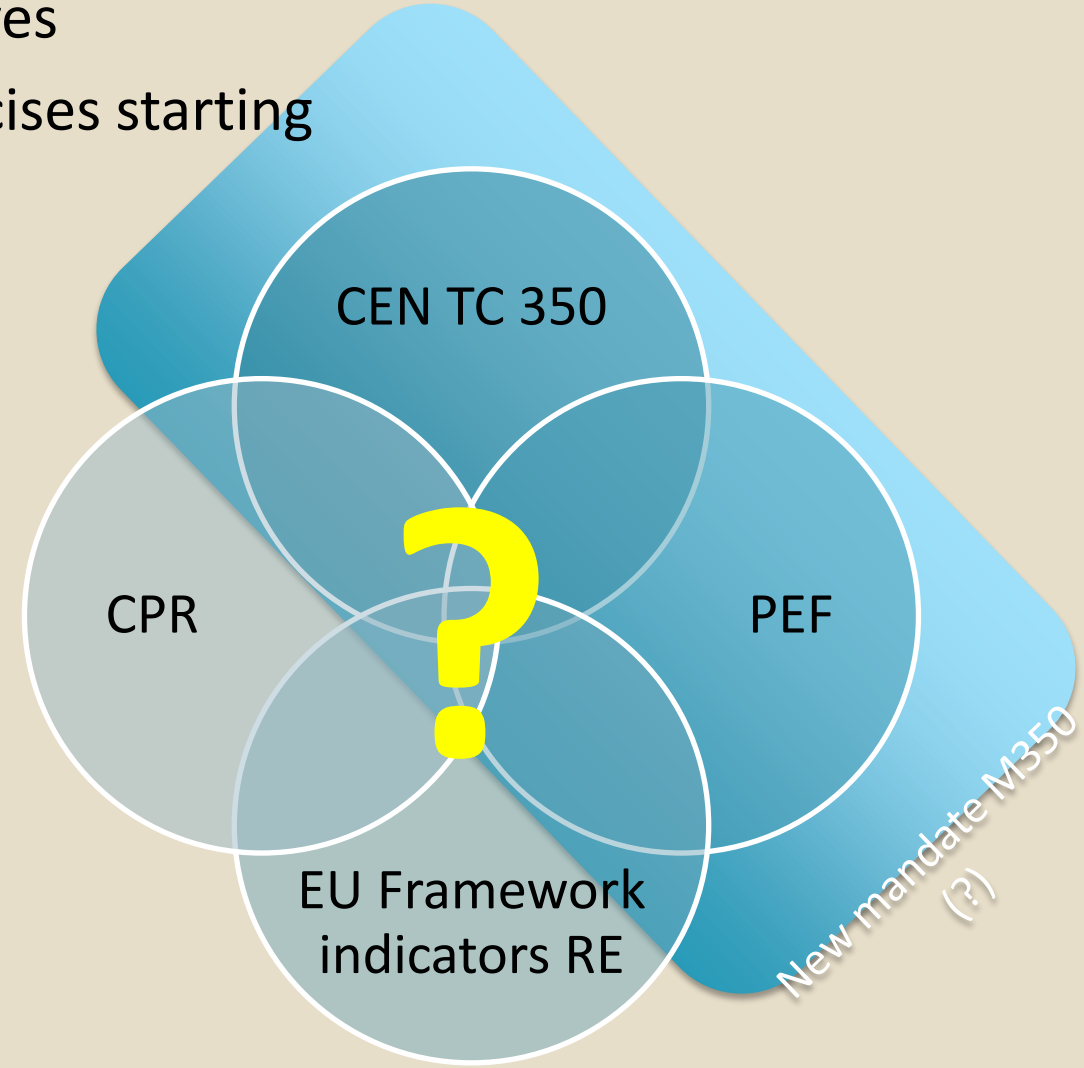
- Ökobau.dat
- IBU program operator
- **public buildings**
- EN 15804
- LCI: only Gabi
- Building assessment tool
- Focus on buildings

Netherlands

- Nationale Milieudatabank
- MRPI program operator
- SBK
- Additional indicator
- (Not yet) EN 15804 – new version of NL method upcoming
- Building assessment tool
- **Obligation building permit**
- Focus on materials including building level

Conclusion

- Different initiatives
- Converging exercises starting



BELGIAN CONTEXT

Federal authorities

- Responsible for the (environmental) performances of the **product** placed on the market

- Construction products Regulation (305/2011)
  - BWR 3. Hygiene, health and the environment
  - BWR 5. Protection against noise
  - BWR 6. Energy economy and heat retention
  - BWR7. Sustainable use of natural resources
- Ecodesign, Rohs, Ecolabel, PEF, …

Regional

- Quality

of the environment

Land planning
Building permits
Environmental performance of buildings
Energy performance of buildings
Waste
…

No hierarchy >> need of dialogue and cooperation

Belgian context

MY FIRST TASK IN 2005: PROMOTE SUSTAINABLE PRODUCTS!

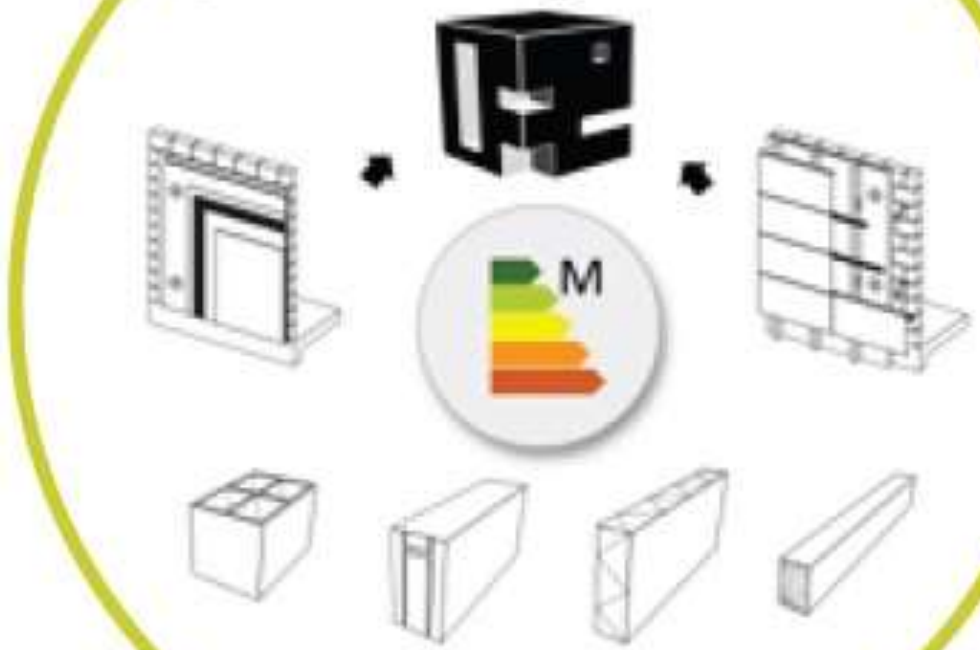
My first question: what are sustainable products?

http://health.belgium.be/eportal/Environment/19094872_NL?fodnlang=nl#.VImstUs5-vc

Belgian context

BUILDINGS NEED LCA

4. Environmental performance of materials in building (elements)

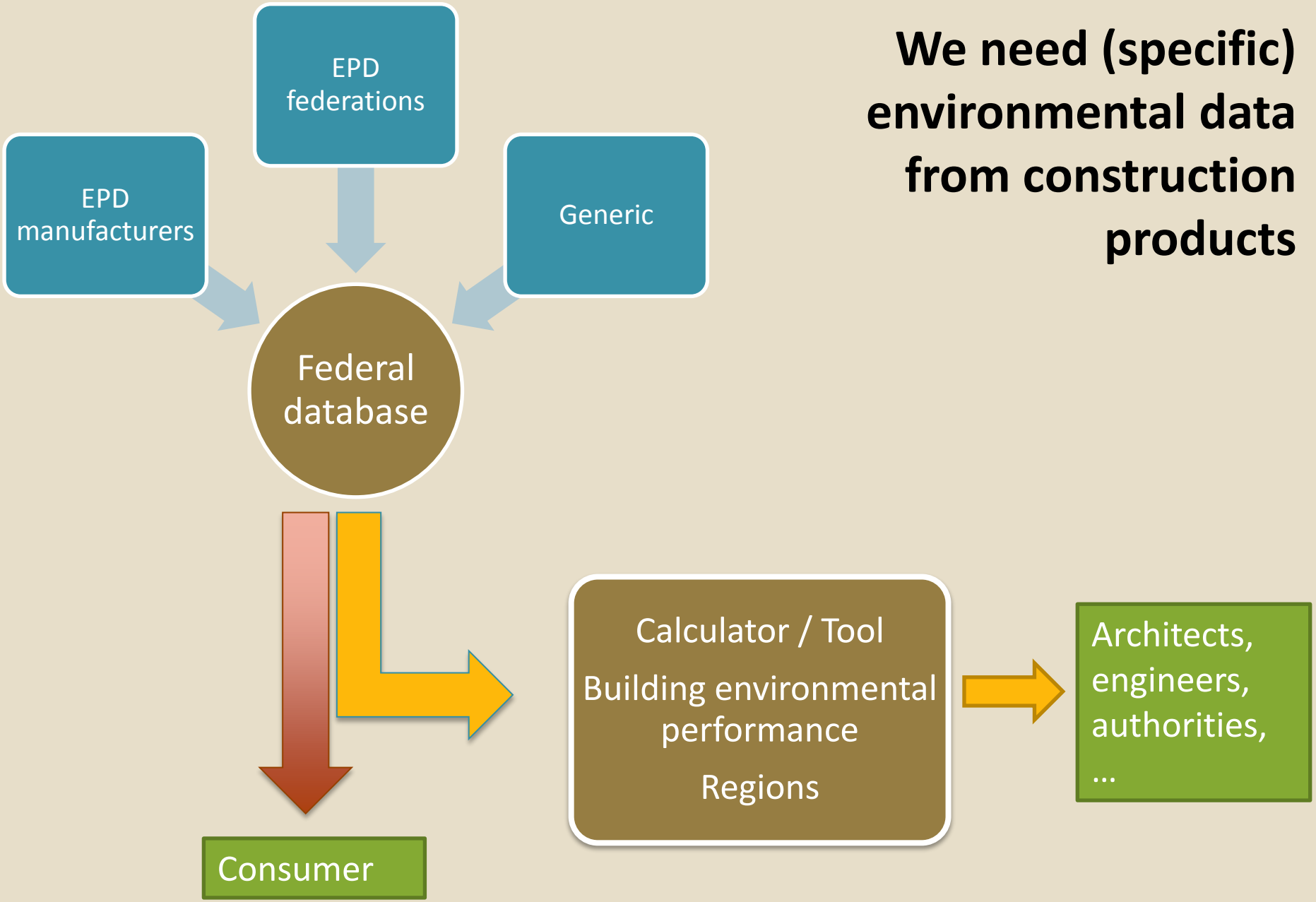


- Aggregating the different LCA of the products: *Embedded environmental impact of a building*
- Calculation tool for architects: under development by the regions, based on CEN TC 350. First version 2015.
- Collect data at product level // Assessment at building level
- Product comparison only within product groups for production process optimization
- < sustainable building

Illustration: OVAM

http://www.ovam.be/sites/default/files/FILE1368696514672Environmental_profile_buildig_elements_LR.pdf

We need (specific) environmental data from construction products



We need **ALL** relevant impact categories

- Prevent burden shifting
  - Life cycle (LCA)
  - All relevant indicators
    - Global warming
    - Acidification
    - Eutrophication
    - Abiotioc depletion
    - Tropospheric ozone formation
    - Land use, soil quality, …
    - Biodiversity
    - Particulate matter
    - Ecotoxicity
    - Human toxicity
    - Water depletion

CEN TC 350 WI 00350023 drafting **Technical Report Additional Indicators** *(Lead by NBN support from Federal Authorities: KUL, VITO)*	European Commission **Product Environ-mental footprint** *(pilot phase)*	Belgian Royal Decree 22/5/14

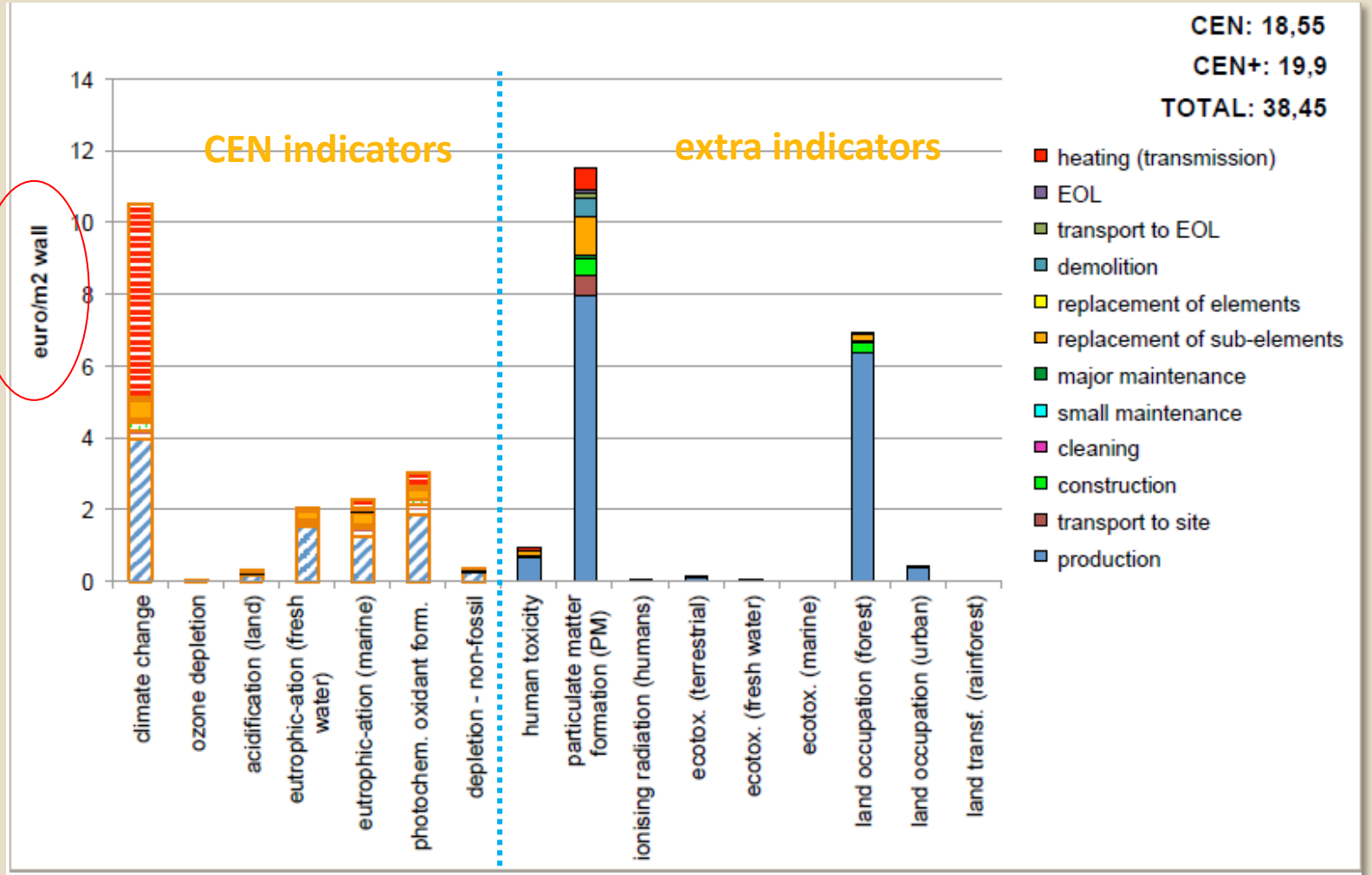


Figure exterior wall 2.2.3: Aggregated environmental profile (divided into CEN and CEN+) of variant 'EW2_timber frame_RW22_facing brick' per life cycle stage and per individual environmental indicator, expressed in monetary units.

OVAM/MMG - English extended summary available:
http://www.ovam.be/jahia/Jahia/cache/offonce/pid/176?actionReq=actionPubDetail&fileItem=3072

Belgian context

CONSTRUCTION PRODUCTS NEED LCA

From « I have the most environmentally friendly product » …

Because my product..

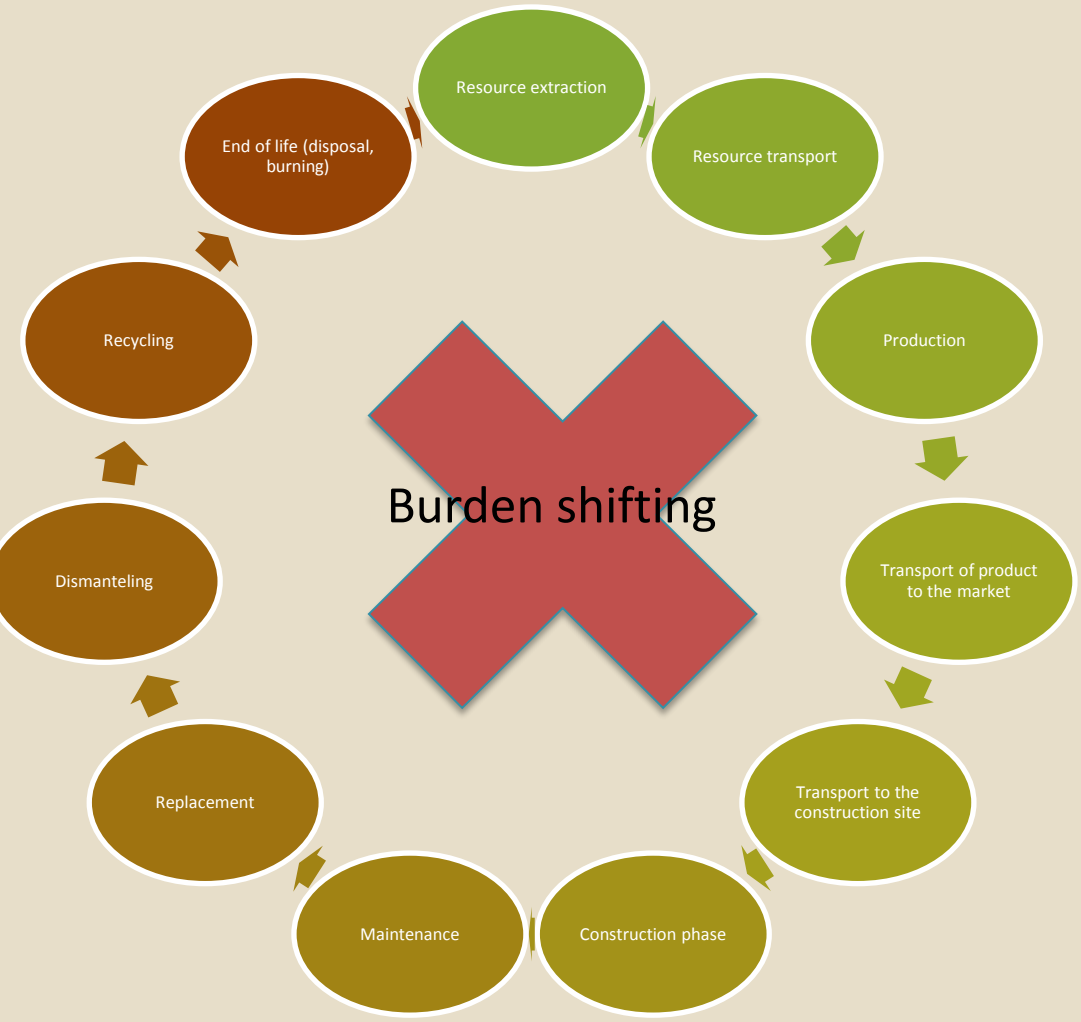
- Is based on natural materials
- Has 20 % recycled material
- Has a very low carbon footprint
- Has lower environmental overall impact

But…

- pesticides? Land use? Service life?
- transport to recycling centre?
- Other environmental impacts?
- technical performance?
- bad building design?

- Often lack of transparency
- Risk of burden shifting
- Greenwashing
- Free riders
- Confusing

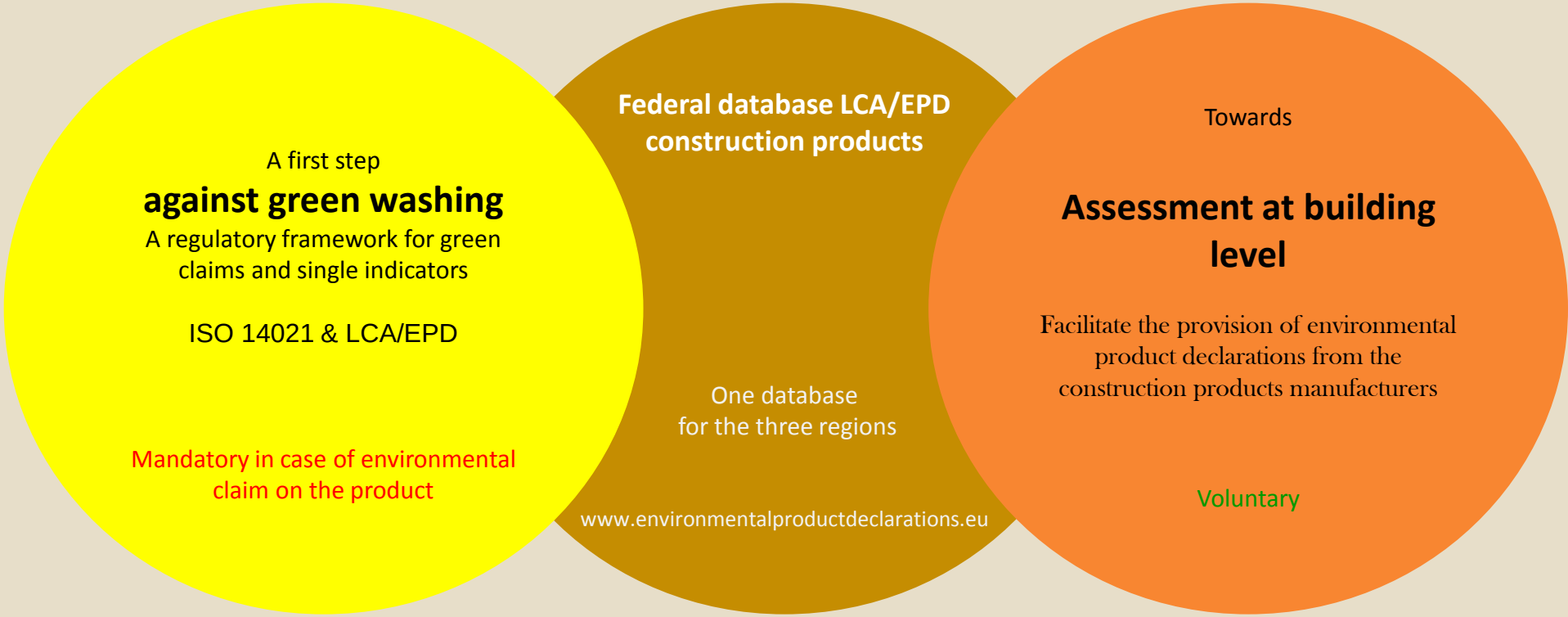
… to life cycle assessment …



&

Global warming	Acidification
Eutrophication	Abiotioc depletion
Tropospheric ozone formation	Impacts due to land use
Particulate matter	Ecotoxicity
Human toxicity	Water depletion

Summary of objectives Royal Decree:



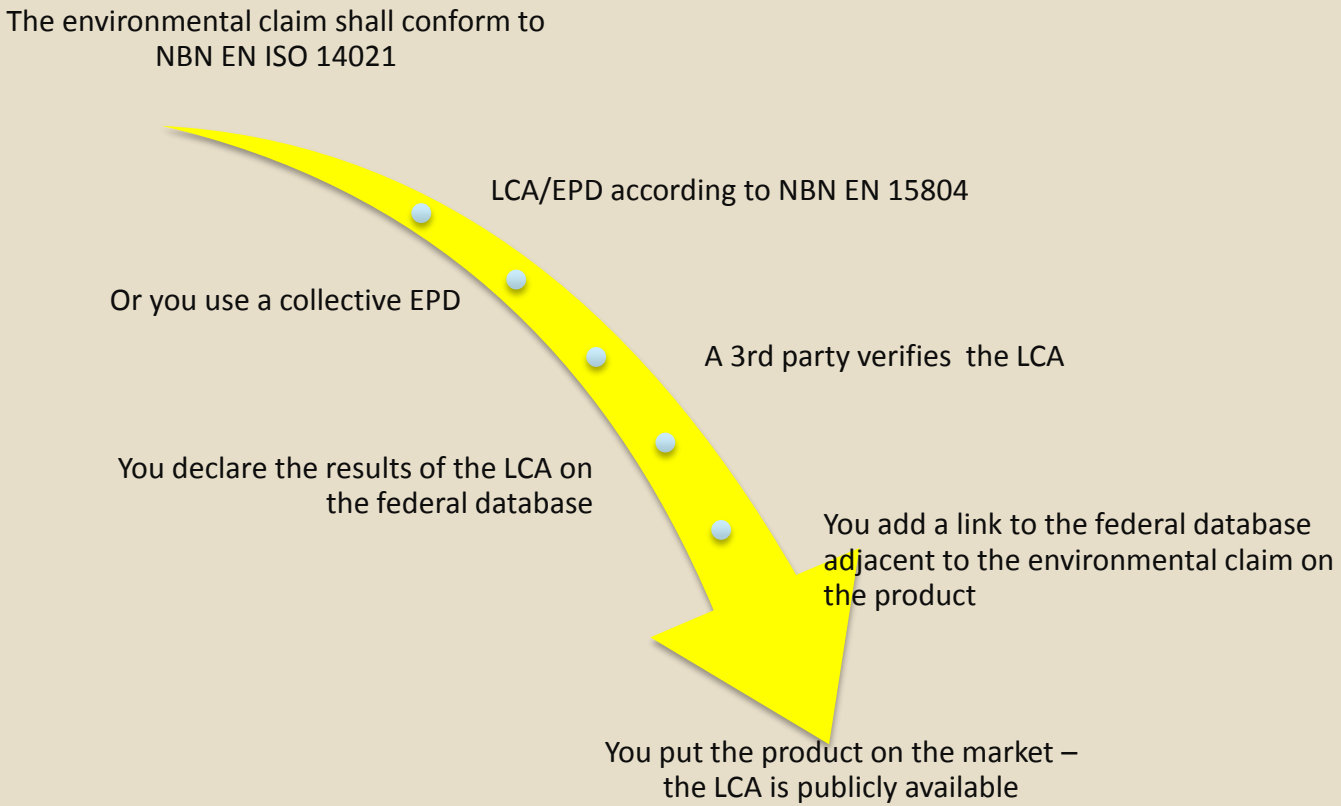
=
French decree

=
Dutch and German approach

ENV. BUILDING ASSESSMENT TOOL GEWESTEN

Royal Decree

If a manufacturer decides to put an environmental claim on his product



How should the LCA/EPD be established?

Who can verify?

How should it be verified?

Robustness / Quality / Transparency

- Royal decree:
  - conformity to NBN EN 15804 and EN ISO 14044.
  - Representative for the Belgian market.
  - Collective EPDs: representative for every individual manufacturer

- Currently under development:
  - **Product Category Rules** with a focus on the modules gate to grave
  - A platform for the development and validation of BE-PCR through standardization (finalizing business plan NBN)

- EPD EOL: either 100% scenario's or real calculated ones

- Total quality rating (TQR): preparatory study finished, needs to be implemented. A pragmatic approach for communicating the underlying data quality.
- FOD acts as program operator

!! NEW !!

How should the LCA/EPD be established?

Who can verify?

How should it be verified?

Robustness / Quality / Transparency

- **<u>Only accepted verifiers for the B-EPD Program</u>** (cfr. TQR)

- **Procedure for the acceptance of verifiers** almost finalized / preparatory study finished.

- Royal Decree: « the verifying person shall be an independent third party
  - Not involved in the execution of the LCA/EPD for that product
  - Knowledge and experience with the construction sector and its environmental impacts, the production processes and the execution of LCA.
  - Knowledge and experience with EN 15804, 14025, this royal decree, and if existing specific rules. »

How should the LCA/EPD be established?

Who can verify?

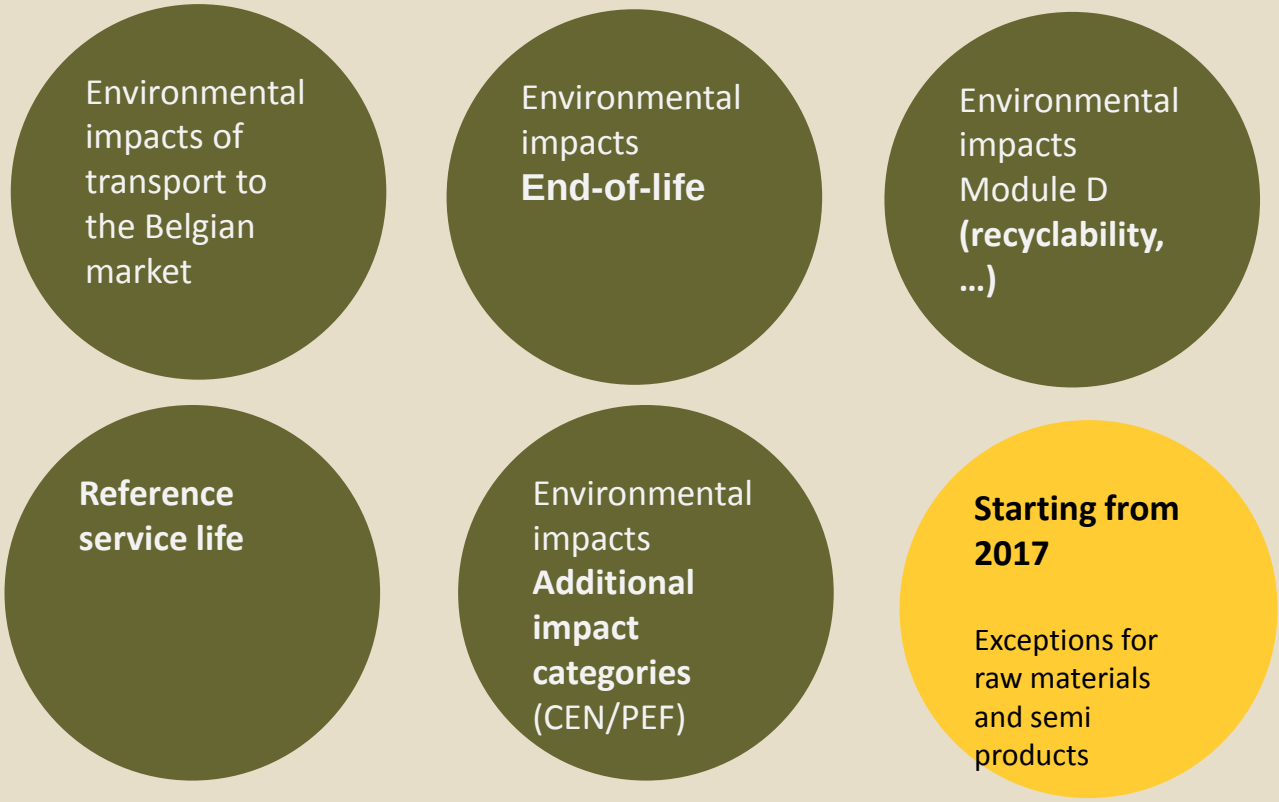
How should it be verified?

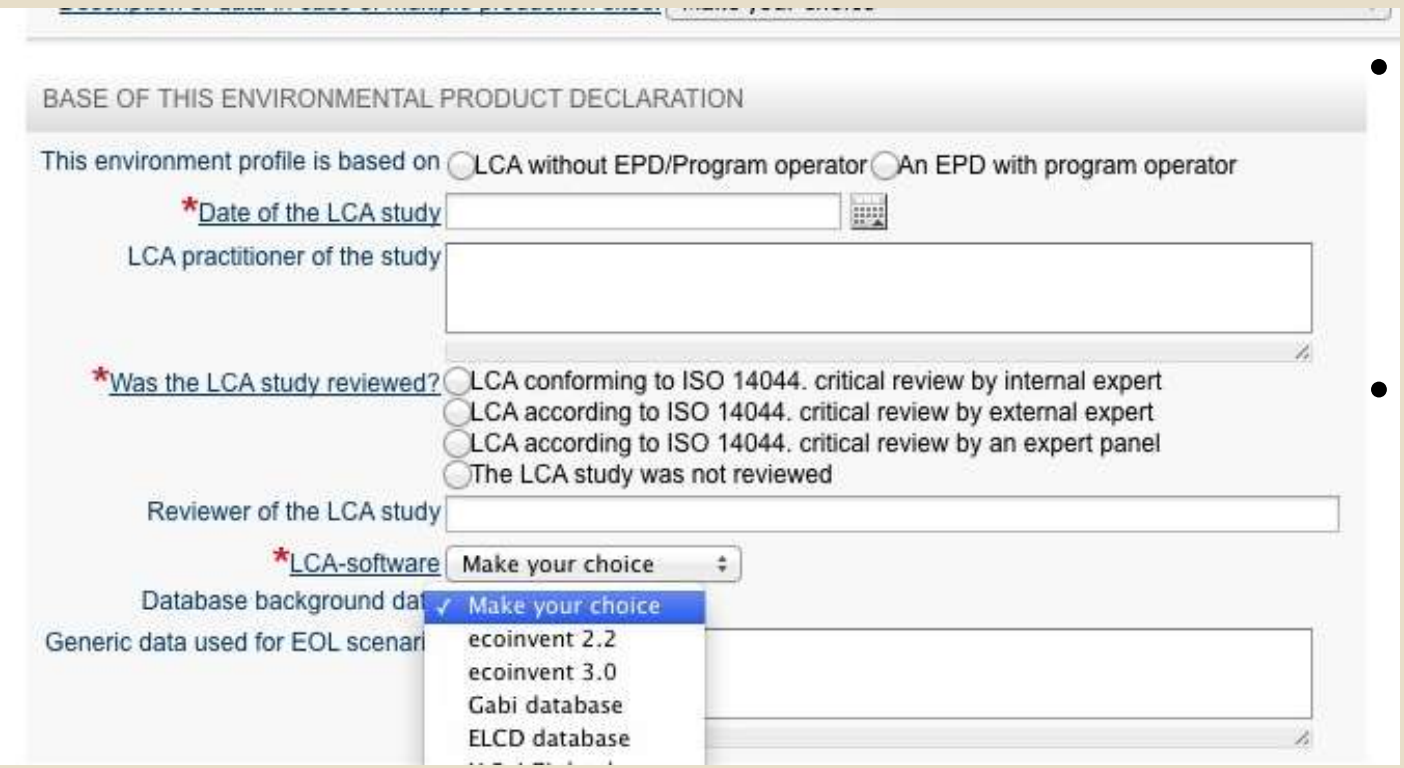
Robustness / Quality / Transparency

- Royal Decree:
  The verification shall include
  - the calculation rules in EN 15804 and EN ISO 14044
  - the justification of the RSL
  - The justification of the representativeness of the data
  - The representativeness of the data and scenario's for the Belgian market
  - Conformity to the Royal Decree

- Almost finalized: **a checklist for verification** / preparatory study finished.

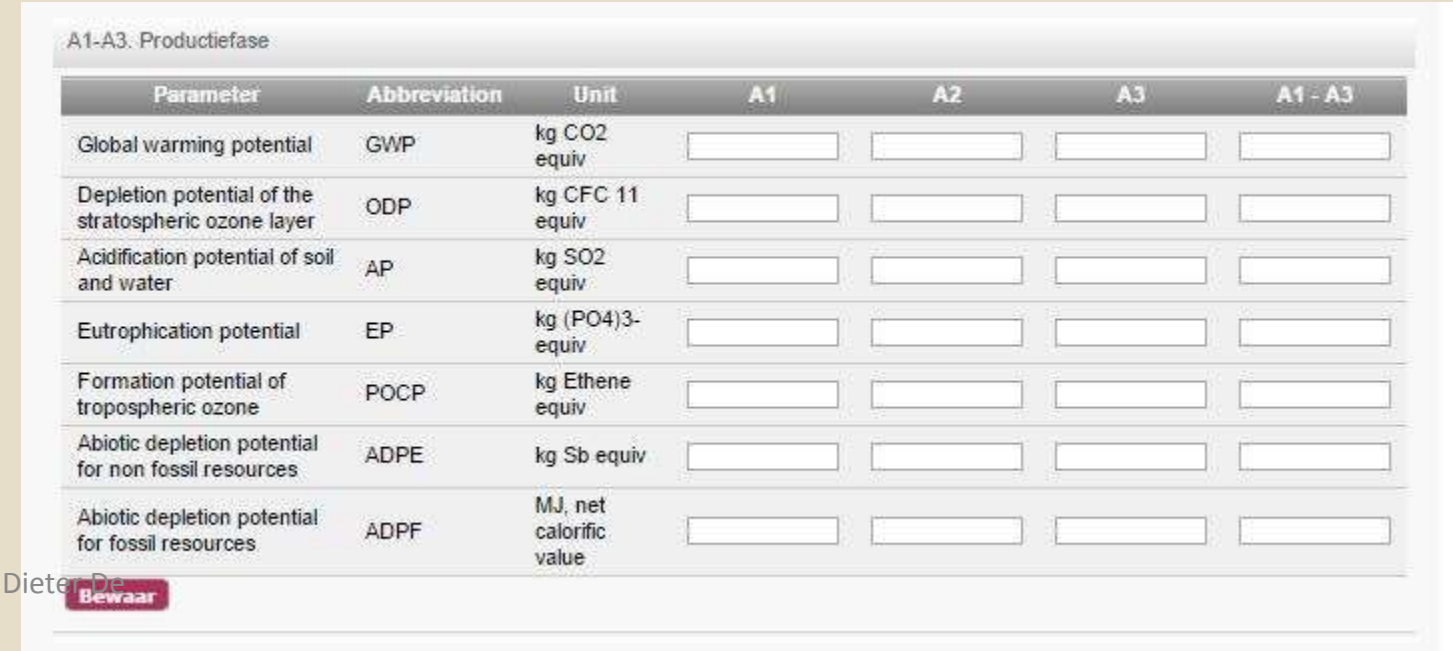
NBN EN 15804 + …

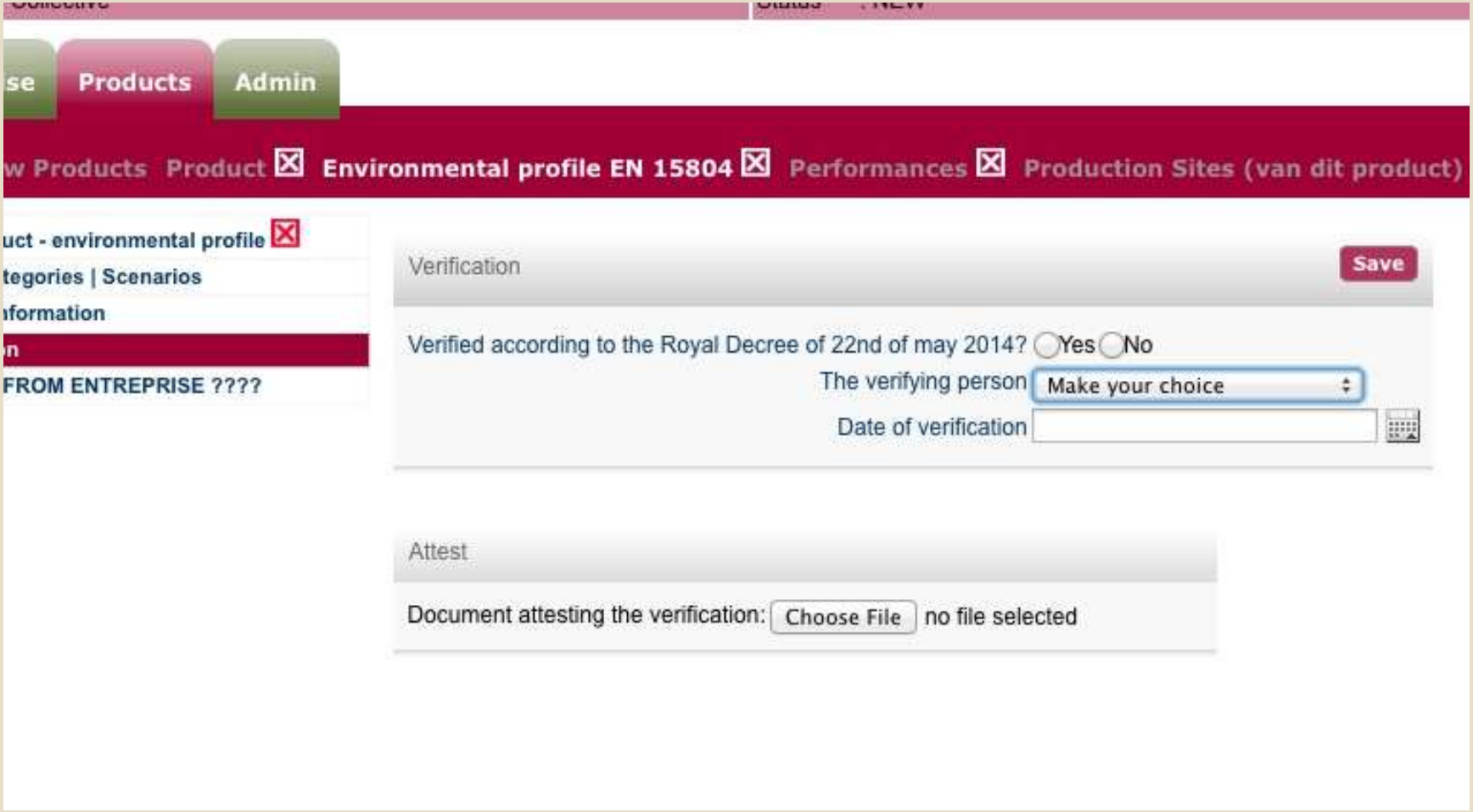

Environmental impacts of transport to the Belgian market
Environmental impacts **End-of-life**
Environmental impacts Module D **(recyclability, …)**
Reference service life
Environmental impacts **Additional impact categories** (CEN/PEF)
Starting from 2017
Exceptions for raw materials and semi products



- Publication by means of web format through B-EPD database
- One single federal database

- under development





+ possibility to declare technical characteristics

FEICA

MODEL EPD

- Question for compliance with the Royal Decree:
    - Art 3, The EPD shall be representative for the product made available on the Belgian market.
    - Quid possible additional indicators? Are the 3 indicators still a good proxy?
    - Not a real worst case.

- To be checked with the TQR implementation

- Main open question for understanding:
  - the establishment of the substance scores .
  - Get a view on how good the 3 indicators are a proxy

Belgian context

CONSTRUCTION PRODUCTS INDOOR AIR QUALITY

Indoor Air Quality is important

Federal Authorities

- Source control
- Royal Decree (8/5/2014) on maximum emission levels from construction products.
  - Limit values
  - Floor coverings, adhesives and finishing products for wooden floors (VOC, formaldehyde, …)
  - Preparing for walls and ceilings
  - Similar to AgBB

Regions

- Building level criteria
- Ventilation
- monitoring

LCA IMPORTANT ISSUES

Important issues for Belgium

Extend to all relevant environmental impact categories to avoid burden shifting

>> CEN TR + PEF

Enhance quality of background data >> TQR

Harmonization of

EPD-databases

Need for specific EPDs

Is GWP more or less important than resource depletion?

Weighting needed (at least at building level)

What is an acceptable environmental impact?

Benchmark needed

(at least at building level)

Get architects on board

If we have money and time, where to invest it in?

Roadmap + action plan to get all players on board with long term vision

Do we need to replace a product once or twice during the life of a building?

Service life

Belgian context

SUMMARY

Summary

LCA is the tool for assessing the impact of construction materials and products to avoid burden shifting

This should be done taking into account the building context

(product/building element/building)

Every quest for simplification should include a thorough reflection on perverse market effects and burden shifting

Belgium has published a decree regarding green claims and is developing a building assessment approach.

Federal Public Service will be program operator for the B-EPD program

Currently under development:

Database, verifier requirements, checklist, TQR

Thank you for your attention.

Dieter DE LATHAUWER

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