

Partnership with a glass wool producer for accurate LCA

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²KnaufInsulation



Knauf Insulation

MINERAL WOOL

Glass
Mineral
Wool



with **ECOSE**[®]
TECHNOLOGY

Rock
Mineral
Wool



WOOD WOOL

Heraklith[®]



Heradesign[®]



Extruded Polystyrene

Building sector

- Two levels of focus
 - Building as a whole
 - Product/system



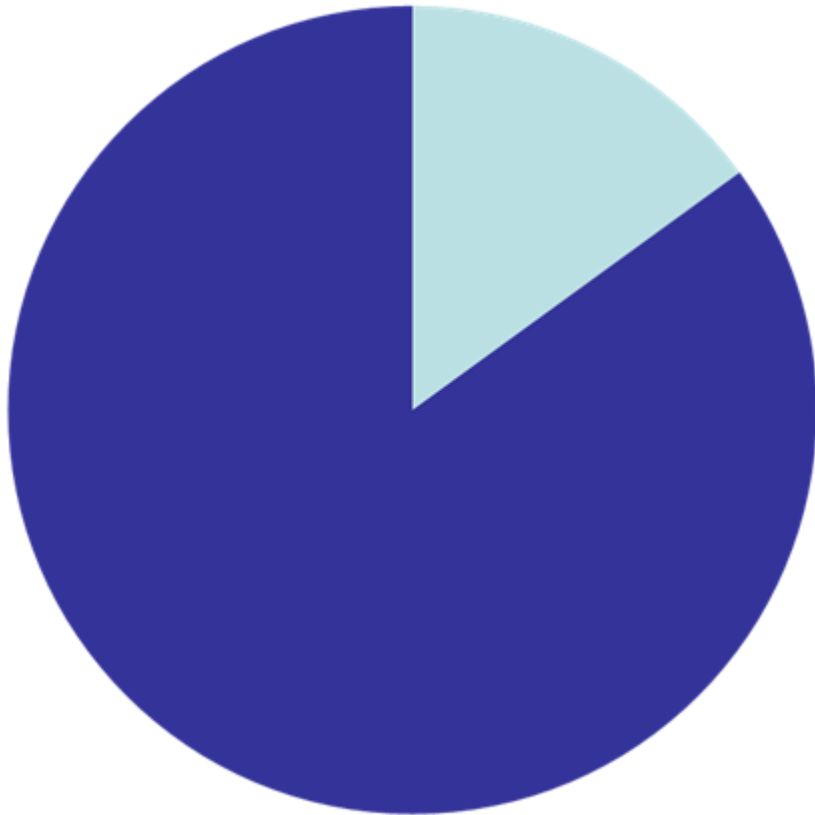
BREEAM®



<http://www.maison-passive-nice.fr/le-projet-nicois/le-permis-definitif/>

Evolution of the environmental impact

Year
2000



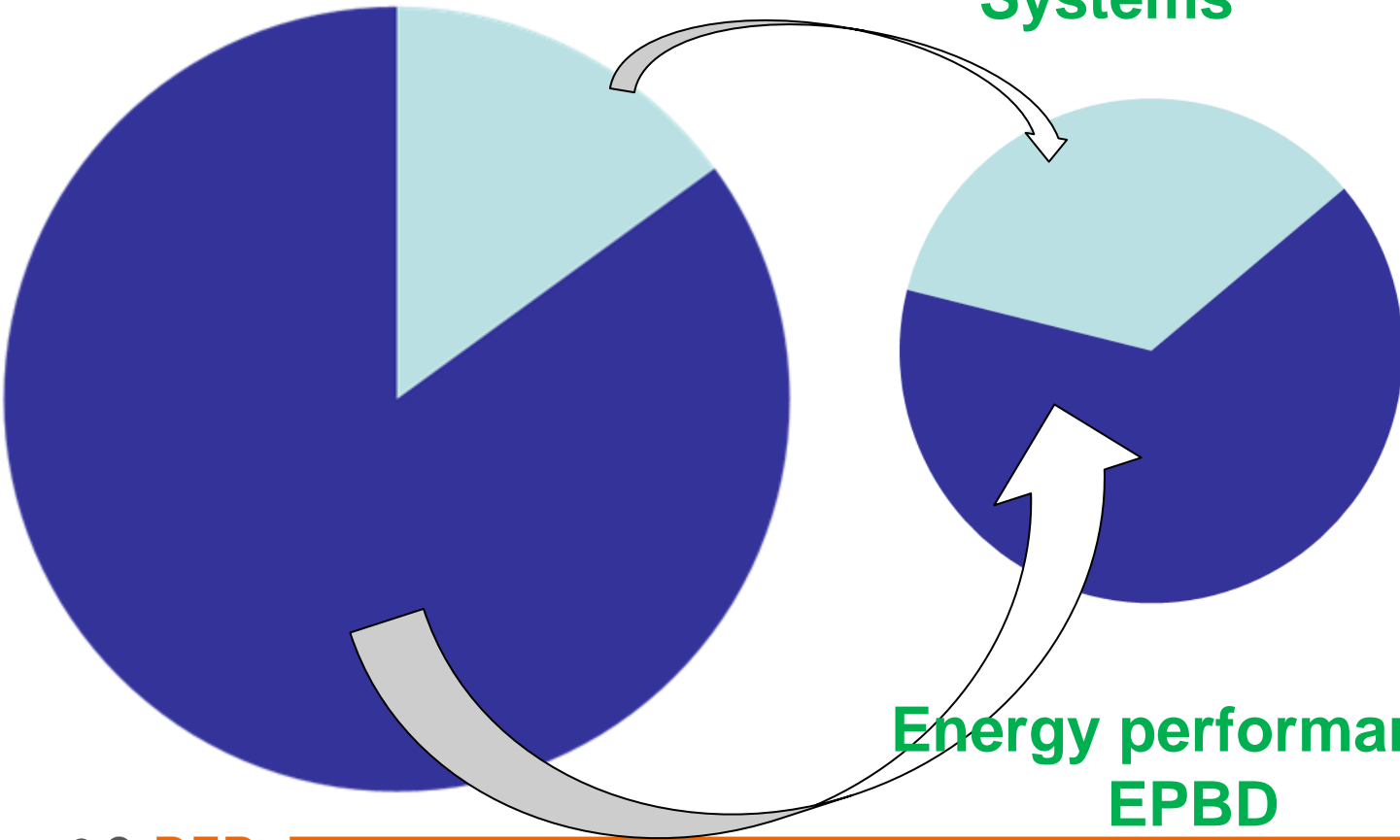
Materials
Use

Evolution of the environmental impact

Year
2000

2015-20

Sustainable Products and
Systems



Materials
Use

Energy performance
EPBD

Evolution of the environmental impact

Year
2000

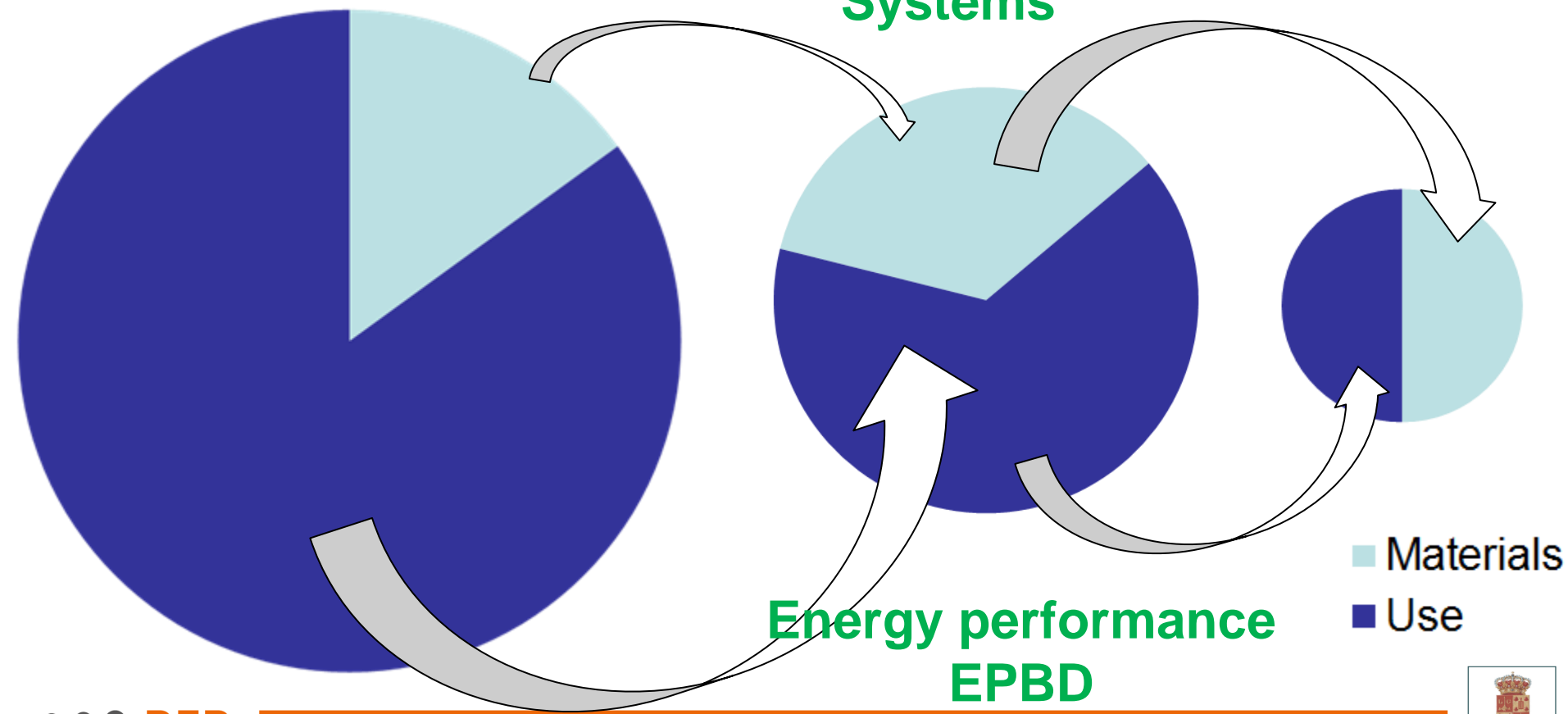
2015-20

2020+

Sustainable Products and
Systems

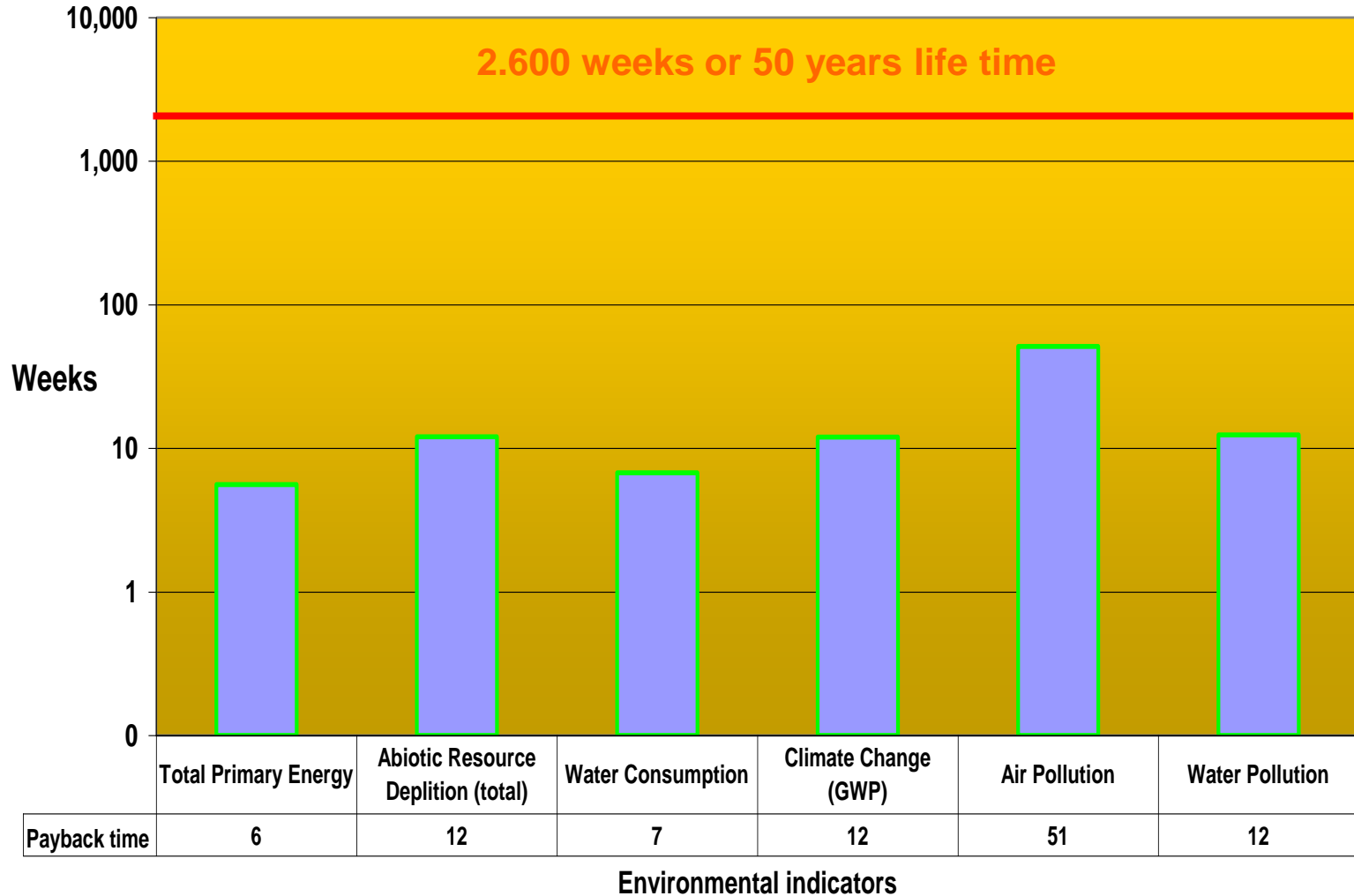
Energy performance
EPBD

Materials
Use



Use phase?

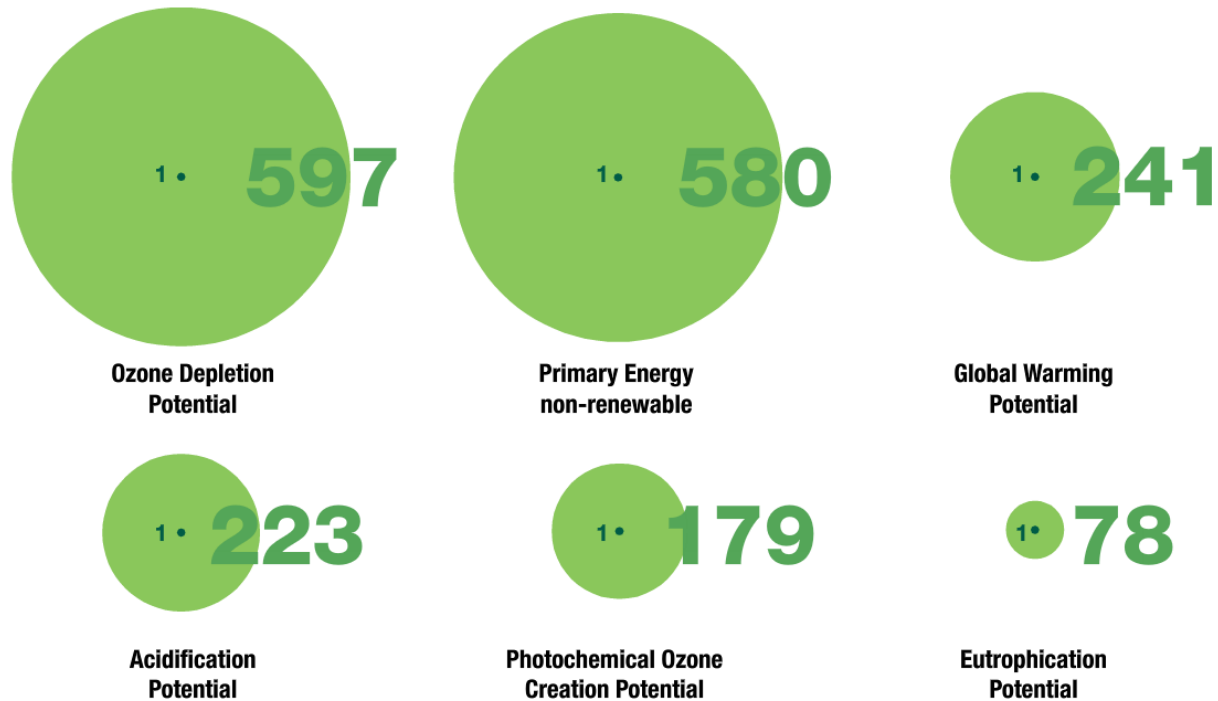
Environmental Payback Time
 Pitched roof in France insulated to the level of present regulation
 (Source: Knauf Insulation FDES 2010)



Use phase?

- Sources: Eurima
 - LCA with EN15804
 - Eurima mineral wool with R-value of 5 in roof and 3 in wall
 - Heating system: 50% gas – 50 % electricity
 - France (Strasbourg)

Ratios for energy related environmental impact indicators



● Environmental benefit through energy savings during 50 years use

● Environmental impact

Collaboration: First...

- Collaboration Knauf Insulation – ULg: from 2012
- Market demand for EPD



DECLARATION
ENVIRONNEMENTALE et SANITAIRE
CONFORME A LA NORME *NF P 01-010*

Acoustilaine 035 100 mm
Laine de verre

with **ECOSE** TECHNOLOGY

Janvier 2013
N° 09-293 : 2012

Cette déclaration est présentée selon le modèle de Fiche de Déclaration Environnementale et Sanitaire validé par l'AIMCC (FD&S Version 2005)



Umwelt-Produktdeklaration
nach ISO 14025



Holzwole-Mehrschichtplatten
mit Steinwollekern

Heraklith

Heraklith® is registered trademark of

KNAUF INSULATION

Deklarationsnummer
EPD-KN-2011711-D

Institut Bauen und Umwelt e. V.
www.bau-umwelt.com



Institut Bauen
und Umwelt e.V.



DECLARACIÓN AMBIENTAL DE PRODUCTO
DAPc® 001.006

PRODUCTO
**PANEL PLUS (TP 138)
de 100 mm**



EMPRESA

KNAUF INSULATION

DESCRIPCIÓN DEL PRODUCTO

Panel semi-rígido de Lana Mineral de Vidrio no hidrófila, sin revestimiento, de 100 mm de espesor nominal, 1.350 mm de longitud y 600 mm de anchura

DE ACUERDO CON LAS NORMAS
ISO 14.025 e ISO 21.930

RCP DE REFERENCIA

RCP001 - Productos aislantes térmicos - V.1 (2010)

PLANTA PRODUCCIÓN

KNAUF INSULATION LANNEMEZAN SAS
501, Voie Napoléon III
F-65300 Lannemezan (France)

VÁLIDEZ

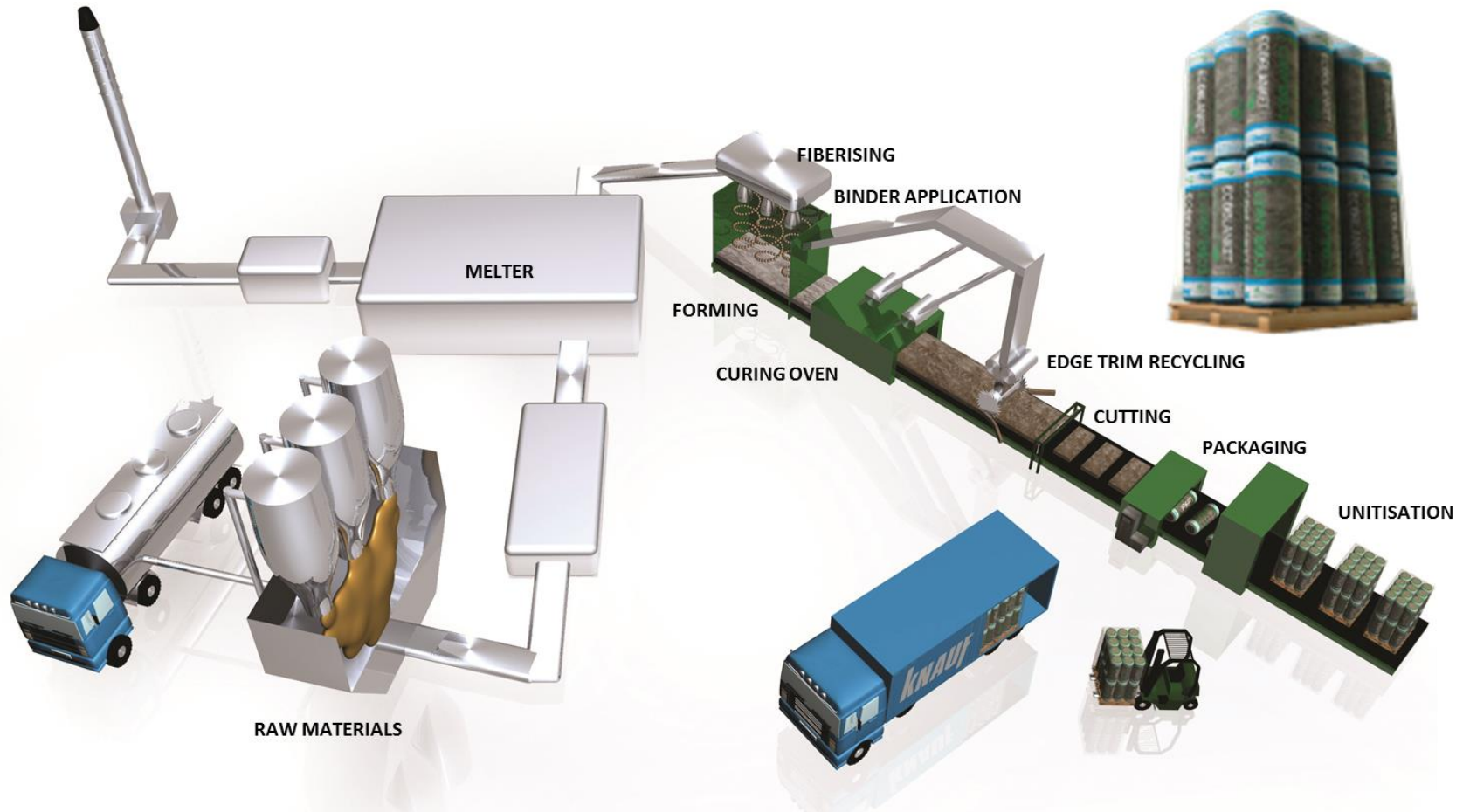
Desde: 31.01.2013
Hasta: 30.01.2018

La validez de la DAPc® 001.006 está sujeta a las condiciones del reglamento DAPc®. La edición vigente de esta DAPc® es la que figura en el registro que mantiene CAATEEB; a título informativo, se incorpora en la página web del Sistema <http://es.ecosystema.net/dapc>

Then...

- Need a more flexible tool
 - Quicker answer to market demand
 - Eco-Conception
- Development of a model for glass mineral wool products
 - Developed at ULg
 - User friendly

Glass mineral wool production



- General operation principle: identical in all plants

PEPs

CHEMICAL
ENGINEERING

KNAUFINSULATION

Modeling

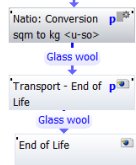
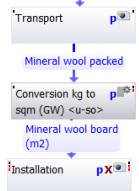
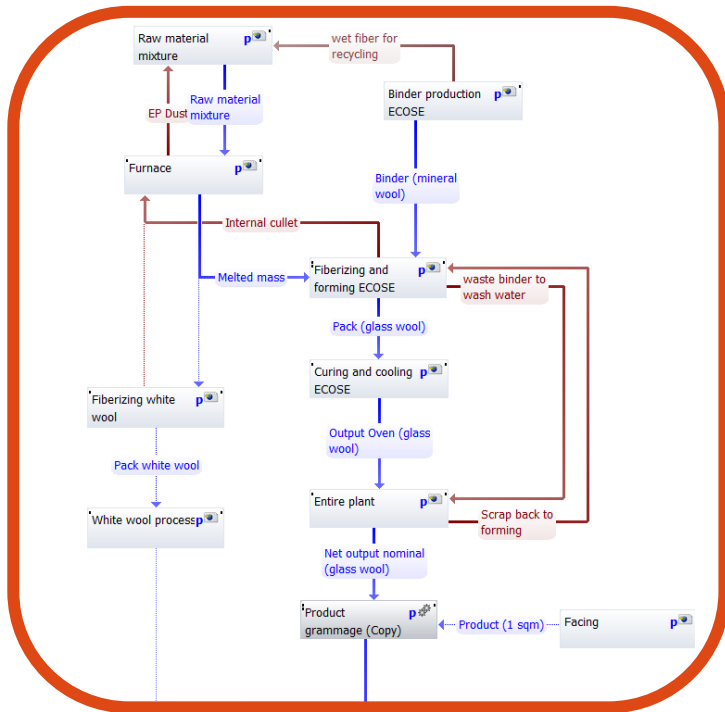


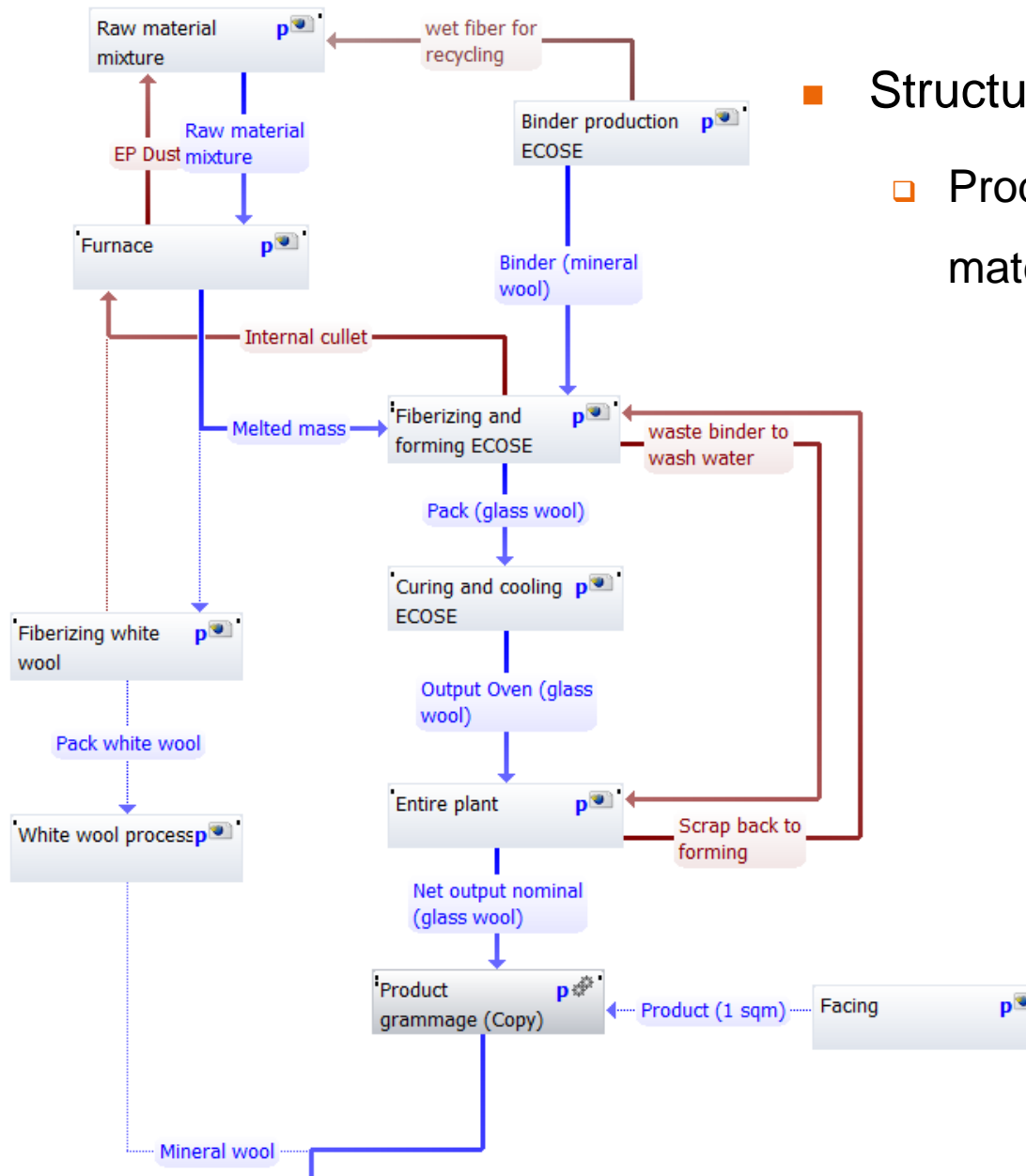
thinkstep
GaBi

- General operation principle: identical in all plants
- A unique model
- Structured // plant organization
- In GaBi 6
 - Plans of different levels
 - In a plan: other plans or processes
 - Flow to link plans and/or processes

Modeling - unique model

- Structured // plant organization





- Structured // plant organization
 - Product flow and recycled materials

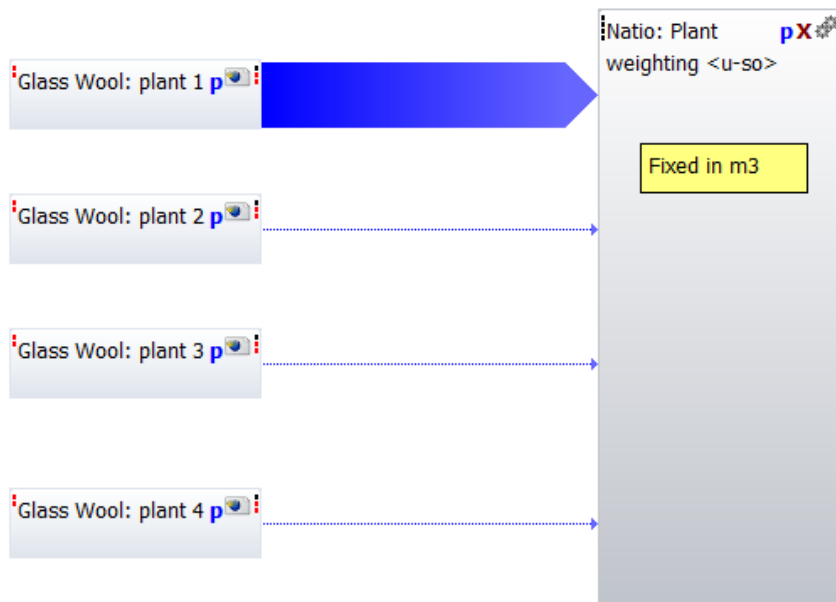
Modeling

- Combination of factories possible

1. Plant weighting: glass wool product - KNAUF INSULATION

Plan du procédé GaBi: Mass [kg]

p



Modeling

- Parameters:
 - Amount of each raw material
 - Transport distance
 - Energy consumption
 - Origin of energy
 - Amount of waste/co-product
 - **Plant parameters**
- Example: the raw material mixture plan parameters

Modeling

- Parameters: Define the product characteristics
 - Dimension
 - Type (blowing wool/ wool)
 - Density
 - Facing used
 - Packaging used
 - Production plant
- **Product parameters**

Modeling

- Product parameters
- Plant parameters
- **Model allows to study every products from all production plants (or combination)!**

Advantages

- Be able to study every products from all production plants (or combination)
 - EPD: EN15804
 - Quicker
 - Easier
- Simplify the data collection
- Be able to make detailed analyze: Use LCA as a multi-criteria tool!
 - Eco-design

Multi-criteria?

- Why?
 - Avoid impact transfer from one impact categories to another
- First:
 - Only focus on PEF indicators and focus on these that « seem » important:
 - GWP
 - Energy
 - ...

Multi-criteria? Then...



- Knauf Insulation has developed this owned binder
 - Free of formaldehyde → indoor air quality!
 - Biobased → Environment?
- Need a better understanding of this binder
- PhD
- More systematic evaluation of the impact categories
 - Use of normalization and weighting to have a better understanding of the environmental impact

Challenges

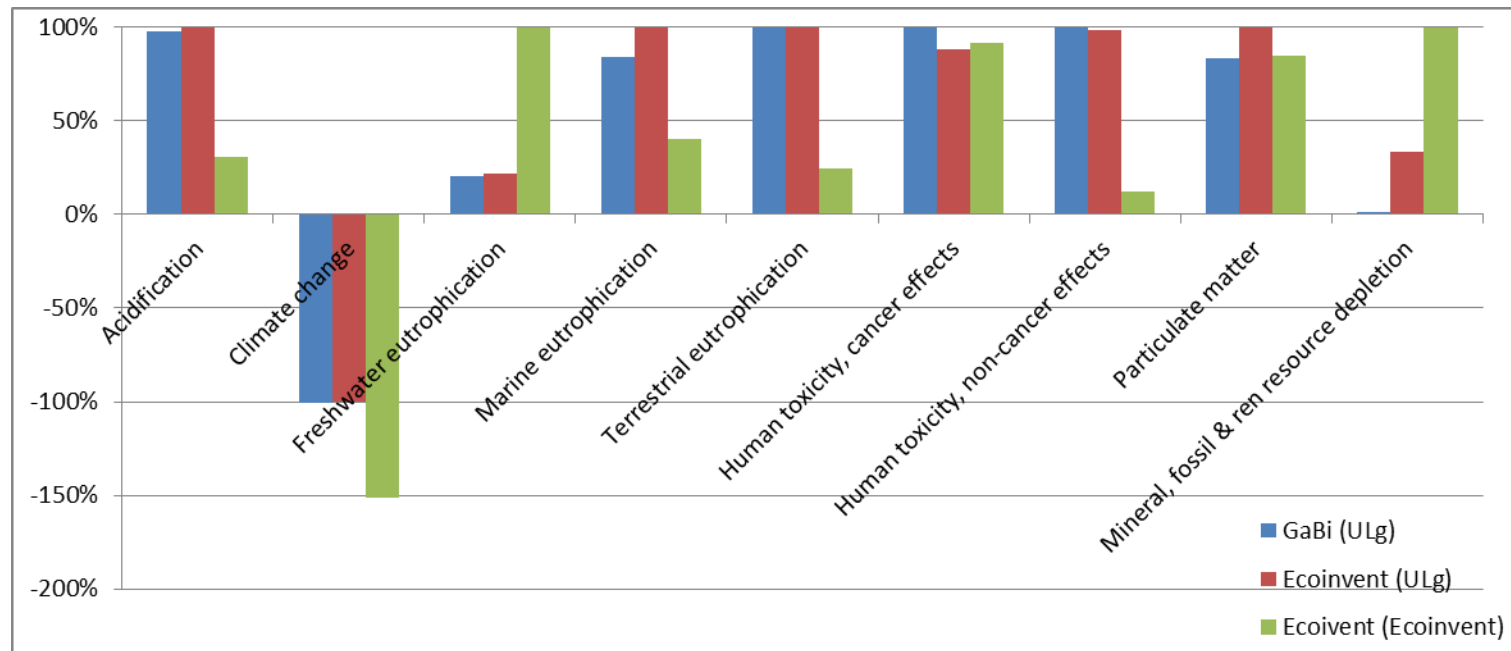
- Better characterization of the binder
- Good understanding of its applications to allow comparison
 - Glass wool
 - Stone wool
 - Wood panels

Agriculture data?

- Belgian (Wallonia) data from CRA-W (fertilizer, transport processes, etc.) with
 - GaBi database
 - Ecoinvent database
- Ecoinvent European dataset for corn/wheat
- Influence on the results?

ECOSE main component

- Influence of the data? And the databases?



Conclusions

- Environmental benefits thanks to energy saving in the use phase
- More efforts on production phase
- Starting from EPDs to respond to market demand for building evaluation... Understanding:
 - Need more detailed analyses
 - Ecodesign
 - LCA as multicriteria
 - Need more researches on specific topic: ECOSE
- Bridging the gaps between research and industry: win-win relation

Thank you for your attention

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