

Lowering the environmental impact of buildings

The key role of Environmental Product Declarations (EPD)



EmiratesGBC Technical Workshop

Dorian Bomble

Saint-Gobain

19/11/2019



AGENDA

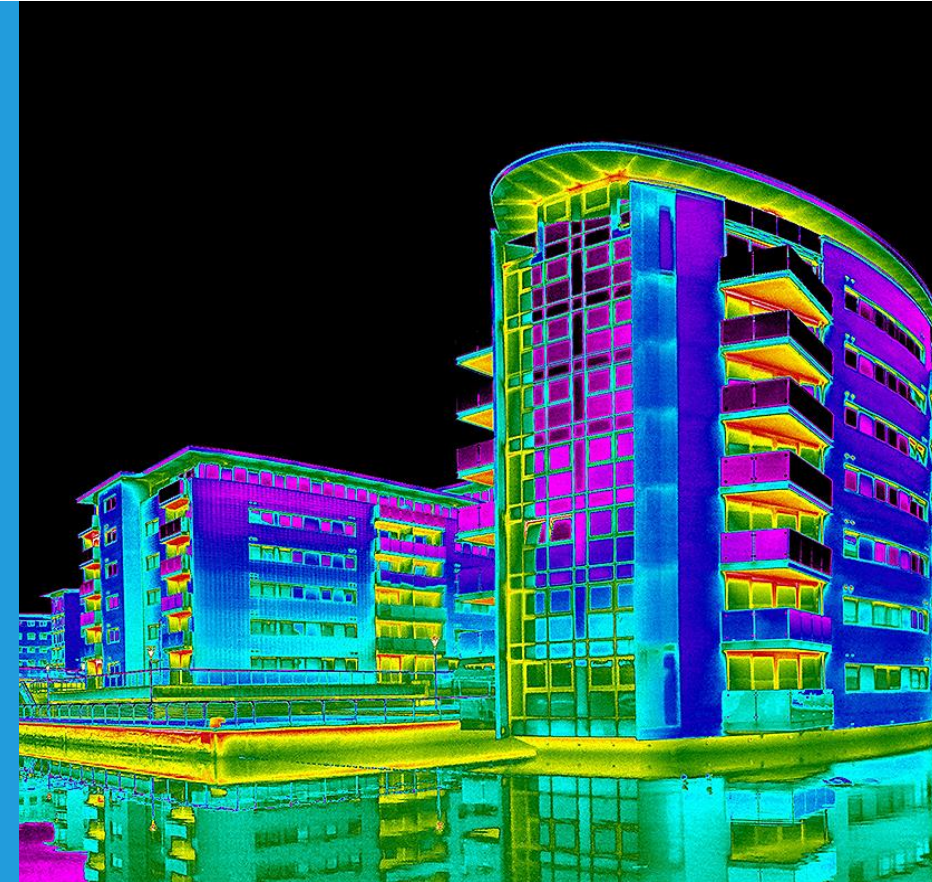
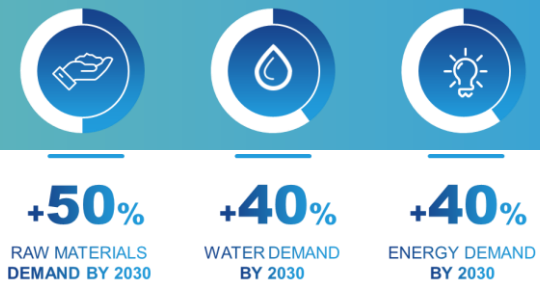
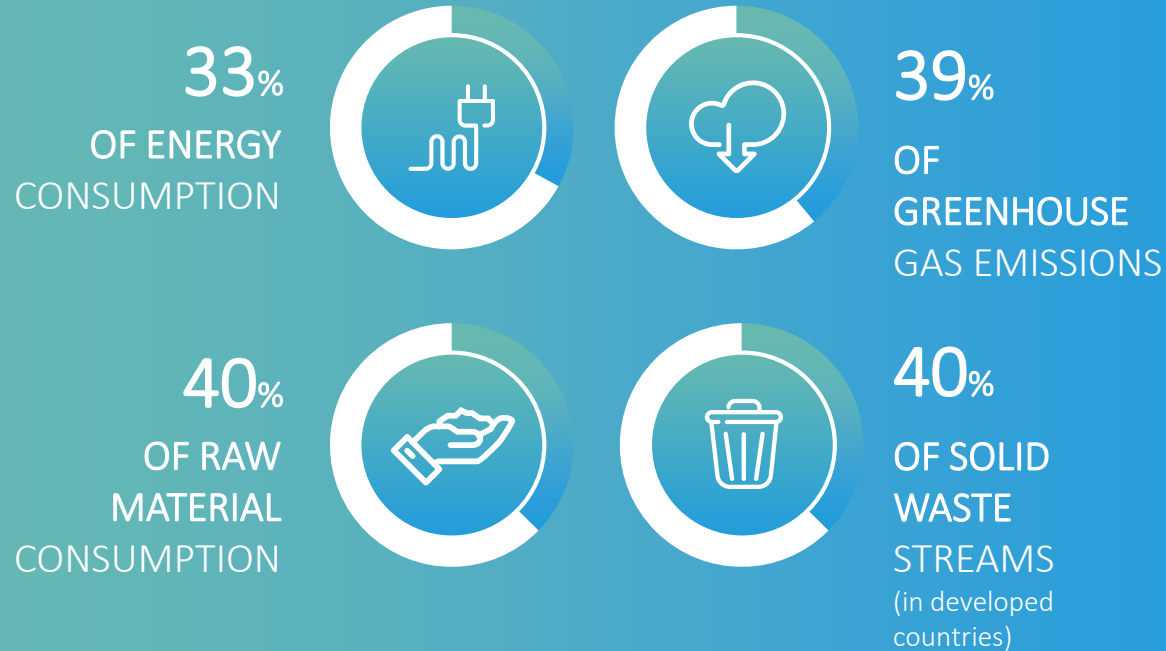


- 1- Why measuring our environmental impact is so important?
- 2- Life cycle assessment (LCA)
- 3- Environmental product declaration (EPD)
- 4- LEED v4 sections and requirements
- 5- Other important product transparency documents
- 6 - Game



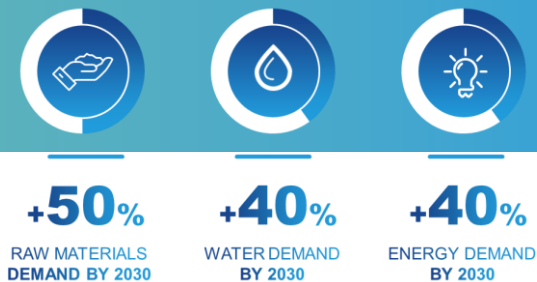
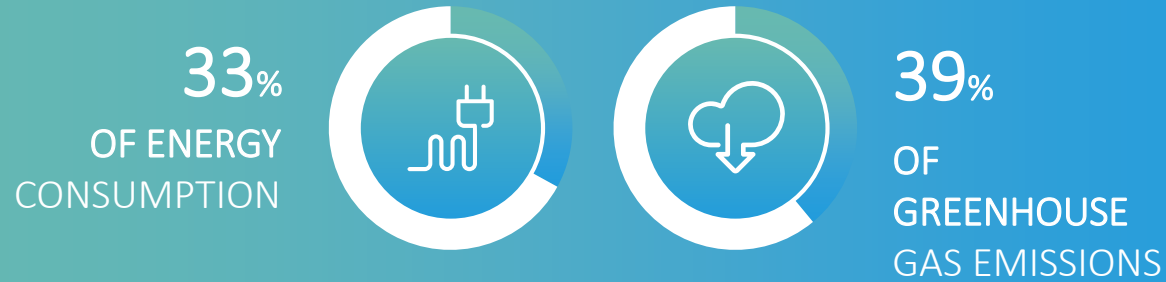
1- Why measuring our environmental impact is so important?

Because THE CONSTRUCTION SECTOR HAS A HUGE IMPACT on the environment...

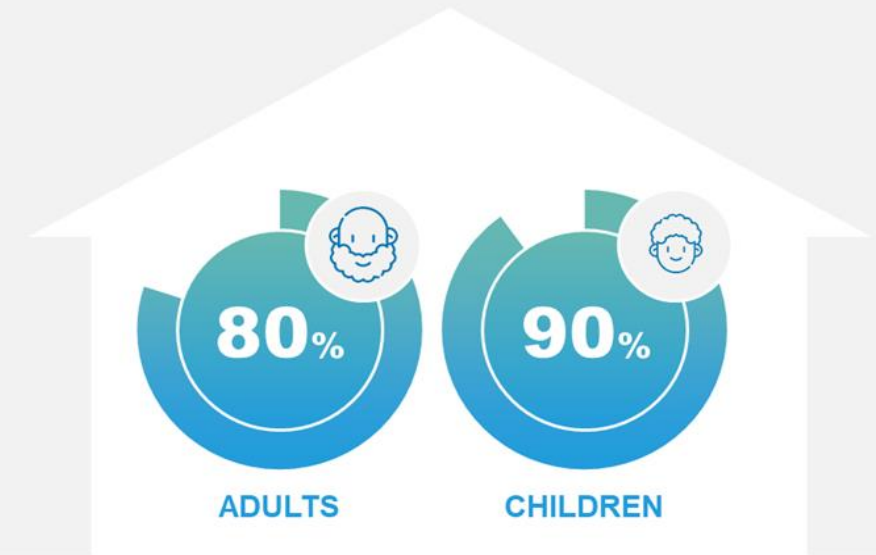


1- Why measuring our environmental impact is so important?

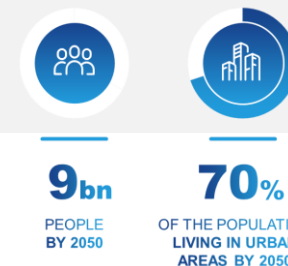
...and on people's health & wellbeing



As per WHO*
Time spent indoors

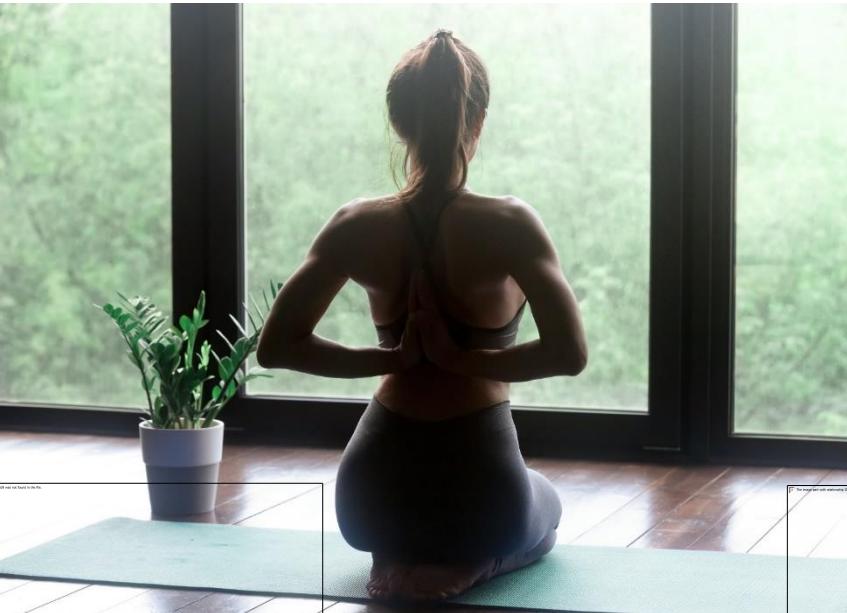


*World Health Organization



1- Why measuring our environmental impact is so important?

3 major sustainability challenges for the construction markets



HEALTH & WELLBEING



TOWARDS ZERO CARBON



CIRCULAR
ECONOMY

1- Why measuring our environmental impact is so important?

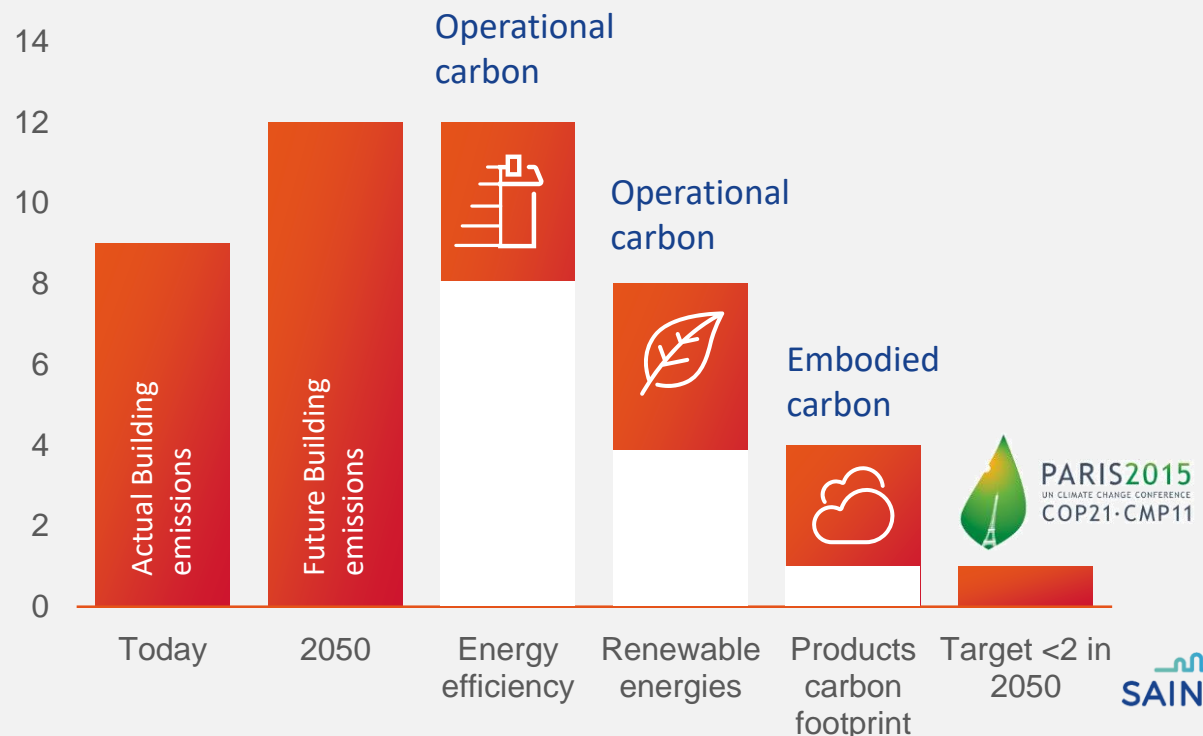
First Step Towards zero carbon buildings



- Zero or positive energy new constructions
- Deep energy renovations of existing buildings
- Renewable energies
- Low carbon materials & systems

NEED TO REDUCE CARBON EMISSION AT ALL STAGES

2050 OUTLOOK (IEA figures)



1- Why measuring our environmental impact is so important?

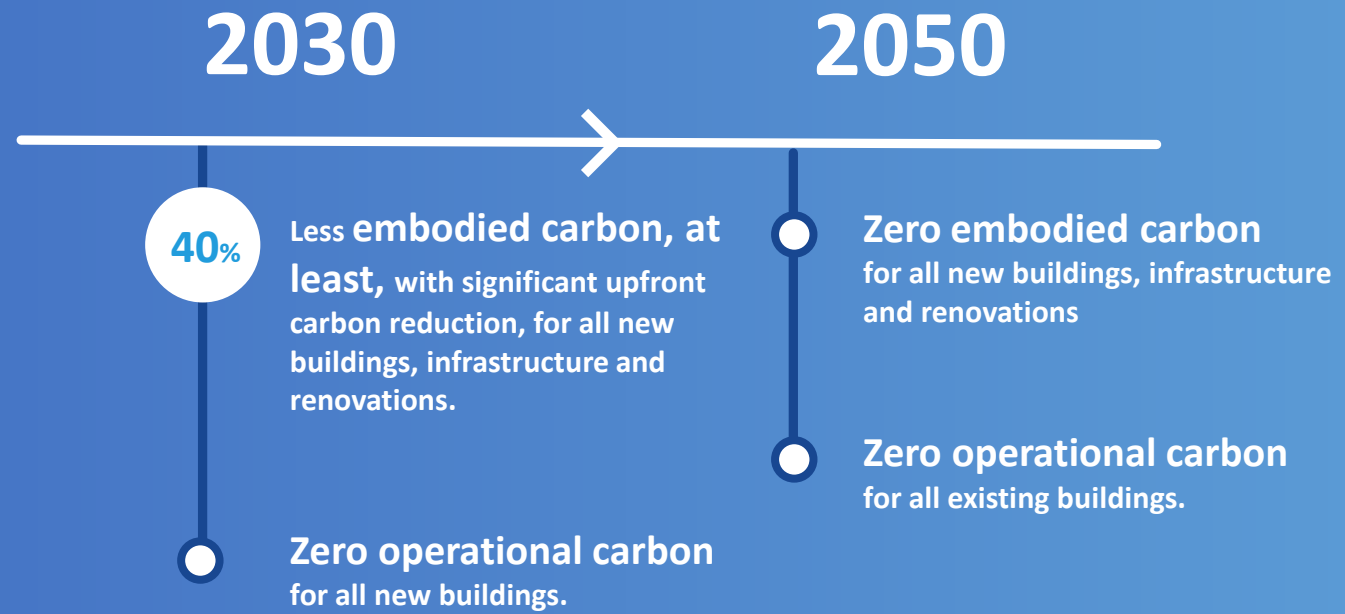
New zero embodied carbon target for new buildings in 2050

Bringing embodied carbon upfront

Coordinated action for the building and construction sector to tackle embodied carbon



VISION : FOCUS ON EMBODIED CARBON



1- Why measuring our environmental impact is so important?

QUIZ : What does the planet Earth prefer? (level 1)



1- Why measuring our environmental impact is so important?

QUIZ : What does the planet Earth prefer? (level 1)



1- Why measuring our environmental impact is so important?

QUIZ : What does the planet Earth prefer? (level 1)



1- Why measuring our environmental impact is so important?

QUIZ : What does the planet Earth prefer? (level 2)



1- Why measuring our environmental impact is so important?

QUIZ : What does the planet Earth prefer? (level 2)



1- Why measuring our environmental impact is so important?

Comparing the Global warming potential of different products (in kg CO₂ equivalent)



| Products | kg CO ₂ | Source |
|--|--------------------|------------------|
| glass wool: 1m ² mineral wool with R = 1 | 0,87 | ISOVER do Brazil |
| 4 x vanilla yogurts – 500 g | 1,57 | Casino |
| 6 x meat saussages Knacks (x6) – 210 g | 1,9 | Casino |
| Plasterboard: 1 m² of Placo® BA13 - 12,5mm | 1,93 | PLACO France |
| 1 kg of chicken | 3 | Eco2Initiative |
| 1 pair of jeans | 5,51 | Deloitte |
| 1 kg of beef | 18 | Eco2Initiative |
| Computer + LCD screen | 1280 | ADEME |
| Commuting 10 km per day between residence and work | 1300 | Eco2Initiative |

Source of Brazilian ISOVER EPD:

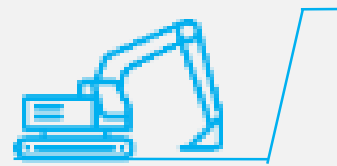
<https://gryphon4.environdec.com/system/data/files/6/12339/epd964%20SG%20Isover%20Feltro%20Wallfelt%20Pop%204%202016.pdf>

1- Why measuring our environmental impact is so important?

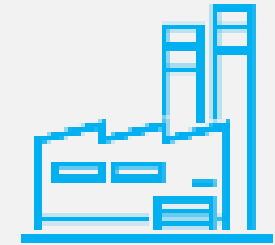
Several parameters for several environmental impacts



- Energy efficiency
- Low carbon energies & Renewables
- Low carbon raw materials & recycled content
- Product design



Raw materials



Industrial processes



Transportation



End of life

1- Why measuring our environmental impact is so important?

Several parameters for several environmental impacts

INPUTS

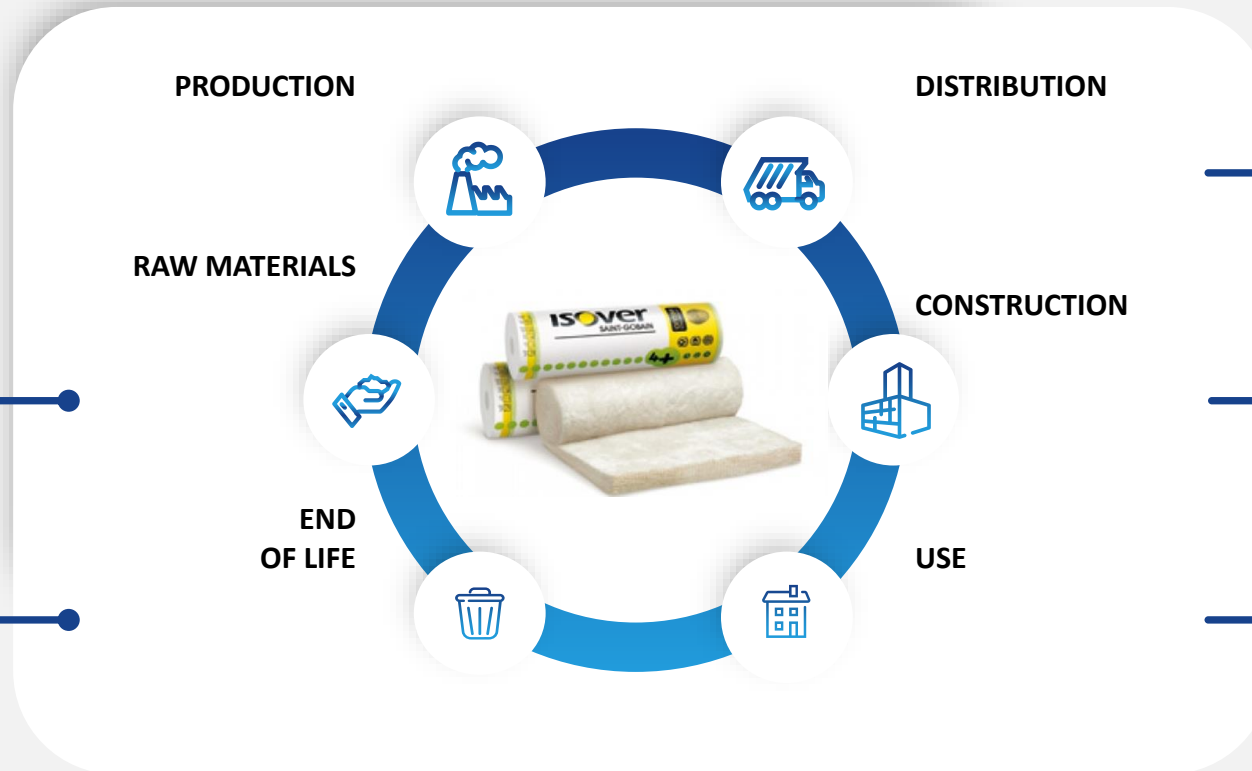
OUTPUTS

IMPACTS

Resources depletion

Renewable resources

Non renewables resources



Emissions to air

Emissions to water

Emissions to soil

IMPACTS

Global warming

Air acidification

Water pollution

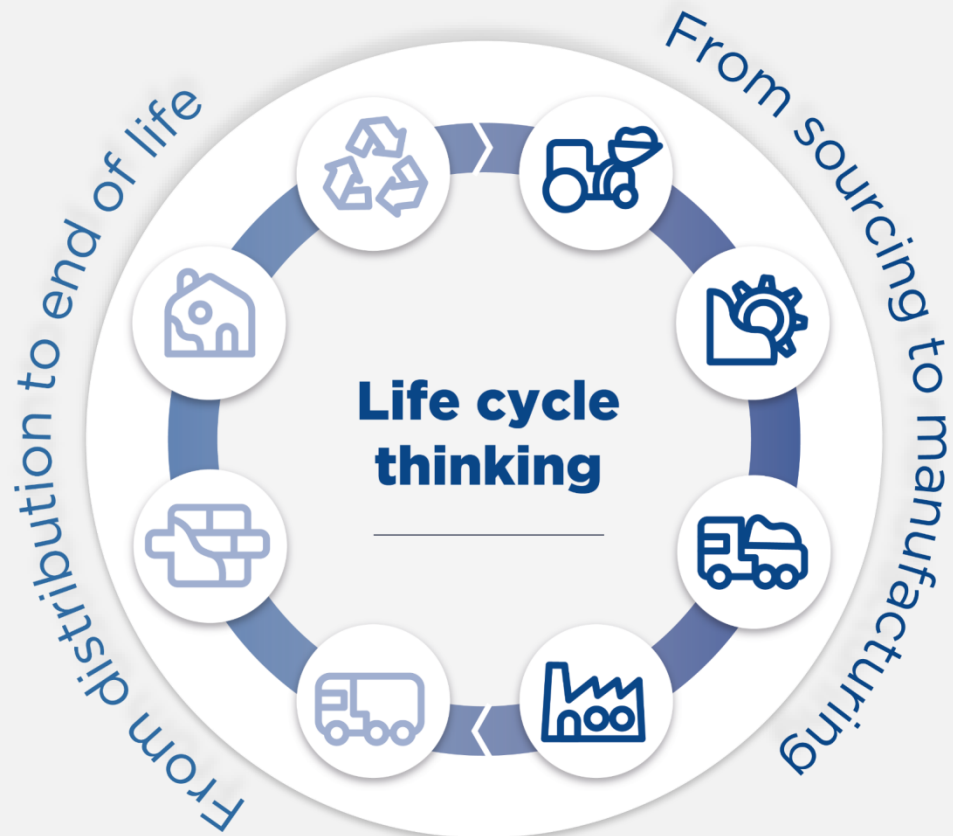
Human and ecosystems toxicity

...



All products generate impacts
To know the impact → LCA (Life Cycle Assessment)

2- Life cycle assessment (LCA)



What is an LCA
(Life Cycle
Assessment)?

2- Life cycle assessment (LCA)

Why choosing LCA ?

- ✓ More than **400 product eco-labels** exist on the market
- ✓ Consumers get confused and loose trust and confidence in these labels



2- Life cycle assessment (LCA)

LCA is a science based methodology to **evaluate the environmental performance of a product** throughout all stages of its life cycle



Multi steps
(life cycle perspective)



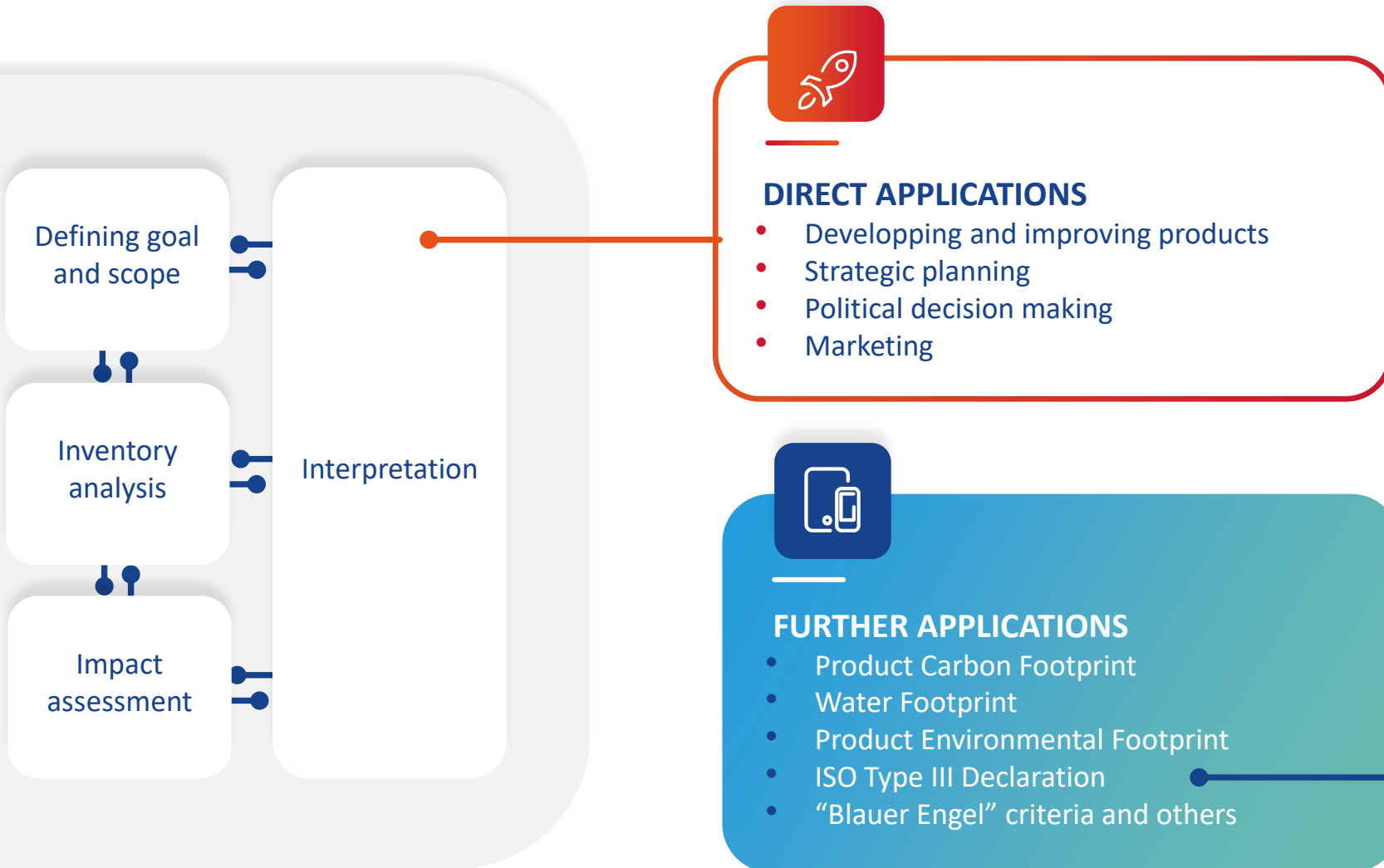
Multi criteria
(covers a broad range of environmental issue)



Quantitative values

2- Life cycle assessment (LCA)

Life Cycle Assessment according to ISO 14040 & ISO 14044



ISO 14025 – ISO 21930 – EN 15804

2- Life cycle assessment (LCA)

The full life cycle in Saint-Gobain LCA



FROM CRADLE...



...TO GRAVE

2- Life cycle assessment (LCA)

Indicators in LCA

**NOT ONLY
CARBON
FOOTPRINT :**



GWP

Global Warming Potential

Unit :
kg CO2 eq.



EP

Eutrophication Potential

Unit :
kg (PO4)3 eq.



AP

Acidification Potential

Unit :
kg SO2 eq.



ODP

Ozone depletion Potential

Unit :
kg CFC11 eq.



POPC

Photochemical Potential

Unit :
kg (PO4)3 eq.



ADP-e

Abiotic depletion for non-fossil resources

Unit : MJ



ADP-f

Abiotic depletion for fossil resources

Unit : MJ



Use of renewable primary energy excluding renewable primary energy resources used as raw materials

Unit : MJ



Use of renewable primary resources used as raw materials

Unit : MJ



Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials

Unit : MJ



Use of non-renewable primary energy resources used as raw materials

Unit : MJ



Use of secondary materials

Unit : kg



Use of renewable secondary fuels

Unit : MJ



Use of non-renewable secondary fuels

Unit : MJ



Net use of fresh water

Unit : m3



Components for re-use

Unit : kg



Materials for recycling

Unit : kg



Materials for energy recovery

Unit : kg



Exported energy

Unit : kg



Hazardous waste disposed

Unit : kg



Hazardous waste disposed

Unit : kg



Radioactive waste disposed

Unit :
kg SO2 eq.

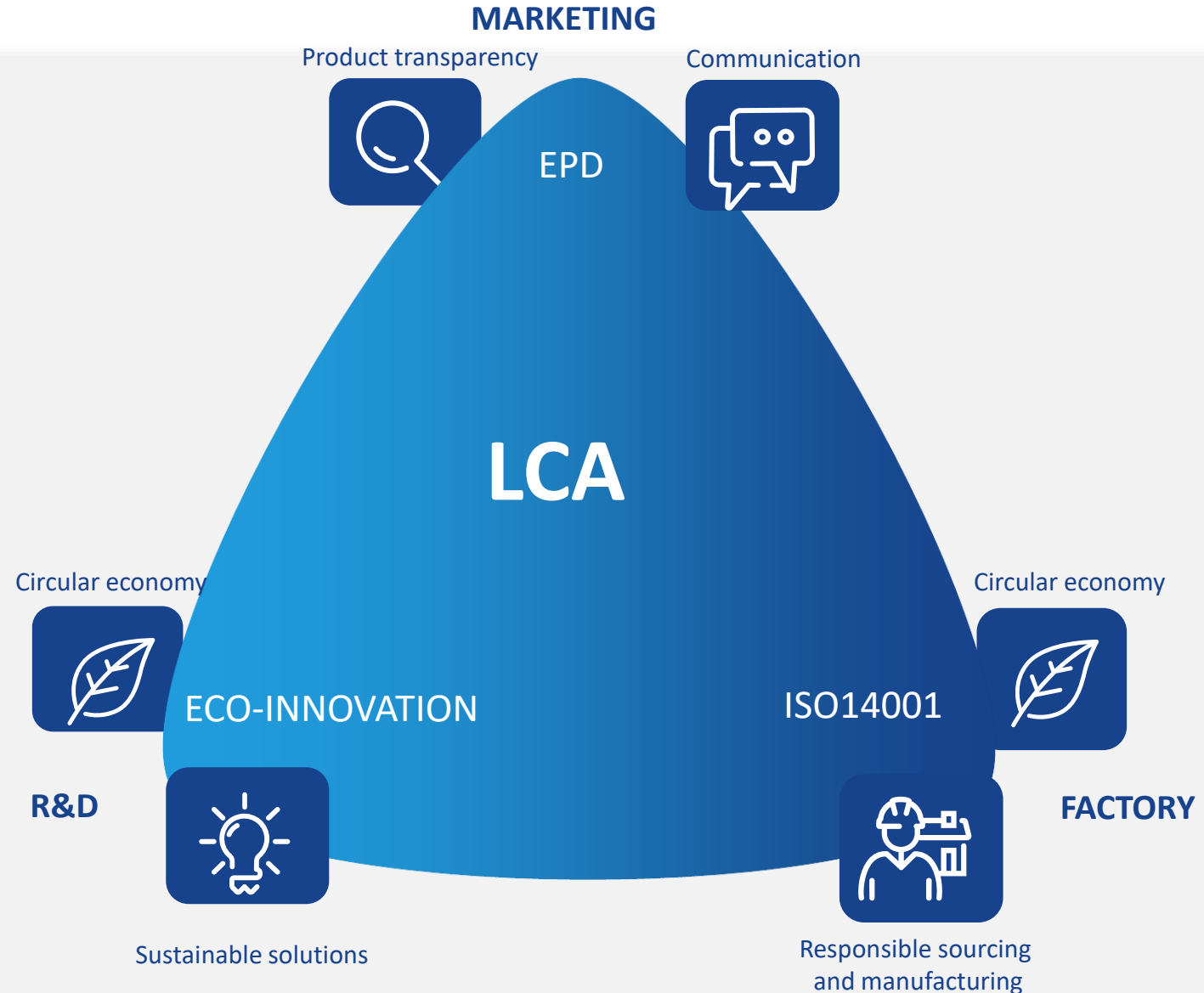
2- Life cycle assessment (LCA)



THE USE OF LCA

2- Life cycle assessment (LCA)

The connection of LCA with different departments for manufacturers



3- Environmental product declaration (EPD)



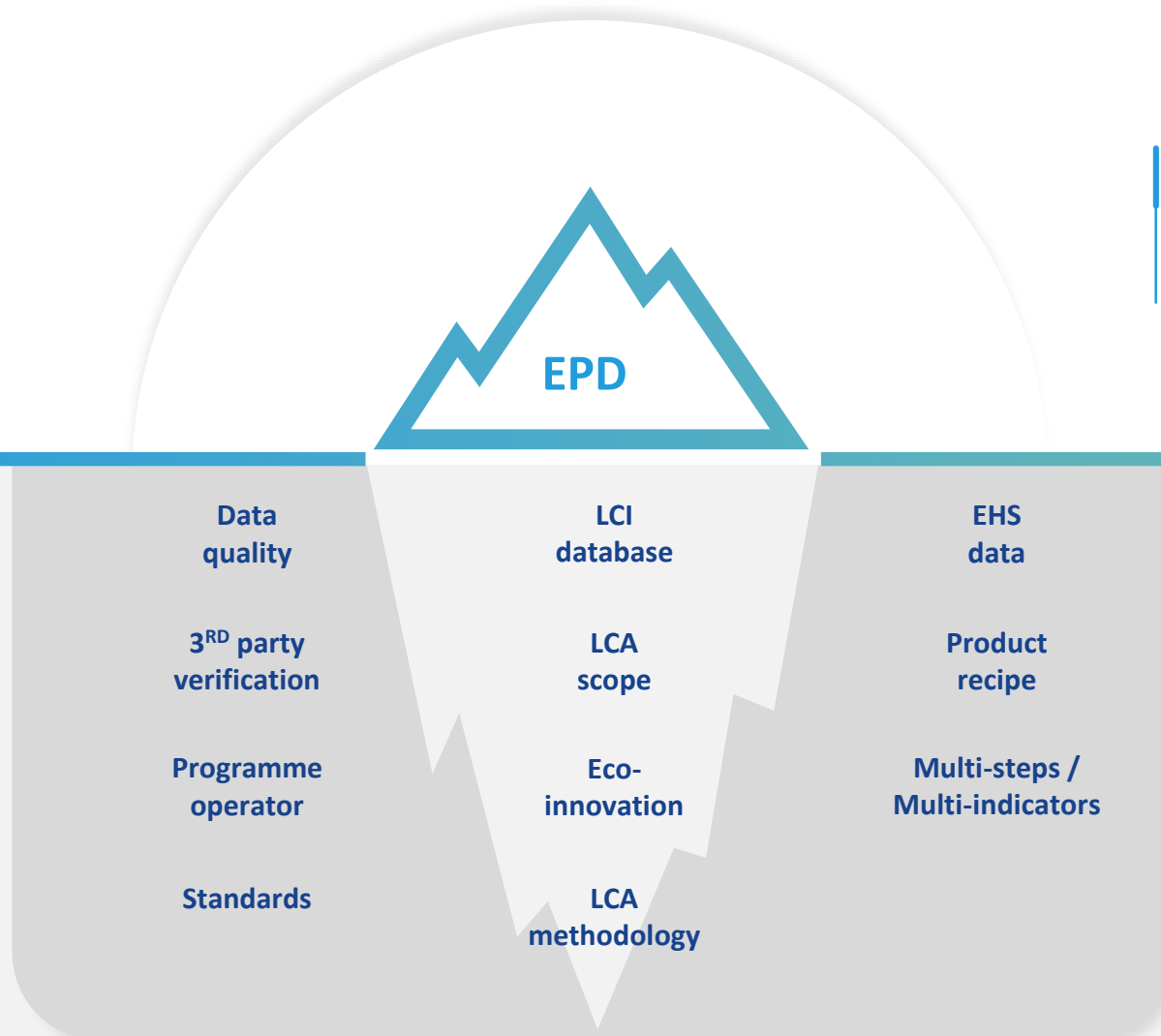
THE EPD (environmental
product declaration)

3- Environmental product declaration (EPD)

EPD is only the visible part of an iceberg



EPD is a document that includes the **LCA Results**.



3- Environmental product declaration (EPD)

EPD Content – Main sections



General information

Manufacturer: Saint-Gobain Denmark A/S, Gyproc
 Programme used: International EPD System <http://www.epdcenter.com/>
 EPD registration number/declaration number: S-P-20432
 PCR identification: EN 15804 Sustainability of construction works – Environmental product declaration - core rules for the product category of construction product and The International EPD System PCR 2012:01 version 2.2 for Construction products and Construction services
 Site of manufacturer: Kuldurberg (Hørsmøllevej 12, DK-4400 Kuldurberg)
 Owner of the declaration: Saint-Gobain Denmark A/S, Gyproc
 Product / product family name and manufacturer representative: plasterboard
 EN CPC code: 37020: articles of plaster or of composition based on plaster
 Revision date: 2018-03-31
 Valid until: 2023-07-31
 Demonstration of verification: an independent verification of the declaration was made, according to ISO 14025:2010. The verification was external and conducted by the following third party: Andrew Norton, Republics, based on the PCR mentioned above
 EPD Prepared by: Central TEAM, Saint-Gobain Gyproc.
 Contact: Main Delivery from Gyproc Saint-Gobain Denmark A/S (Main.Delivery@stgdn.gyproc.com) and Patricia Jørgensen Data from Gyproc and insulation LCA central team (Patricia.Jorgensen@stgdn.gyproc.com)
 The declared unit is 1 m² of installed building plasterboard of 9.5 mm thickness, with 7.20 kg/m² of weight and 757.8 kg/m³ of density and with a specified function and an expected average service life of 50 years.
 Declaration of Hazardous substances (Candidate list of Substances of Very High Concern): none
 Environmental management systems in place at site: ISO 14001 - N° DK007354-1
 Health and safety management systems in place at site: OHSAS18001:2008 - DK007352-1
 Quality management systems in place at site: ISO 9001:2015 - DK007350-1
 Geographical scope of the EPD(s): Denmark
 PCR: EN 15804
 PCR 2012:01 Construction products and Construction services, Version 2.2
 The Technical Committee of the International EPD System, Chair: Massimo Marino, Contact.Lca.rdg@enverdis.com
 PCR review was conducted by:
 Third party verified:
 Andrew Norton, Republics <http://www.republics.co.uk>
 Accredited or approved by:
 The International EPD System

Product description

Product description and use:
 The Environmental Product Declaration (EPD) describes the environmental impacts of 1 m² installed building plasterboard of 9.5 mm thickness, with 7.20 kg/m² of weight and 757.8 kg/m³ of density and with a specified function and an expected average service life of 50 years.
 Gyproc Vindtæt is made up of a gypsum core (a blend of Fine Gypsum Desulphurated Gypsum (DGS), recycled gypsum and natural gypsum) with additives and paper liner.
 Gyproc Vindtæt is a plasterboard for sheathing applications where wind-proofing, high air tightness and low vapour resistance is required. The gypsum core provides enhanced moisture resistance and the surface has a water-repellent treatment to prevent water from penetrating into the core. The board is not designed to be permanently exposed to external weather conditions. It is estimated to withstand up to 2 months' exposure in a humid climate before the facade material is installed. The exposure time will depend on the weather conditions at the site. Larger exposure time of use is when subject to heavy driving rain is not recommended and other products within the Gyproc sheathing family should be used in such cases. It is 9.5 mm thick, available in 100 mm (GUE 9) and 1200 mm width (GU 9).
 Technical dataphysical characteristics:

| EN CLASSIFICATION | ENH |
|-------------------------|-----------------------------|
| ACCLIMATION TO FINE | EN 15804-1:2002 |
| WATER VAPOUR RESISTANCE | 10 µ (EN 12524:2000) |
| THERMAL CONDUCTIVITY | 0.25 W/(mK) (EN 12524:2000) |

 Description of the main components and/or materials for 1 m² of product for the calculation of the EPD(s):

| PARAMETER | VALUE |
|---|---|
| Quantity of plaster for 1 m ² of product | 7.20 kg |
| Thickness | 9.5 mm |
| Surface | Paper: 180 g/m ² |
| Packaging for the transportation and distribution | Polystyrene film: 0.0843 kg/m ² Gypsum core: 0.22 kg/m ² Gypsum core: 0.00953 kg/m ² |
| Product used for the installation | None |

 During the life cycle of the product any hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" has not been used in a percentage higher than 0.1% of the weight of the product.
 The verifier and the programme operator do not make any claim nor have any responsibility of the legality of the product.

Life cycle stages

Flow diagram of the Life Cycle



Product stage: A1.A3
 Description of the stage: the product stage of plaster products is subdivided into 3 modules A1.A2 and A3 respectively "Raw material supply", "transport to manufacturer" and "manufacturing".
 A1, raw material supply:
 This includes the extraction and processing of all raw materials and energy which occur upstream from the manufacturing process.
 A2, transport to the manufacturer:
 The raw materials are transported to the manufacturing site. The modelling includes road, boat and/or train transportation of each raw material.
 A3, manufacturing:
 This module includes the manufacture of products and the manufacture of packaging. The production of packaging material is taken into account at this stage. The processing of any waste arising from the stage is also included.

| Parameters | Product weight | Construction process stage | ENVIRONMENTAL IMPACTS | | | | | | | | | | | | | | | | | | | | |
|---|----------------|----------------------------|--|---|---|--|---|---|--|--|---|---|--|---|---|---|---|---|---|----------|----------|----------|----------|
| | | | Global warming potential (GWP 100) - kg CO ₂ e/m ² PCU | Acid equivalent potential (APE) - kg SO ₂ e/m ² PCU | Abiotic depletion potential (ADP) - kg Sb eq/m ² PCU | Abiotic depletion potential for fossil resources (ADP-fossil) - kg oil eq/m ² PCU | Abiotic depletion potential for non-fossil resources (ADP-non-fossil) - kg Sb eq/m ² PCU | Photochemical ozone creation (PCO) - kg O ₃ e/m ² PCU | Respiration potential (RP) - kg CO ₂ e/m ² PCU | Global warming potential (GWP 100) - kg CO ₂ e/m ² PCU | Acid equivalent potential (APE) - kg SO ₂ e/m ² PCU | Abiotic depletion potential (ADP) - kg Sb eq/m ² PCU | Abiotic depletion potential for fossil resources (ADP-fossil) - kg oil eq/m ² PCU | Abiotic depletion potential for non-fossil resources (ADP-non-fossil) - kg Sb eq/m ² PCU | | | | | | | | | |
| Global Warming Potential (GWP 100) - kg CO ₂ e/m ² PCU | 2,350.00 | 1,806.01 | 1,806.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4,358.02 | 3,791.02 | 1,326.01 | 3,336.02 |
| Acid Equivalent Potential (APE) - kg SO ₂ e/m ² PCU | 2,805.00 | 2,105.04 | 1,485.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,333.04 | 1,235.04 | 1,326.01 | 1,376.13 |
| Abiotic depletion potential (ADP) - kg Sb eq/m ² PCU | 0,205.03 | 1,505.03 | 7,085.04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,336.04 | 4,085.04 | 7,046.04 | 5,236.04 |
| Abiotic depletion potential for fossil resources (ADP-fossil) - kg oil eq/m ² PCU | 5,005.00 | 2,685.04 | 3,085.04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,715.04 | 6,685.04 | 1,308.04 | 2,885.04 |
| Abiotic depletion potential for non-fossil resources (ADP-non-fossil) - kg Sb eq/m ² PCU | 4,005.04 | 2,335.04 | 1,785.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,985.04 | 2,345.01 | 5,385.01 | 2,485.01 |
| Photochemical ozone creation (PCO) - kg O ₃ e/m ² PCU | 0,005.00 | 0,005.00 | 0,005.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,005.00 | 0,005.00 | 0,005.00 | 0,005.00 |
| Respiration potential (RP) - kg CO ₂ e/m ² PCU | 0,705.00 | 2,805.00 | 2,805.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,685.01 | 5,085.01 | 1,885.00 | 3,335.01 |

Main mandatory information (Based on EN 15804):



General information



Product description



LCA calculation information



Life cycle stages description



LCA results as environmental impacts...

3- Environmental product declaration (EPD)

EPD Content – Environmental impacts indicators

Environmental impacts indicators based :






Declared or Functional unit considered for the LCA study



Stages considered : cradle to gate, cradle to grave...

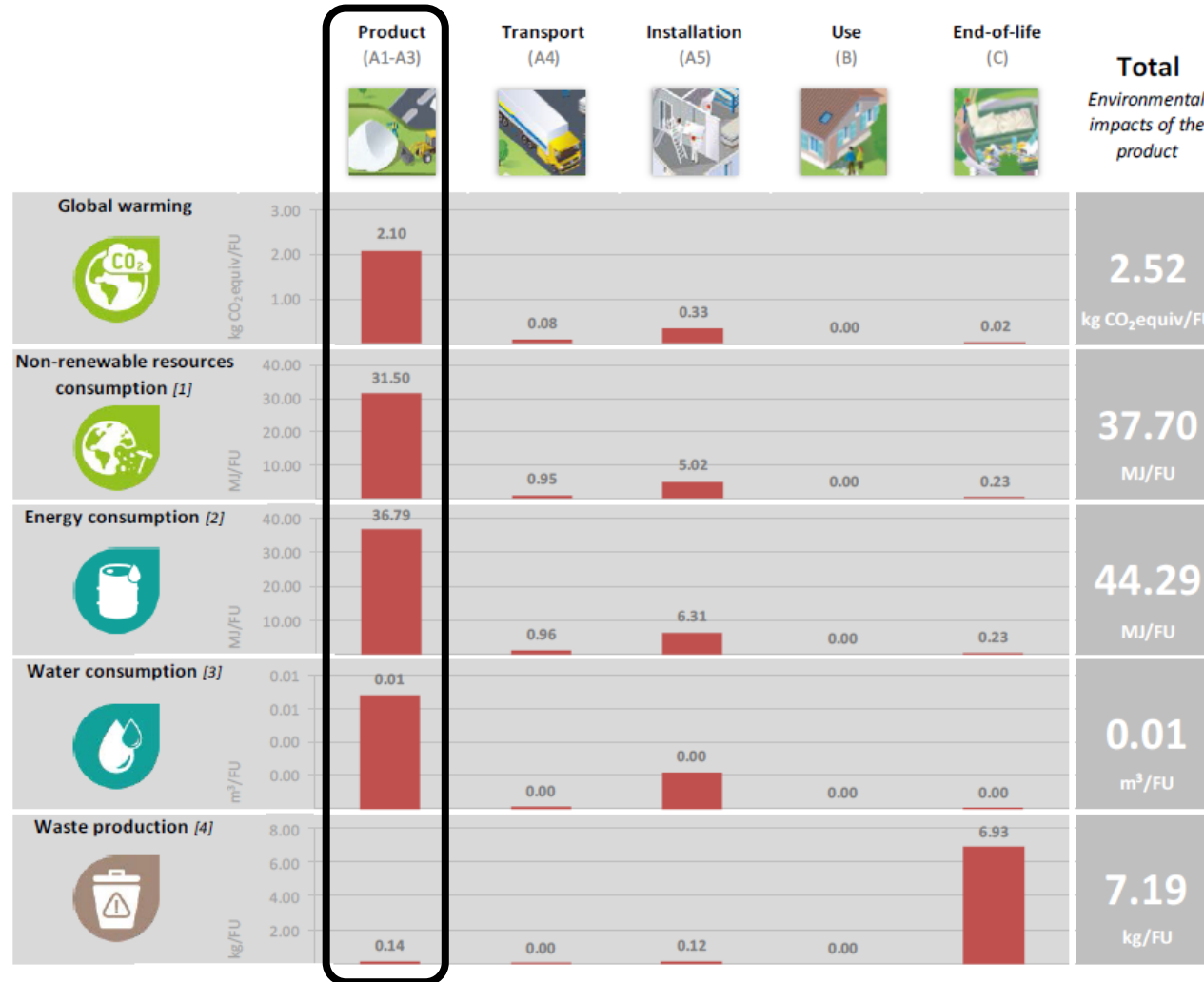


Calculation according to the Scenario information for each stage (A1-A3, A4, A5, B, C, D)

| ENVIRONMENTAL IMPACTS | | | | | | | | | | | | | | | |
|--|---------------|----------------------------|-----------------|-----------|----------------|-----------|----------------|------------------|---------------------------|--------------------------|-------------------------------|--------------|---------------------|-------------|------------------------------|
| Parameters | Product stage | Construction process stage | | Use stage | | | | | | | End-of-life stage | | | | D Reuse, recovery, recycling |
| | A1 / A2 / A3 | A4 Transport | A5 Installation | B1 Use | B2 Maintenance | B3 Repair | B4 Replacement | B5 Refurbishment | B6 Operational energy use | B7 Operational water use | C1 Deconstruction /demolition | C2 Transport | C3 Waste processing | C4 Disposal | |
|  Global Warming Potential (GWP 100) - kg CO₂equiv/FU | 3,64E+00 | 1,15E-01 | 2,34E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,27E-02 | 1,37E-02 | 5,51E-03 | 1,78E-01 | MNA |
| The global warming potential of a gas refers to the total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1. | | | | | | | | | | | | | | | |
|  Ozone Depletion (ODP) kg CFC 11 equiv/FU | 3,16E-07 | 1,76E-17 | 1,58E-08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,18E-18 | 3,17E-12 | 1,11E-09 | 9,96E-16 | MNA |
| Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbons or halons), which break down when they reach the stratosphere and then catalytically destroy ozone molecules. | | | | | | | | | | | | | | | |
|  Acidification potential (AP) kg SO₂ equiv/FU | 1,14E-02 | 4,59E-04 | 7,41E-04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,85E-04 | 5,57E-05 | 1,89E-05 | 1,02E-03 | MNA |
| Acid depositions have negative impacts on natural ecosystems and the man-made environment (incl. buildings). The main sources for emissions of acidifying substances are agriculture and fossil fuel combustion used for electricity production, heating and transport. | | | | | | | | | | | | | | | |

3- Environmental product declaration (EPD)

EPD results for a standard plasterboard



Average range value for standard plasterboard:

← 2- 3 kg

← 38 – 50 MJ

The highest impact is at production stage

3- Environmental product declaration (EPD)

LCAs and EPDs, the great evolution



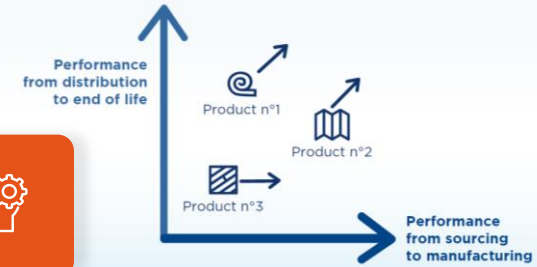
« BOX-TICKING »



PRODUCT
IMPROVEMENT



SUSTAINABLE
PORTFOLIO MANAGEMENT



EVOLUTION

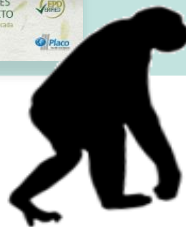
PRODUCT EPD



SYSTEM EPD



EPD BUILDING



Product
benchmark



Building
optimisation

3- Environmental product declaration (EPD)

Where to find third party verified EPDs? <https://www.environdec.com/>



THE INTERNATIONAL EPD[®] SYSTEM

“ Environmental Product Declarations (EPD) present transparent, verified and comparable information about the life-cycle environmental impact of products.

The International EPD[®] System is a global programme for environmental declarations based on ISO 14025 and EN 15804. Our online database currently contains more than 1100 EPDs for a wide range of product categories by organisations in 45 countries.”

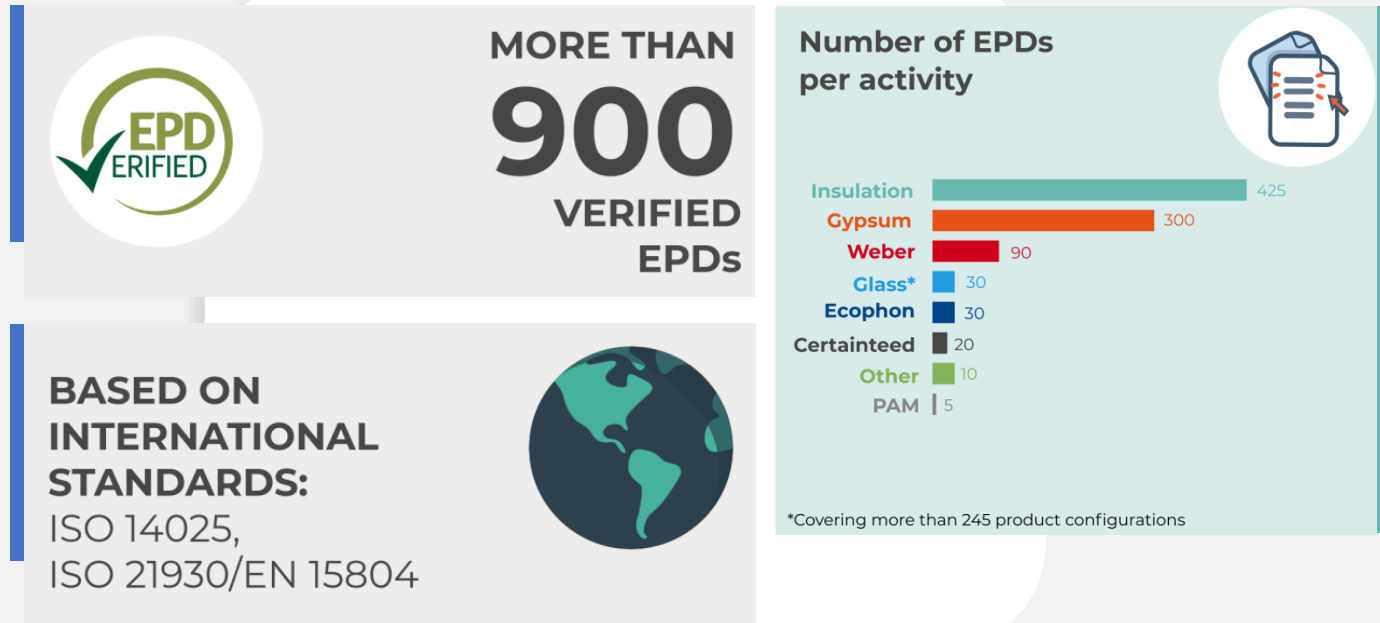


THE INTERNATIONAL EPD[®] SYSTEM



3- Environmental product declaration (EPD)

Saint-Gobain EPDs



Some of our brands which have EPDs:

Building Glass

vetrotech
SAINT-GOBAIN

Gyproc
SAINT-GOBAIN

KIMMCO ISOVER
SAINT-GOBAIN

ADFORS
SAINT-GOBAIN

weber
SAINT-GOBAIN

Ecophon
SAINT-GOBAIN
A SOUND EFFECT ON PEOPLE

SageGlass

PAM
SAINT-GOBAIN

3- Environmental product declaration (EPD)

Saint-Gobain EPDs

Countries where products are covered with EPDs



3- Environmental product declaration (EPD)

Eco-innovative products covered by Saint-Gobain EPDs



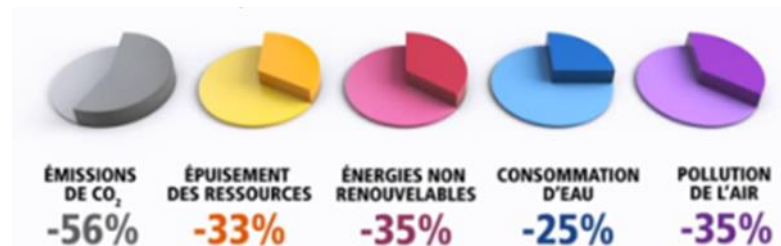
Glasswool insulation with biobased binder



Mortars with high recycled content and green binders



Stronger gypsumboard reducing material needs on site



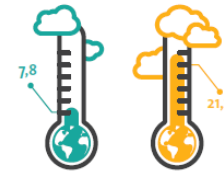
3- Environmental product declaration (EPD)

Internal walls covered by Saint-Gobain EPDs

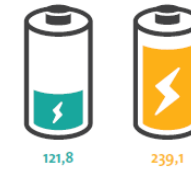


..... The environmental benefit of using drywall systems instead of brick systems, on 1m² of wall profile

1m² For 1 m² of partitions walls, using drywall systems instead of traditional systems **would save:**



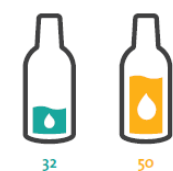
63%
reduction in global warming potential (kg CO₂ equiv/FU)



49%
reduction in primary energy use (MJ/FU)



80%
reduction in wall system weight (kg/FU)



36%
reduction in fresh water usage (L/FU)

..... Two wall profiles commonly used in Brazil, were assessed in this study, as described below:

THE PLACO® DRYWALL SYSTEM:



Insulated metal stud drywall

Details: Structure composed for STUD M70 and Channels R70, the Steel thickness is 0,50 mm. Placo® Standard Plasterboard 12,5 mm in the both side of the structure Glasswool 50 mm, finish by paper tape and pre mix compound and the Acoustic tape.

Reference: 95/70/600/ST 12,5 mm + Glasswool 75 mm

THE TRADITIONAL WALL SYSTEM:



Cement plastered 140 mm large brick

Details: Ceramic brick block for internal partitioning with 14cm thickness and gypsum plaster levelling (1 cm) in both sides

Reference: Tabique gran formato



3- Environmental product declaration (EPD)

Significant synergies

Improvements of LCA models and tools for product transparency and eco-innovation

Better knowledge on raw materials and chemical reactions

Gyproc Glasroc X by Saint Gobain Health Product Declaration v2.1.1
created via HPDC Online Builder

CLASSIFICATION: 09 29 00 Gypsum Board & 06 16 00 Sheathing
PRODUCT DESCRIPTION: This HPD covers the 12.5mm Gyproc Glasroc X board which is a high performance gypsum-based sheathing board with glass mat reinforcement embedded into its core for improved strength, fire and weather resistance also making it suitable for external applications.

Section 1: Summary Basic Method / Product Threshold

CONTENT INVENTORY

| Inventory Reporting Format | Threshold level | Residuals/Impurities | AF Substances Above the Threshold Indicated Are: |
|--|---------------------------------------|--|--|
| <input type="checkbox"/> Nested Materials Method | <input type="checkbox"/> 100 ppm | <input type="checkbox"/> Considered | <input type="checkbox"/> Characterized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| <input type="checkbox"/> Basic Method | <input type="checkbox"/> 1000 ppm | <input type="checkbox"/> Partially Considered | <input type="checkbox"/> <i>is weight and role provided for all substances.</i> |
| Threshold Disclosed Per | <input type="checkbox"/> Per GBC SDS | <input type="checkbox"/> Not Considered | <input type="checkbox"/> Screened <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| <input type="checkbox"/> Material | <input type="checkbox"/> Per GBC MSDS | <input type="checkbox"/> <i>Substances present in the material/product</i> | <input type="checkbox"/> <i>AF substances screened using Priority Hazard Lists with results disclosed</i> |
| <input type="checkbox"/> Product | <input type="checkbox"/> Other | <input type="checkbox"/> <i>Yes <input type="checkbox"/> <i>No</i></i> | <input type="checkbox"/> Identified <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| | | | <input type="checkbox"/> <i>AF substances disclosed by Name (Specific or Generic) and Identifier</i> |

CONTENT IN DESCENDING ORDER OF QUANTITY

Summary of product contents and results from screening individual chemical substances against HPD Priority Hazard Lists and the GreenScreen for Safer Chemicals®. The HPD does not assess whether using or handling this product will expose individuals to the chemical substances or any health risk. Refer to Section 2 for further details.

MATERIAL SUBSTANCE | RESIDUALS OF IMPURITIES

GREENSCREEN SCORE | HAZARD TYPE

GYPROC GLASROC X | CALCIUM SULFATE DIHYDRATE | 1000 | FIBER SLABS, BONDABLE AND/OR WITH ALKALINE COSE AND ADHESIVE EARTH OXIDE CONTENT (Sb) % BY WEIGHT | 1000 | UREA FORMALDEHYDE | 1000 | RES (EPOXY), CALCIUM CARBONATE | 1000 | SILICA FUMÉ | 1000 | CAN POLY(METHACRYLOXY)SILOXANE | 1000 | SODIUM POLY(METHACRYLOXY)SILOXANE | 1000 | PBT GLASS | 1000

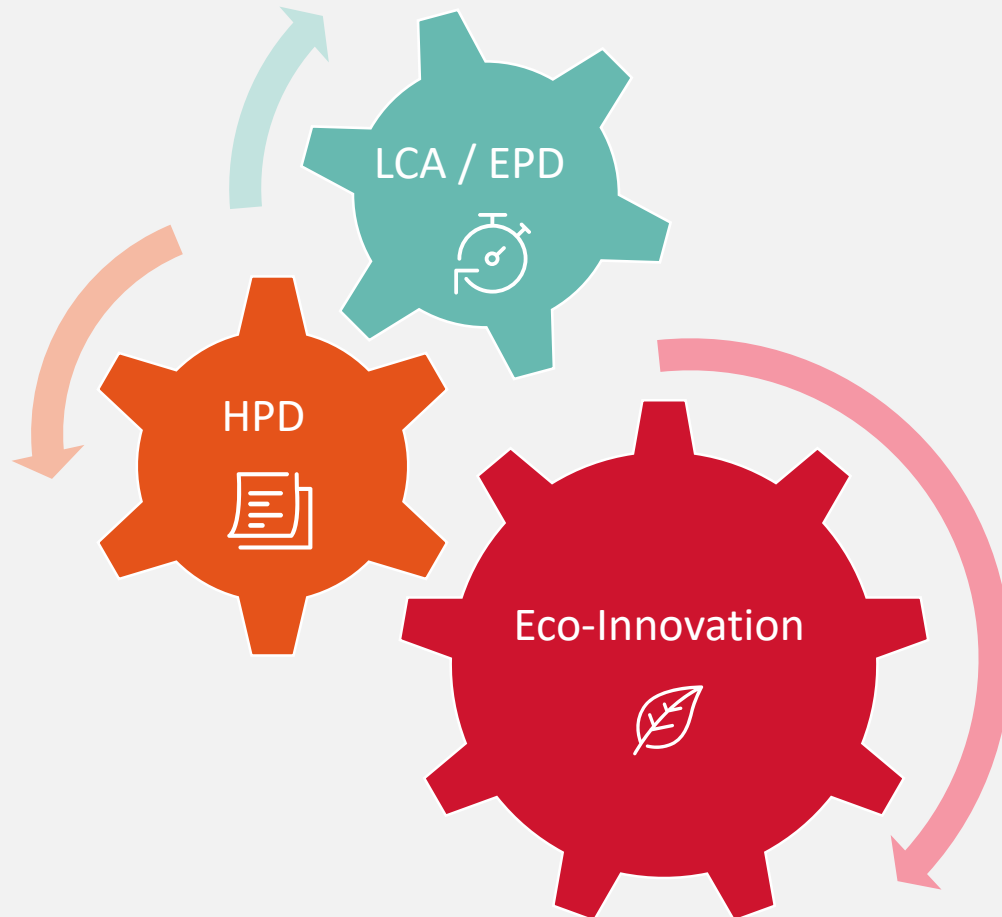
VOLATILE ORGANIC COMPOUND (VOC) CONTENT
VOC Content data is not applicable for this product category.

CERTIFICATIONS AND COMPLIANCE (See Section 3 for additional details)
VOC: *Not applicable*; AgBB: *Not applicable*

CONSISTENCY WITH OTHER PROGRAMS
No pre-checks completed or disclosed.

Third Party Verified? Yes No
PREPARED: Self-Prepared
VERIFICATION: VERIFICATION: e
SCREENING DATE: 2019-06-11
PUBLISHED DATE: 2019-06-11
EXPIRY DATE: 2022-06-11

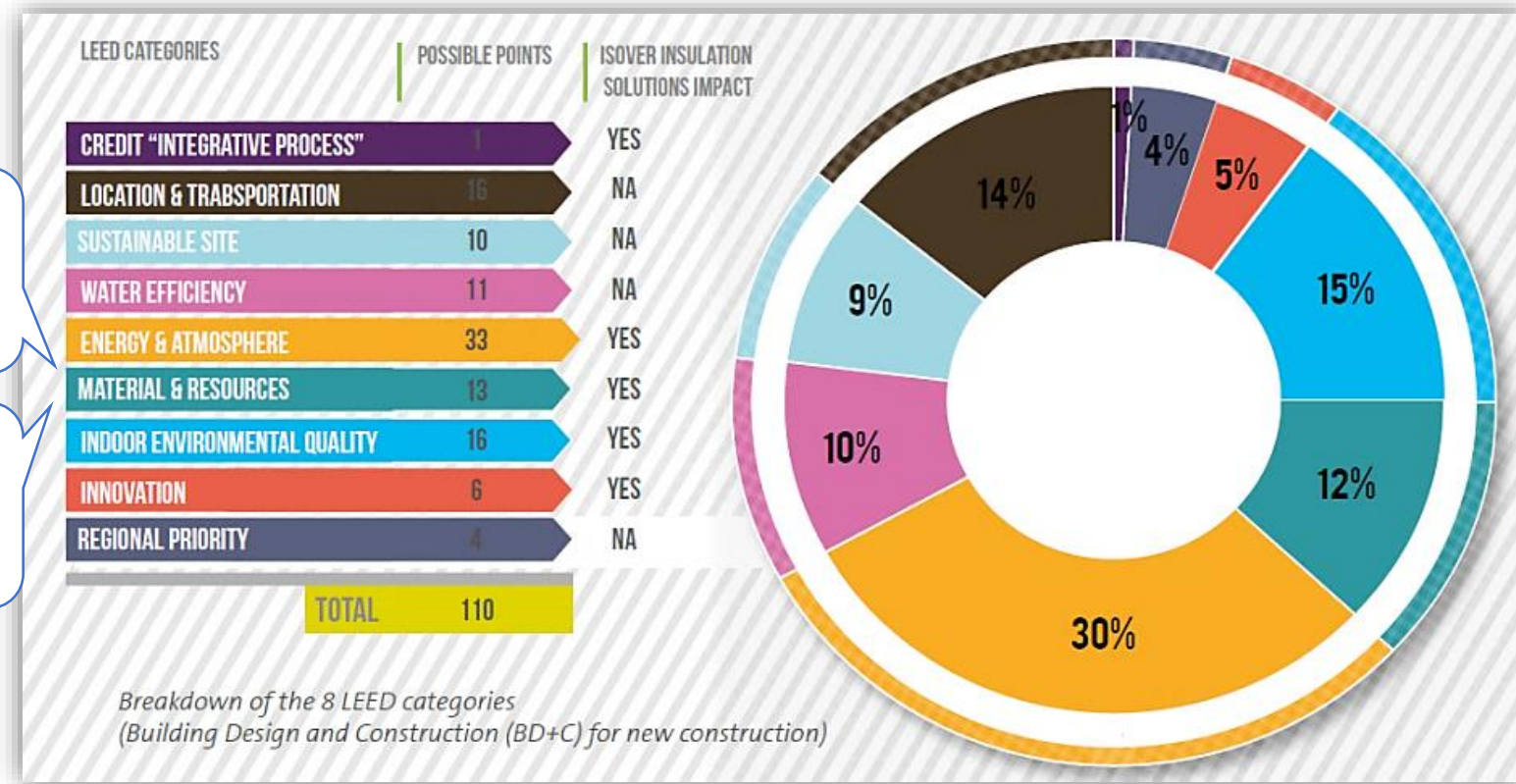
Gyproc Glasroc X
hpcrepository.hpd-collaborative.org
HPD v2.1.1 created via HPDC Builder Page 1 of 7



In-depth analysis of LCA results and identification of main contributors for existing solutions and alternatives



4- LEED v4 section and requirements



Building life-cycle impact reduction:
up to 5 points

Building product disclosure and optimization, verified EPDs:
up to 2 points

| LEED v4 points requirements | Certified: 40-49 | Silver: 50-59 | Gold: 60-79 | Platinum: >80 |
|-----------------------------|------------------|---------------|-------------|---------------|
|-----------------------------|------------------|---------------|-------------|---------------|

5- Other important product transparency documents



Out of USA



or



Ausschuss zur gesundheitlichen Bewertung von Bauprodukten



CERTIFIED CLEAN AIR GOLD



5- Other important product transparency documents

Air Renew® Essential by Saint Gobain

CLASSIFICATION: 09 29 00.00 Finishes: Gypsum Board
PRODUCT DESCRIPTION: Air Renew® Essential Gypsum wallboard products in 1/2 and 5/8 inch boards

Health Product Declaration v2.1.1

created via: HPDC Online Builder

Section 1: Summary
Nested Method / Product Threshold

CONTENT INVENTORY

| Inventory Reporting Format | Threshold level | Residuals/Impurities | All Substances Above the Threshold Indicated Are: |
|---|--|---|--|
| <input type="radio"/> Nested Materials Method <input type="radio"/> Basic Method | <input checked="" type="radio"/> 100 ppm <input type="radio"/> 1,000 ppm <input type="radio"/> Per GHS SDS <input type="radio"/> Per OSHA MSDS <input type="radio"/> Other | Residuals/Impurities Considered in 2 of 2 Materials Explanation(s) provided for Residuals/Impurities? <input checked="" type="radio"/> Yes <input type="radio"/> No | Characterized <input type="radio"/> Yes Ex/SC <input checked="" type="radio"/> Yes <input type="radio"/> No <i>% weight and role provided for all substances.</i> Screened <input type="radio"/> Yes Ex/SC <input checked="" type="radio"/> Yes <input type="radio"/> No <i>All substances screened using Priority Hazard Lists with results disclosed.</i> Identified <input type="radio"/> Yes Ex/SC <input checked="" type="radio"/> Yes <input type="radio"/> No <i>One or more substances not disclosed by Name (Specific or Generic) and Identifier and/ or one or more Special Condition did not follow guidance.</i> |

CONTENT IN DESCENDING ORDER OF QUANTITY

Summary of product contents and results from screening individual chemical substances against HPD Priority Hazard Lists and the GreenScreen for Safer Chemicals®. The HPD does not assess whether using or handling this product will expose individuals to its chemical substances or any health risk. Refer to Section 2 for further details.

MATERIAL | SUBSTANCE | RESIDUAL OR IMPURITY
GREENSCREEN SCORE | HAZARD TYPE

AIRRENEW ESSENTIALS CORE BOARD [CALCIUM SULFATE DIHYDRATE LT-UNK | STARCH (PRIMARY CASRN IS 9005-25-8) LT-UNK | UNDISCLOSED LT-UNK | MINERAL WOOL, BIOSOLUBLE AND/OR WITH ALKALINE OXIDE AND ALKALI EARTH OXIDE CONTENT ≤ 18 % BY WEIGHT LT-UNK | POLY(METHYLHYDROSILOXANE) NoGS | PORTLAND CEMENT LT-P1 | END | CAN SODIUM POLYNAPHTHALENESULFONATE LT-P1 | PBT POLY(OXY-1,2-ETHANEDIYL), ALPHA-SULFO-OMEGA-HYDROXY-, CB-10-ALKYL ETHERS, AMMONIUM SALTS LT-UNK | GLUCOSE BM-3 | PROTEIN HYDROLYSATE [USP] NoGS | 2-NAPHTHALENESULFONIC ACID, POLYMER WITH FORMALDEHYDE, SODIUM SALT LT-P1 | PBT QUARTZ LT-1 | CAN]
 PAPER FACING [CELLULOSE, MICROCRYSTALLINE NoGS | LIMESTONE, CALCIUM CARBONATE LT-UNK | KAOLIN, CALCINED LT-UNK | STARCH LT-UNK | ACETIC ACID ETHENYL ESTER, POLYMER WITH ETHENOL LT-UNK]



Self declaration
(possibility of Third-party verification)



Standard for content declaration at the state of the art
Threshold 0,1% or 0,01%



Hazard identification based on Greenscreen
Not consistent with the European regulatory framework

6- Game - Now, lets play!



ISOVER and GYPSUM cards



6- Game - Now, lets play!

Table of 4 people minimum

- For each table: define 2 teams made of 2 players each minimum
 - Draws a card on the pile of the colour corresponding to a category of question
 - Time is limited to 2 minutes per question



If you throw the hidden face, you roll the dice again

- First team to reach the « Finish! » space wins or that have correctly answered to more questions than the other team
- Time: 30 minutes



ANY QUESTIONS?

