

# Environmental Product Declaration



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

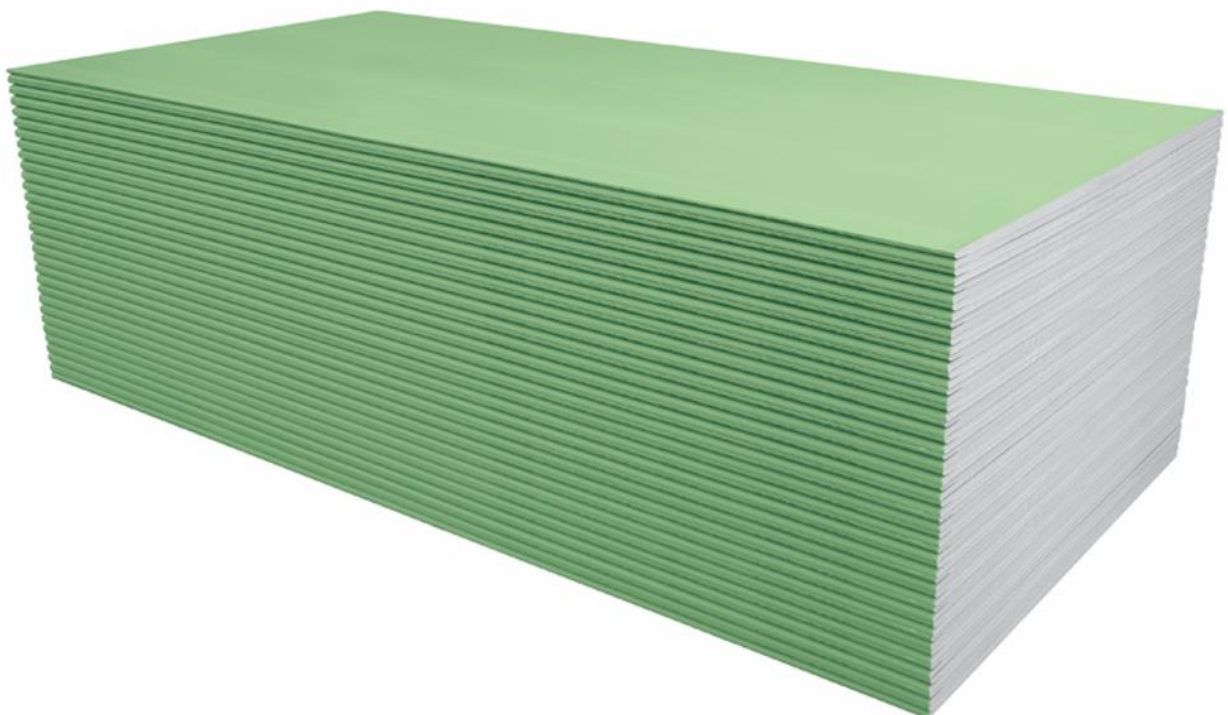
## Knauf Green 12.5mm

from



|                          |                                                                                          |
|--------------------------|------------------------------------------------------------------------------------------|
| Programme:               | The International EPD System, <a href="http://www.environdec.com">www.environdec.com</a> |
| Programme operator:      | EPD International AB                                                                     |
| Type of EPD:             | EPD of a single product from a manufacturer                                              |
| EPD registration number: | EPD-IES-0025231                                                                          |
| Version date:            | 2025-07-30                                                                               |
| Validity date:           | 2030-07-30                                                                               |

*An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see [www.environdec.com](http://www.environdec.com)*



## GENERAL INFORMATION

| Programme Information |                                                                     |
|-----------------------|---------------------------------------------------------------------|
| <b>Programme:</b>     | The International EPD® System                                       |
| <b>Address:</b>       | EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden |
| <b>Website:</b>       | <a href="http://www.environdec.com">www.environdec.com</a>          |
| <b>E-mail:</b>        | <a href="mailto:support@environdec.com">support@environdec.com</a>  |

| Product Category Rules (PCR)                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CEN standard EN 15804 serves as the Core Product Category Rules (PCR)</b>                                                                                                                                                                |
| <b>Product Category Rules (PCR):</b> <i>Construction Products, PCR 2019:14 Version 2.0.1</i>                                                                                                                                                |
| <b>PCR review was conducted by:</b> <i>The Technical Committee of the International EPD System. See <a href="http://www.environdec.com">www.environdec.com</a> for a list of members. Review chair - Rob Rouwette, co-chair - Noa Meron</i> |
| <b>c-PCR:</b> <i>c-PCR-031 Gypsum-based construction products (EN 17328:2024) Version 1.0.0</i>                                                                                                                                             |

| Third-party Verification                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:                                                                                                                                                                                                      |
| <input checked="" type="checkbox"/> <b>Individual EPD verification without a pre-verified LCA/EPD tool</b><br>Third-party verifier: <i>Elisabet Amat Guasch, GREENIZE</i><br>Approved by: International EPD System  |
| Procedure for follow-up of data during EPD validity involves third party verifier:                                                                                                                                                                                                                       |
| <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                                                                                                                                                                                                                      |

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

## INFORMATION ABOUT EPD OWNER

### Owner of the EPD:

KNAUF SIA

### Address:

Institūta iela 108, Saurieši, Stopiņu pag., Ropažu nov., Latvija, LV-2118

### Contact:

Arturs Prieditis, Quality manager

+371 29164434, [Arturs.Prieditis@knauf.com](mailto:Arturs.Prieditis@knauf.com)

### Address and contact information of the LCA practitioner commissioned by the EPD owner, if applicable:

Aleksandrs Šiškins, Bureau Veritas Latvia SIA, [riga@bureauveritas.com](mailto:riga@bureauveritas.com)

### Description of the organisation:

Knauf is one of the world's leading manufacturers of building materials, operating in more than 60 countries with over 300 production facilities and employing more than 23000 people. In 2023, the company's turnover reached €15.4 billion.

Knauf offers a wide range of products, including gypsum boards, plasters, insulation materials, and other construction materials that meet the highest quality standards. The company actively engages in sustainable construction, providing eco-friendly materials with "Green Certificates" and supporting the BREEAM sustainable construction assessment method.

The Knauf Latvia plant in Saurieši, opened in 1997. 1997 opened profile production, 1998 gypsum plasters, 2000 gypsum plasters. 2006 Cement base powder products, 2011 perlite production, now plant produces high-quality perlite, significantly reducing production costs and offering customers competitive prices. 2017 company invest in gypsum recycling equipment. And 2018 build ready mix line. The company has been recognized for its excellent reputation, ranking first in the Latvian Company Reputation Top for the mining and manufacturing industry in 2007. In 2024 company win "Export champion" award.

Knauf Latvia continues to develop while implementing energy-efficient production processes and reducing CO<sub>2</sub> emissions, demonstrating its commitment to environmental protection.

### Product-related or management system-related certifications:

Company has following Management systems and Product certificates:

- Quality management system, according to ISO 9001:2015
- Environmental management system, according to ISO 14001:2015
- Energy management system, according to ISO 50001:2018
- Occupational health and safety management system, according to ISO 45001:2018
- EN 520:2004+A1:2009. Gypsum plasterboards - Definitions, requirements and test methods
- DIN 18180:2014-09. Gypsum plasterboards - Types and requirements.

## PRODUCT INFORMATION

### Product name:

Knauf Green 12.5mm impregnated gypsum plasterboard

### UN CPC code:

314 – Boards and panels

### Product description:

Gypsum plasterboard is a lightweight, durable construction material consisting of a gypsum core encased in high-quality paper. It is designed for creating walls, ceilings, and partitions in residential and commercial buildings. It provides a smooth surface for decorative finishes such as plaster or paint, while offering excellent sound insulation and fire resistance.

Knauf Green has reduced water absorption properties.

Knauf Green is used in all fields of interior works as economic cladding of drywall systems in rooms with moderately high humidity. Rooms with moderately high humidity are rooms with a constant relative air humidity of  $\leq 70\%$  (e.g. domestic bathrooms).

For indoor use.

### Technical parameters

|                                                   |                   |              |                     |
|---------------------------------------------------|-------------------|--------------|---------------------|
| <b>Board type:</b>                                |                   | GKBI<br>H2   | DIN 18180<br>EN 520 |
| <b>Reaction to fire EN 13501-1:</b>               |                   | A2-s1,d0 (B) | EN 520              |
| <b>Thermal conductivity <math>\lambda</math>:</b> | W/(m.K)           | 0.21         | EN ISO 10456        |
| <b>Density:</b>                                   | kg/m <sup>3</sup> | $\geq 680$   | DIN 18180           |
| <b>Board weight:</b>                              | kg/m <sup>2</sup> | $\geq 8.5$   | DIN 18180           |

### Name and location of production site(s):

Institūta iela 108, Saurieši, Stopiņu pag., Ropažu nov., Latvija, LV-2118

### References to any relevant websites for more information or explanatory materials:

<https://knauf.com/lv-LV>

## CONTENT DECLARATION

Product content and packaging materials in the Tables below are displayed per Declared unit (1 m<sup>2</sup>):

| Product content    | Mass, kg   | Post-consumer recycled material, mass-% of product | Biogenic material |                  |
|--------------------|------------|----------------------------------------------------|-------------------|------------------|
|                    |            |                                                    | mass-% of product | kg C/DU          |
| Plasterboard liner | 0,3        | 92,8%                                              | 100,0%            | 0,17 kg C        |
| Stucco             | 7,3        | 0%                                                 | 0,0%              | 0 kg C           |
| Additives          | 0,2        | 0%                                                 | 0,0%              | 0 kg C           |
| Water              | 1,0        | 0%                                                 | 0,0%              | 0 kg C           |
| <b>TOTAL</b>       | <b>8,9</b> | <b>3,5%</b>                                        | <b>1,9%</b>       | <b>0,17 kg C</b> |

| Packaging materials | Mass, kg   | Mass-% (versus the product) | Biogenic material, kg C/DU |
|---------------------|------------|-----------------------------|----------------------------|
| Wooden pallets      | 0,3        | 3,5%                        | 0,14                       |
| Steel corners       | <0,01      | <0,01%                      | 0,00                       |
| Plastic straps      | <0,01      | <0,01%                      | 0,00                       |
| Cardboard corners   | <0,01      | <0,01%                      | <0,01                      |
| Packaging film      | <0,01      | <0,01%                      | 0,00                       |
| Stretch film        | <0,01      | <0,01%                      | 0,00                       |
| <b>TOTAL</b>        | <b>0,3</b> | <b>3,5%</b>                 | <b>0,14</b>                |

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO<sub>2</sub>.

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.

## LCA INFORMATION

### Declared unit:

1m<sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard

Weight of the declared unit – 8.9 kg, conversion factor to 1 kg – 0.1122

### Reference service life:

According to EN 17328:2024, there are no influences on ageing when the recognized codes of application are followed for gypsum products. Therefore, the technical performance characteristics of gypsum-based products are usually based on a minimum service life of 50 years.

### Time representativeness:

Data represents the manufacturing of the product in 2023. The database used for proxy data is Ecoinvent v3.10. This database data is compiled in March 2024, i.e., no data is older than ten years.

### Geographical scope:

This EPD has a Global scope, with modules A3, A4-A5 and C1-C4 representing European scope.

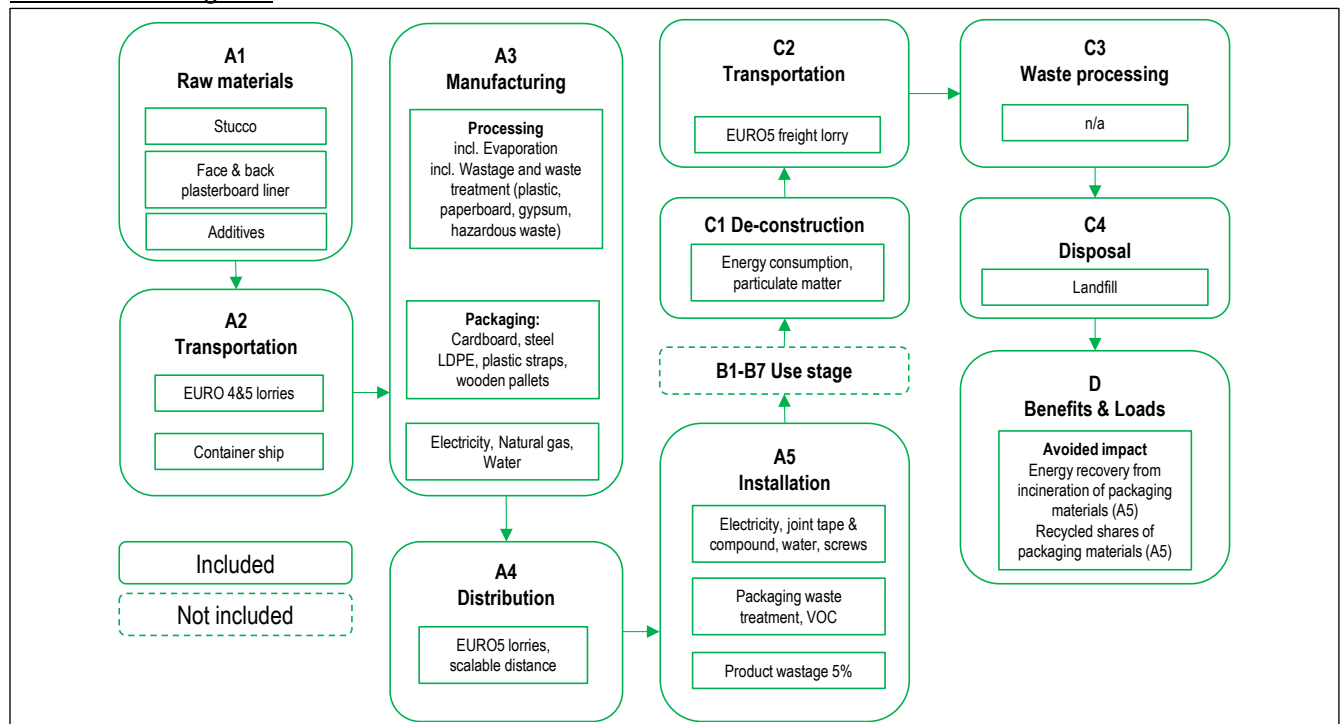
### Database(s) and LCA software used:

Ecoinvent v3.10 has been used to conduct the quantitative evaluation in this study. This database provided the background system's life cycle inventory data for raw and processed materials. The LCA software used - SimaPro 9.6.

### Description of system boundaries:

This LCA study has been performed as “Cradle to gate with options, modules C1–C4, module D and with optional modules”, also considering Transportation module A4 and Installation module A5.

### Process flow diagram:



#### Data quality:

The foreground data has been collected internally, considering the latest available average production amounts and measurements during the time period of 2023. Data regarding waste processing has been taken from waste scenarios for closest locations in Ecoinvent v3.10. The quality level in this study is qualified as Very good. Data quality rating procedure has been performed using a rating system where “1” means Excellent quality, and “5” means Poor quality.

| Technological Representativeness, TeR | Geographic representativeness, GeR | Time Representativeness, TiR | Precision, P | Average DQR |
|---------------------------------------|------------------------------------|------------------------------|--------------|-------------|
| 1,4                                   | 1,8                                | 2,0                          | 2,3          | 1,9         |

| Process                                                          | Source type    | Source                     | Reference year | Data category                | Share of primary data, of GWP-GHG results for A1-A3 |
|------------------------------------------------------------------|----------------|----------------------------|----------------|------------------------------|-----------------------------------------------------|
| Transport of raw materials and packaging to the production site  | Collected data | EPD owner, Ecoinvent v3.10 | 2023-2024      | Primary data, secondary data | 6%                                                  |
| SpreeGips Plasterboard Liner from Hamburger Containerboard GmbH  | EPD            | S-P-12187                  | 2024           | Primary data, secondary data | 1%                                                  |
| UNIPLAC Plasterboard Liner from Moritz J. Weig GmbH              | EPD            | S-P-08304                  | 2023           | Primary data, secondary data | 5%                                                  |
| CEM II/A-LL 52.5 N from SCHWENK Sverige AB                       | EPD            | NEPD-5093-4427-EN          | 2023           | Primary data, secondary data | 0,1%                                                |
| Manufacturing of product                                         | Collected data | EPD owner                  | 2023           | Primary data                 | 38%                                                 |
| Generation of electricity used in manufacturing of product       | Database       | Ecoinvent v3.10            | 2024           | Primary data                 |                                                     |
| Production of packaging                                          | Database       | Ecoinvent v3.10            | 2023-2024      | Primary data, secondary data |                                                     |
| Other processes                                                  | Database       | Ecoinvent v3.10            | 2024           | Secondary data               | 0%                                                  |
| <b>Total share of primary data, of GWP-GHG results for A1-A3</b> |                |                            |                |                              | <b>50%</b>                                          |

#### Cut-off criteria:

To LCA practitioner knowledge there is no missing data for processes within the system boundaries. All the materials and processes which have been accounted for by the manufacturing company for the relevant manufacturing process are included in the LCI. The cut-off in LCA is according to PCR:” General cut-off criteria are given in standard EN 15804:2012+A2, clause 6.3.6.

The processes related to infrastructure, construction, and production of equipment, as well as tools that are not directly consumed in the production process, have been excluded. Personnel-related activities, such as transportation to and from work, have also been excluded.

#### Allocation:

General allocation principles have been applied according to ISO 14044:2006 4.3.4 and in line with the provisions of EN 15804:2012+A2. Inputs and outputs are allocated equally among all products using production volumes. The methodological choices for allocation for reuse, recycling and recovery have been set according to the polluter pays principle (PPP).

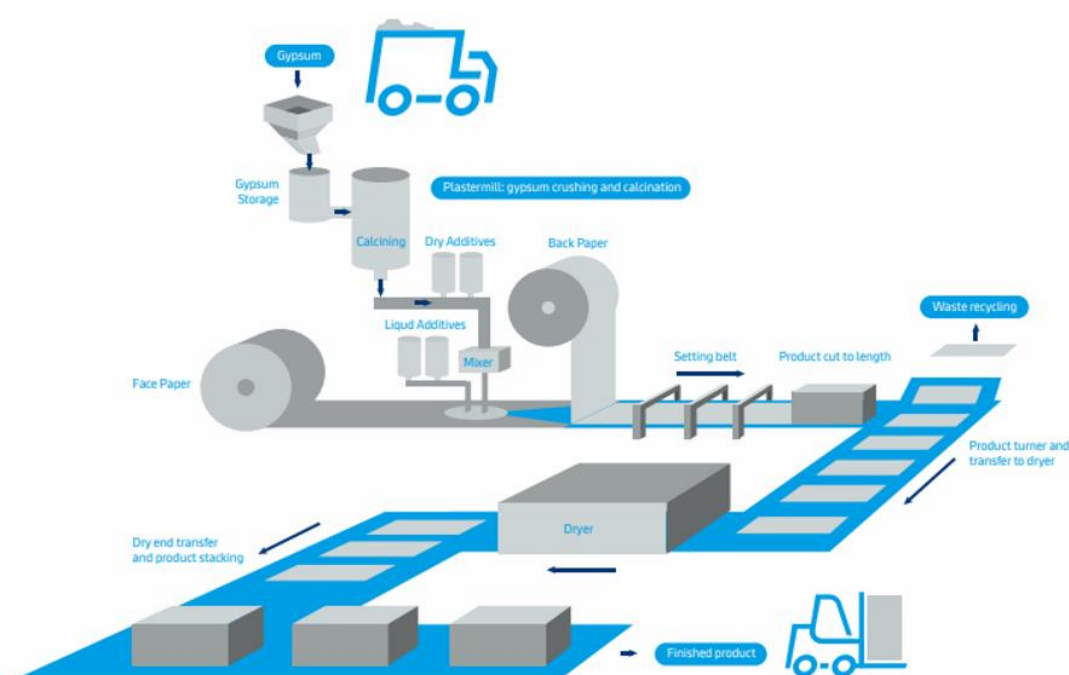
## Stages and Production description

### Product Stage

In **module A1** extraction and processing of raw materials and generation of electricity and heat from primary energy resources, used to produce these raw materials, are included. Gypsum plasterboards consist of a gypsum core which also contains additives. These additives in total add up to 2.6% of the overall mass of the declared plasterboard. The natural gypsum is mainly extracted from open-cast mining in close vicinity (7 km) to the manufacturing site. After extraction it is pre-processed, i.e., crushed, dried, milled and converted to stucco. Plasterboard liner used as a cover of gypsum core from both sides is produced from post-consumer scrap wastepaper, as per EPD from supplier.

For **module A2**, the transportation of raw materials and product's packaging materials to the production plant has been considered. Following conservative approach, EURO5 16-32t freight lorry has been assumed as a road transportation mode. One additive is supplied from Asia, therefore, use of Containership is considered in module A2. Other additives, face and back liner are supplied from European countries, while Gypsum itself is supplied from quarry near (7 km) production plant.

Natural gypsum that has been calcinated to stucco is mixed (**module A3**) with other dry components. Afterwards stucco and additives are mixed with water and spread on a continuous sheet of plasterboard liner (face paper). The slurry is covered with a second sheet of plasterboard liner (back paper) and the edges of the liner are glued together. On the subsequent board production line, the gypsum sets continuously, and the boards are dried using heat from Natural gas. Drying is followed by the cutting of the boards to the desired length, while off-cuts are sent back to the calcination step as a substitute of virgin material. Finally, gypsum boards are piled up on wooden pallets, protected against damage by steel angles and cardboard corners, fastened with plastic straps and wrapped with plastic packaging film. Electricity consumed during manufacturing is modelled as National residual grid mix of Latvia. GWP-GHG of this particular dataset is 0.625 kg CO<sub>2</sub>eq/kWh. Waste treatment of the disposed part of gypsum (landfill) and the packaging of raw materials is also considered in module A3, following manufacturer declared scenarios and national waste scenarios per each waste type.



### Construction process Stage

Product is intended for Baltic states and, therefore, a distance of 100 km has been assumed. This allows the user of EPD to extrapolate results of module A4 to the distance from the production site to any construction site. Table below describes considered scenario for **module A4** transportation of the final product with its respective packaging.

| Vehicle             | kg per DU | Distance, km | Fuel consumption, l/tkm | Value, l/t |
|---------------------|-----------|--------------|-------------------------|------------|
| Lorry 16-32t, EURO5 | 9,21E+01  | 100          | 0,0441                  | 4,41       |

**Module A5** in this type of LCA study is optional but for the purpose of declaring product wastage, consumed resources, energy and waste treatment of product's packaging, it has been declared as well.

According to EN 17328:2024, material wastage of gypsum-based products should be estimated based on information from the manufacturer and information of relevance for the intended market. Since no estimate is available due to the lack of data, **5% product wastage has been considered**.

The following assumptions on installation materials and resources have been made, per declared unit of 1 m<sup>2</sup>:

|                       |     |       |
|-----------------------|-----|-------|
| Jointing compound     | kg  | 0,280 |
| Water                 | l   | 0,168 |
| Jointing tape         | kg  | 0,006 |
| Screws                | kg  | 0,018 |
| Electricity for tools | kWh | 0,003 |
| VOC                   | g   | 0,383 |
| Product wastage       | %   | 5,0   |

Product wastage is considered for Landfill, while packaging materials have been modelled in accordance with EU-27 municipal waste treatment scenario as follows:

| Material   | Recycling | Incineration | Disposal |
|------------|-----------|--------------|----------|
| Paperboard | 82.3%     | 9.3%         | 8.4%     |
| Plastics   | 41.0%     | 31.2%        | 27.8%    |
| Steel      | 78.0%     | 11.6%*       | 10.4%    |
| Wood       | n/a       | 100%         | n/a      |

\*Incineration without energy recovery

### Use Stage:

**Modules B1-B7**, that define use stage of the product, are not declared for this study – these are not mandatory for LCA “Cradle-to-gate with options” form.

The product has a reference service life of 50 years, assuming no specific requirements for maintenance, repair, replacement, or refurbishment throughout this period. Therefore, no impact is generated at this stage.

### **End of Life Stage:**

**Modules C1-C4** and Module D are mandatory for LCA type considered, therefore, have also been considered for the purpose of this study. According to EN 17328:2024, if no data for recycling is available, **landfilling** shall be modelled as default end-of-life option. Default data for modelling modules C1-C4 has been considered in accordance with PCR 2019:14 v.2.0.1.

For the purpose of declaring **module C1**, both consumption of energy (1.1 kWh/t) and the impact of demolition (particulate emissions) have been considered.

Plasterboards are assumed to be sent (**module C2**) to the closest waste treatment facilities, assuming 80km distance between sites that is covered by 16-32t EURO5 Freight lorry.

Waste processing, **module C3**, generates no impact since the common waste treatment scenario for gypsum plasterboard is Landfill.

Disposal of the gypsum plasterboard, **module C4**, has been assumed to be conducted via landfilling. Shares of both gypsum and plasterboard liner have been considered to represent the environmental impact of these activities more accurately. Energy necessary for compacting of waste has been considered using default value of 1.6 kWh/t.

### **Benefits and loads beyond the system boundaries:**

**Module D** considers the benefit of recovered energy from incineration of plastic, paper, cardboard and wooden pallets, i.e., respective shares of the product packaging waste flows declared in Installation module A5. Net Energy generated from Incineration activities has been considered for product's market split (Estonia 23%, Lithuania 49%, Latvia 28%) as follows:

- for Electric energy (3.93 MJ/kg for plastic, 1.99 MJ/kg for cardboard and paper, 1.74 MJ/kg for wood)
- Natural gas for thermal energy (7.67 MJ/kg for plastic, 3.99 MJ/kg for cardboard and paper, 3.50 MJ/kg for wood).

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

|                       | Product stage       |           |               | Distribution/<br>installation<br>stage |                           | Use stage |             |        |             |               |                        |                       | End-of-life stage          |           |                  |          | Beyond<br>product<br>life cycle        |
|-----------------------|---------------------|-----------|---------------|----------------------------------------|---------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|----------------------------------------|
|                       | Raw material supply | Transport | Manufacturing | Transport                              | Construction installation | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-<br>potential |
| Module                | A1                  | A2        | A3            | A4                                     | A5                        | B1        | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                         | C2        | C3               | C4       | D                                      |
| Modules declared      | X                   | X         | X             | X                                      | X                         | ND        | ND          | ND     | ND          | ND            | ND                     | ND                    | X                          | X         | X                | X        | X                                      |
| Geography             | GLO                 | GLO       | LV            | EU                                     | EU                        | ND        | ND          | ND     | ND          | ND            | ND                     | ND                    | EU                         | EU        | EU               | EU       | EU                                     |
| Share of primary data | >50%                |           |               | -                                      | -                         | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                      |
| Variation – products  | 0%                  |           |               | -                                      | -                         | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                      |
| Variation – sites     | 0%                  |           |               | -                                      | -                         | -         | -           | -      | -           | -             | -                      | -                     | -                          | -         | -                | -        | -                                      |

## ENVIRONMENTAL PERFORMANCE

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

### Mandatory impact category indicators according to EN 15804 (EF 3.1 reference package)

| Results per declared unit – 1 m <sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |          |          |          |          |          |          |          |           |
|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator                                                                                        | Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
| GWP-total                                                                                        | kg CO <sub>2</sub> eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2,44E+00 | 1,43E-01 | 2,28E-01 | 3,31E-03 | 1,11E-01 | 0,00E+00 | 2,90E-02 | -1,59E-01 |
| GWP-fossil                                                                                       | kg CO <sub>2</sub> eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2,43E+00 | 1,43E-01 | 2,27E-01 | 3,31E-03 | 1,11E-01 | 0,00E+00 | 2,89E-02 | -1,59E-01 |
| GWP-biogenic                                                                                     | kg CO <sub>2</sub> eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2,82E-03 | 5,39E-06 | 2,51E-04 | 1,42E-07 | 4,17E-06 | 0,00E+00 | 2,30E-06 | -3,51E-05 |
| GWP-luluc                                                                                        | kg CO <sub>2</sub> eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1,23E-02 | 3,52E-06 | 8,08E-04 | 1,15E-07 | 2,72E-06 | 0,00E+00 | 1,18E-06 | -3,64E-05 |
| ODP                                                                                              | kg CFC 11 eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2,76E-05 | 2,92E-09 | 1,38E-06 | 5,21E-11 | 2,25E-09 | 0,00E+00 | 4,34E-10 | 3,31E-12  |
| AP                                                                                               | mol H <sup>+</sup> eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7,68E-03 | 3,56E-04 | 8,78E-04 | 3,09E-05 | 2,75E-04 | 0,00E+00 | 2,64E-04 | -3,22E-04 |
| EP-freshwater                                                                                    | kg P eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6,75E-05 | 1,20E-07 | 8,53E-06 | 3,13E-09 | 9,27E-08 | 0,00E+00 | 8,93E-08 | -2,81E-06 |
| EP-marine                                                                                        | kg N eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2,02E-03 | 1,37E-04 | 2,35E-04 | 1,45E-05 | 1,06E-04 | 0,00E+00 | 1,21E-04 | -7,00E-05 |
| EP-terrestrial                                                                                   | mol N eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2,26E-02 | 1,49E-03 | 2,61E-03 | 1,59E-04 | 1,16E-03 | 0,00E+00 | 1,33E-03 | -7,72E-04 |
| POCP                                                                                             | kg NMVO C eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 8,24E-03 | 6,21E-04 | 9,81E-04 | 4,74E-05 | 4,80E-04 | 0,00E+00 | 4,00E-04 | -3,43E-04 |
| ADP-minerals&metals*                                                                             | kg Sb eq.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4,18E-06 | 4,72E-09 | 4,62E-07 | 1,38E-10 | 3,65E-09 | 0,00E+00 | 1,16E-09 | -1,07E-09 |
| ADP-fossil*                                                                                      | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3,71E+01 | 1,89E+00 | 3,07E+00 | 4,36E-02 | 1,46E+00 | 0,00E+00 | 3,74E-01 | -2,47E+00 |
| WDP*                                                                                             | m <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1,09E+00 | 8,02E-04 | 9,57E-02 | 3,44E-05 | 6,20E-04 | 0,00E+00 | 3,30E-04 | -1,27E-02 |
| Acronyms                                                                                         | GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption |          |          |          |          |          |          |          |           |

\* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Biogenic CO<sub>2</sub> emissions and uptakes are balanced out in each individual module.

## Additional mandatory and voluntary impact category indicators

| Results per declared unit – 1 m <sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard |                                                                                                                                                                                                                                      |          |          |          |          |          |          |          |           |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator                                                                                        | Unit                                                                                                                                                                                                                                 | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
| GWP-GHG <sup>1</sup>                                                                             | kg CO <sub>2</sub> eq.                                                                                                                                                                                                               | 2,44E+00 | 1,43E-01 | 2,28E-01 | 3,31E-03 | 1,11E-01 | 0,00E+00 | 2,90E-02 | -1,59E-01 |
| PM                                                                                               | Disease inc.                                                                                                                                                                                                                         | 9,24E-08 | 9,39E-09 | 1,28E-08 | 6,71E-08 | 7,26E-09 | 0,00E+00 | 7,48E-09 | -1,63E-09 |
| IRP                                                                                              | kBq U-235 eq.                                                                                                                                                                                                                        | 4,53E-02 | 2,57E-04 | 3,73E-03 | 3,90E-06 | 1,99E-04 | 0,00E+00 | 3,88E-05 | -5,69E-03 |
| ETP-fw                                                                                           | CTUe                                                                                                                                                                                                                                 | 2,66E+01 | 6,40E-02 | 2,98E+00 | 1,51E-03 | 4,95E-02 | 0,00E+00 | 1,66E-02 | -5,77E-01 |
| HTP-c                                                                                            | CTUh                                                                                                                                                                                                                                 | 3,17E-08 | 1,08E-11 | 6,12E-09 | 2,31E-13 | 8,31E-12 | 0,00E+00 | 5,47E-12 | -1,46E-09 |
| HTP-nc                                                                                           | CTUh                                                                                                                                                                                                                                 | 1,03E-08 | 9,43E-10 | 2,04E-09 | 3,28E-12 | 7,29E-10 | 0,00E+00 | 3,69E-11 | -3,98E-10 |
| SQP                                                                                              | dimensionless                                                                                                                                                                                                                        | 4,53E+01 | 4,23E-03 | 3,56E+00 | 9,24E-05 | 3,27E-03 | 0,00E+00 | 3,67E-01 | -1,05E-01 |
| Acronyms                                                                                         | PM = Particulate matter emissions; IRP = Ionising radiation, human health; ETP-fw = Ecotoxicity, freshwater; HTP-c = Human toxicity, cancer effects; HTP-nc = Human toxicity, non-cancer effects; SQP = Potential Soil quality index |          |          |          |          |          |          |          |           |

## Resource use indicators

| Results per declared unit – 1 m <sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |          |          |          |          |          |          |           |
|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator                                                                                        | Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
| PERE                                                                                             | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1,45E+00 | 5,86E-03 | 1,27E-01 | 8,65E-05 | 4,53E-03 | 0,00E+00 | 9,23E-04 | -8,39E-02 |
| PERM                                                                                             | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8,19E+00 | 6,99E-04 | 5,99E-01 | 9,44E-06 | 5,40E-04 | 0,00E+00 | 8,08E-04 | -1,46E-02 |
| PERT                                                                                             | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 9,64E+00 | 6,56E-03 | 7,26E-01 | 9,59E-05 | 5,07E-03 | 0,00E+00 | 1,73E-03 | -9,86E-02 |
| PENRE                                                                                            | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3,71E+01 | 1,89E+00 | 3,07E+00 | 4,36E-02 | 1,46E+00 | 0,00E+00 | 3,74E-01 | -2,47E+00 |
| PENRM                                                                                            | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2,28E-02 | 2,36E-07 | 1,40E-03 | 1,02E-07 | 1,82E-07 | 0,00E+00 | 1,10E-06 | -4,30E-06 |
| PENRT                                                                                            | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3,71E+01 | 1,89E+00 | 3,08E+00 | 4,36E-02 | 1,46E+00 | 0,00E+00 | 3,74E-01 | -2,47E+00 |
| SM                                                                                               | kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3,36E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| RSF                                                                                              | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| NRSF                                                                                             | MJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| FW                                                                                               | m <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2,78E-02 | 4,85E-05 | 2,59E-03 | 1,37E-06 | 3,75E-05 | 0,00E+00 | 1,28E-05 | -1,45E-03 |
| Acronyms                                                                                         | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water |          |          |          |          |          |          |          |           |

<sup>1</sup> This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO<sub>2</sub> is set to zero.

## Waste indicators

| Results per declared unit – 1 m <sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard |      |          |          |          |          |          |          |          |           |
|--------------------------------------------------------------------------------------------------|------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator                                                                                        | Unit | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
| Hazardous waste disposed                                                                         | kg   | 1,25E-03 | 1,25E-05 | 7,06E-05 | 2,99E-07 | 9,67E-06 | 0,00E+00 | 2,49E-06 | -8,70E-06 |
| Non-hazardous waste disposed                                                                     | kg   | 5,22E-01 | 5,61E-05 | 4,73E-01 | 1,25E-06 | 4,34E-05 | 0,00E+00 | 8,89E+00 | -5,24E-04 |
| Radioactive waste disposed                                                                       | kg   | 3,55E-05 | 1,77E-07 | 2,76E-06 | 2,23E-09 | 1,37E-07 | 0,00E+00 | 2,24E-08 | -3,75E-06 |

## Output flow indicators

| Results per declared unit – 1 m <sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard |      |          |          |          |          |          |          |          |          |
|--------------------------------------------------------------------------------------------------|------|----------|----------|----------|----------|----------|----------|----------|----------|
| Indicator                                                                                        | Unit | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D        |
| Components for re-use                                                                            | kg   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Material for recycling                                                                           | kg   | 6,83E-05 | 0,00E+00 | 8,91E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for energy recovery                                                                    | kg   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy, electricity                                                                     | MJ   | 3,07E-06 | 0,00E+00 | 5,67E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy, thermal                                                                         | MJ   | 6,08E-06 | 0,00E+00 | 1,14E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |

## Biogenic carbon content

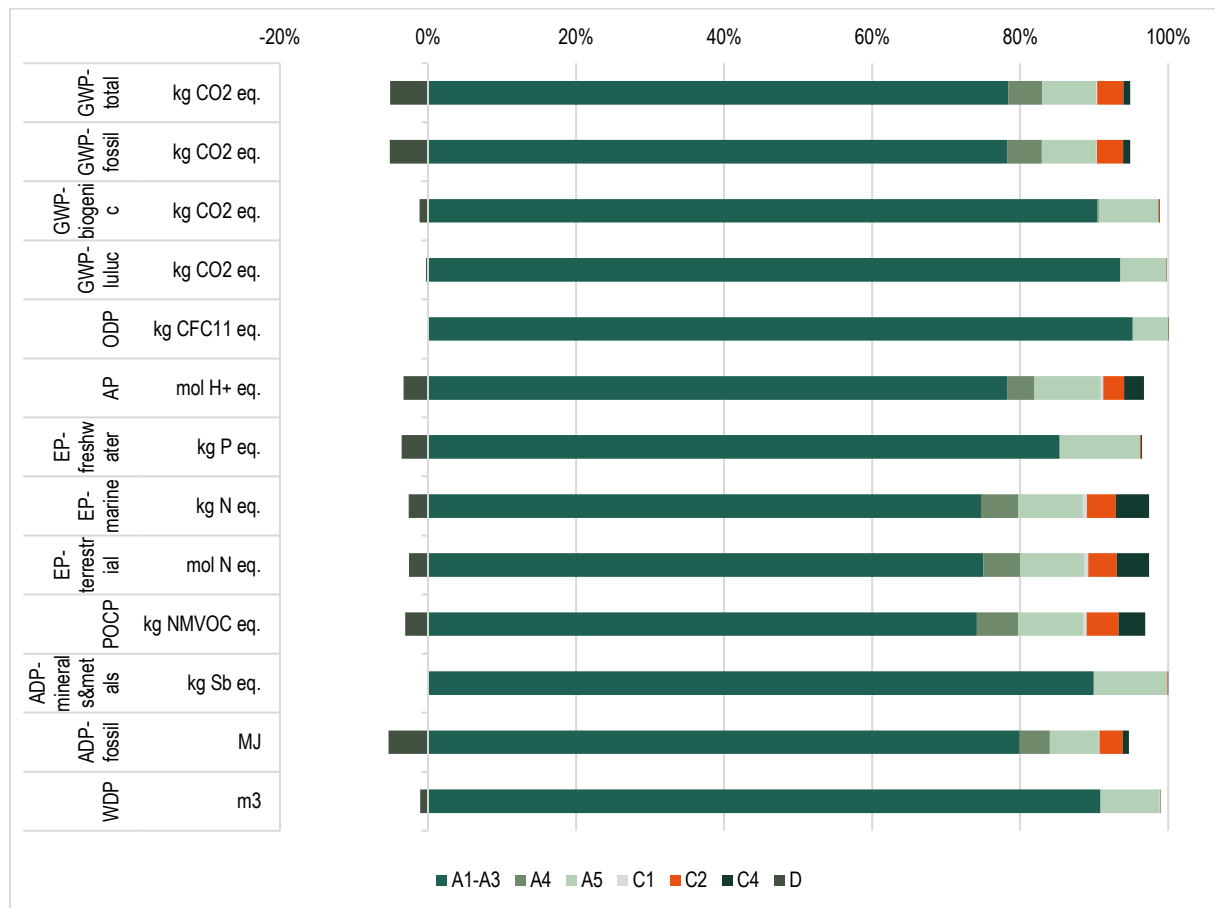
| Results per declared unit – 1 m <sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard |          |
|--------------------------------------------------------------------------------------------------|----------|
| Biogenic carbon content                                                                          | Quantity |
| Carbon content in product, kg C                                                                  | 1,68E-01 |
| Carbon content in accompanying packaging, kg C                                                   | 1,41E-01 |

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>

## LCA Interpretation

The estimated impact assessment results are only relative statements that do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins, or risks.

Contribution to environmental impact per each module for the declared unit of **1 m<sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard** is displayed in following Figure:



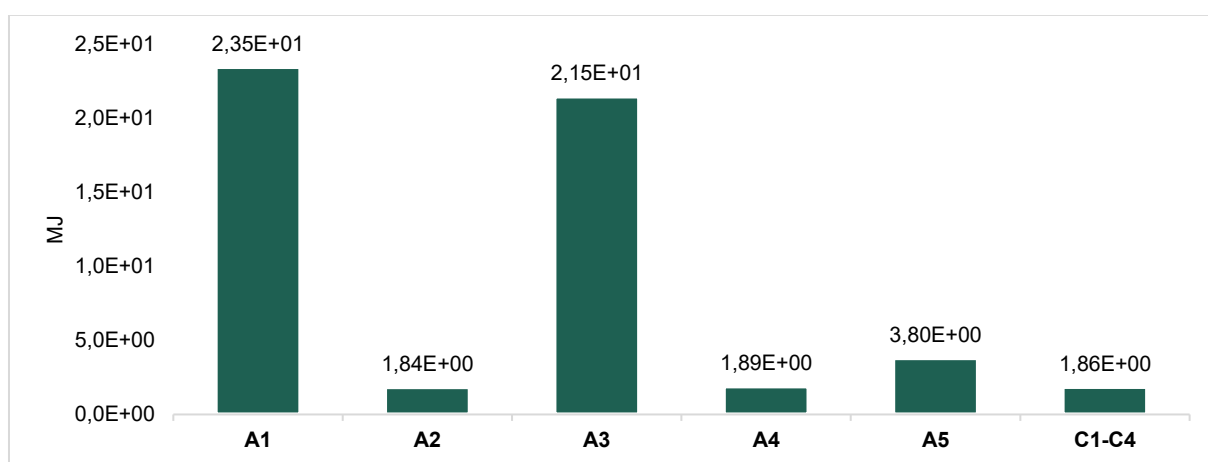
**Contribution to environmental impact per each module for 1 m<sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard**

With regard to Climate change, the highest impact is generated in Raw material module A1 and Manufacturing module A3, resulting in respective 46% and 32% shares of the total impact, while whole **Product stage A1-A3 is generating 83%**. Since considered product is intended for Baltic states, Installation/Construction stage A4-A5 is generating less significant share, resulting only in 12% of the total Global warming potential. End-of-Life stage C1-C4 is generating 5% of the total GWP impact, representing demolition, transportation and landfilling activities. Without any exclusions **Product stage A1-A3 is the main driver** for all considered impact categories.

Nevertheless, it is necessary to note that there is a positive impact of module, especially in such impact categories as Global warming potential, Abiotic depletion potential (fossil) and Eutrophication potential (freshwater). Module D accounts for avoided impact of generated energy, both Electric and Thermal, from incineration of packaging materials (A5) and partial recycling of such packaging materials as steel, paperboard and plastic

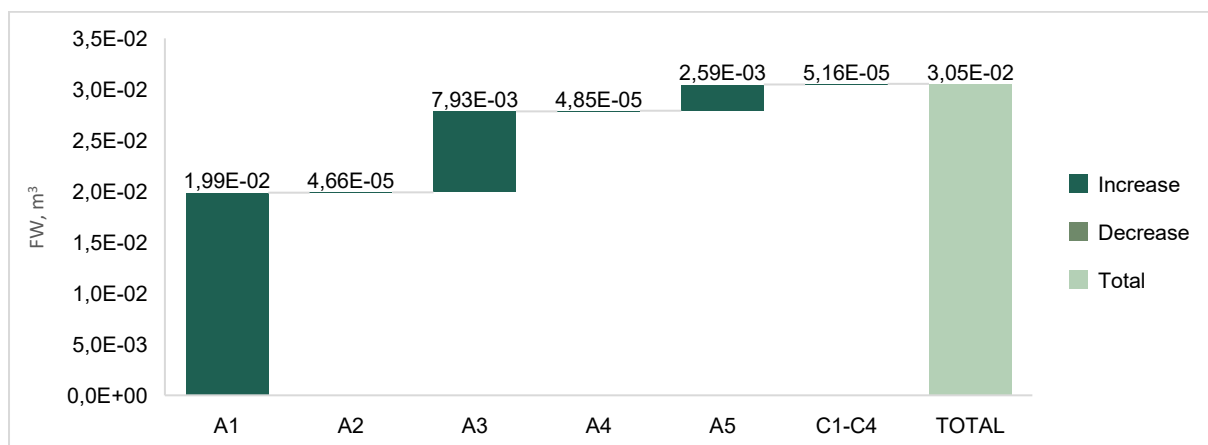
Considering total demand of primary energy per declared unit, that has been calculated using Cumulative Energy Demand (LHV) V1.01 impact assessment method, demand of primary energy is displayed in following Figure. With 86.1% resulting in Product stage (A1-A3), demand of primary energy for **1 m<sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard** is distributed as follows:

- 43.2% for Raw material (A1)
- 3.4% for Transport (A2)
- 39.5% for Manufacturing (A3)
- 3.5% for Transport (A4)
- 7.0% for Installation module (A5)
- 3.5% for End-of-Life stage (C1-C4)



**Primary energy demand per 1 m<sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard**

Other key effect factor is Freshwater consumption, that is displayed in following Figure as a Waterfall chart. A waterfall chart shows a running total as values are added or subtracted. It's useful for understanding how an initial value of net Freshwater use is affected by a series of positive and negative values. In case of **1 m<sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard**, no decrease has been observed in any of considered stages. Similarly to Primary energy demand, in terms of freshwater use level Product stage (A1-A3) is also responsible for most of its demand. The second biggest contributor is Manufacturing module A3, with other declared modules generating less insignificant impact.



**Net freshwater use for 1 m<sup>2</sup> of installed Knauf Green 12.5mm gypsum plasterboard**

## VERSION HISTORY

Original Version of the EPD, 2025-07-30

## ADDITIONAL ENVIRONMENTAL, SOCIAL AND ECONOMIC INFORMATION

The Knauf factory in Saurieši, Latvia, uses natural gypsum sourced from a quarry located just 7 km away from the production site. This proximity significantly reduces the environmental impact of transportation and associated GHG emissions. The production process incorporates sustainable practices, including the recycling of gypsum boards, enabling the return of materials into the production cycle and minimizing waste.

The factory is certified under ISO 14001:2015, demonstrating the company's commitment to reducing environmental impact and efficiently managing resources and energy. Additionally, Knauf actively participates in the CO<sub>2</sub> emissions trading system, supporting global efforts to combat climate change.

Our products comply with EU REACH regulations and do not contain hazardous substances exceeding 0.1% of the product's weight. Furthermore, the products feature very low levels of volatile organic compounds (VOC) (<0.2 mg/m<sup>2</sup>.h), in line with EN ISO 16000 classification, contributing to a healthier indoor environment.

The Knauf factory in Saurieši employs 200 staff members, providing stable employment in the local region. The company's annual turnover amounts to 100 million euros, underscoring its significant contribution to the Latvian economy.

Knauf invests actively in employee education and development, offering training programs and workplace safety initiatives that comply with ISO 45001:2018 standard. As part of its corporate social responsibility, Knauf supports local community projects, including educational initiatives and environmental protection activities.

The company's core values include sustainability, innovation, and collaboration, ensuring the delivery of high-quality building materials with added value for both local and international customers.

## ABBREVIATIONS

| Abbreviation    | Definition                                                                             |
|-----------------|----------------------------------------------------------------------------------------|
| C               | Carbon                                                                                 |
| CO <sub>2</sub> | Carbon dioxide                                                                         |
| CPA             | Statistical classification of products by activity                                     |
| CPC             | Central product classification                                                         |
| c-PCR           | Complementary Product Category Rules                                                   |
| CPV             | Common Procurement Vocabulary code                                                     |
| DIN             | Deutsche Industrie Norm                                                                |
| DQR             | Data quality ratio                                                                     |
| DU              | Declared unit                                                                          |
| EF              | Environmental footprint                                                                |
| EN              | European Norm                                                                          |
| EPD             | Environmental Product Declaration                                                      |
| EU              | European Union                                                                         |
| GHG             | Greenhouse gas                                                                         |
| GLO             | Global                                                                                 |
| GPI             | General Programme Instructions                                                         |
| GWP             | Global warming potential                                                               |
| ISO             | International Organization for Standardization                                         |
| LCA             | Life Cycle Assessment                                                                  |
| LCI             | Life cycle inventory                                                                   |
| LHV             | Lower heating value                                                                    |
| LV              | Latvia                                                                                 |
| ND              | Module not declared                                                                    |
| PCR             | Product Category Rules                                                                 |
| PP              | Polypropylene                                                                          |
| PPP             | Polluter pays principle                                                                |
| REACH           | Regulation on the registration, evaluation, authorization and restriction of chemicals |
| SVHC            | Substances of Very High Concern                                                        |
| UN              | United Nations                                                                         |
| UNSPSC          | United Nations Standard Products and Services Code                                     |
| VOC             | Volatile organic compounds                                                             |

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