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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

- in accordance with ISO 14025, ISO 21930:2017 and EN 15804:2012+2013:A1

Owner of the declaration:	Saint-Gobain Denmark A/S, ISOVER
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
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Issue date:	04.01.2021
Valid to:	04.01.2026

ISOVER Formstykker λ37

Saint-Gobain Denmark A/S, ISOVER

www.epd-norge.no

General information

Product
ISOVER Formstykker λ37

Program operator
The Norwegian EPD Foundation
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Declaration number
NEPD-2612-1324-EN

ECO Platform reference number

This declaration is based on Product Category Rules
CEN Standard EN 15804:2012 + 2013:A1 serve as core PCR. The Product Category Rules, NPCR Construction products and services – Part A – (2017) and NPCR 012 Thermal insulation products – Part B (2018) are used in addition to the core PCR.

Statement of liability
The owner of the declaration shall be liable for the underlying information and evidence.
EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Declared unit
1 m² with a thermal resistance of 1,0 m²K/W with a thickness of 37 mm.

Functional unit
1 m² with a thermal resistance of 1,0 m²K/W with a reference service life of 60 years.

Verification
Independent verification of calculation data and other environmental information and test of the computer program was carried out by Martin Erlandsson in accordance with ISO14025, 8.1.3 and 8.1.4 + EN 15804:2012+2013:A1

☑ Externally

Martin Erlandsson
IVL Swedish Environmental Research Institute
(Independent verifier approved by EPD Norway)

Owner of the declaration
Saint-Gobain Denmark A/S, ISOVER

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Manufacture
Saint-Gobain Denmark A/S, ISOVER

Place of production
Vamdrup, Denmark

Place of usage
Denmark

Management system
DS/EN ISO 9001
DS/EN ISO 14001
DS/EN ISO 50001
DS/ISO 45001

Org. No.
1020917543

Issue date
04.01.2021

Valid to
04.01.2026

Year of study
2018

Comparability
EPD of construction products may not be comparable, if they do not comply with EN15804:2012 +2013:A1 and seen in a building context.

The EPD has been worked out by
The EPD has been worked out by the use of the EPD tool GaBi, version 8.7 by Saint-Gobain LCA central team and by Helene Løvkvist Andersen, Saint-Gobain Denmark A/S.

Company-specific data has been verified by Saint-Gobain central LCA team and by Hans Ramsing Orehøj, Saint-Gobain Denmark A/S, ISOVER

Approved

Håkon Hauan
Managing Director of EPD-Norway

Product description

Product description and description of use:

This EPD describes the potential environmental impacts of 1 m² of glass wool insulation, ISOVER Formstykker λ37, with a thermal resistance equal to 1,00 m^2K/W

The intended use of this EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

ISOVER glass wool products are CE-labelled according to EN 13162 (2012) "*Thermal Insulation Products for Buildings. Factory made mineral wool (MW) Products. Specification*", and EN 13172 (2011) "*Thermal Insulation Products – Evaluation of Conformity*"

The production site of Saint-Gobain Denmark A/S, ISOVER in Vamdrup, Denmark, uses a small amount of natural and abundant raw materials (sand, soda, limestone, feldspar) and a high share of recycled glass cullets (more than 50 % of external glass cullets). This material is converted by using fusion and fiberizing techniques to produce glass wool. The products obtained come in the form of "mineral wool slabs, rolls or lamellas" consisting of a soft, airy structure.

On Earth, naturally, the best insulator is dry immobile air at 10 °C: its thermal conductivity factor, expressed in λ, is 0,025 W/(mK) (watts per meter Kelvin degree). The thermal conductivity of mineral wool is close to immobile air as its lambda varies from 0,030 W/(mK) for the most efficient, to 0,040 W/(mK) to the least efficient.

With its entangled structure, glass wool is a porous material that traps the air, making it one of the best insulating materials. The porous and elastic structure of the wool also absorbs airborne noise, impact noise and offers acoustic correction inside premises.
Glass wool containing incombustible materials does not react to fire.

Glass wool insulation is used in buildings as well as industrial facilities. It ensures a high level of comfort and minimizes carbon dioxide (CO_2) emissions by preventing heat loss through roofs, walls, floors, pipes and boilers. It reduces noise and protects homes and industrial facilities against fire.

Correctly installed glass wool products and solutions do not require maintenance, and last throughout the lifetime of the building (which is set at 60 years as a default value in the model), or as long as the insulated building component is a part of the building.

Technical data/physical characteristics:

The thermal resistance of the product: 1,00 m^2K/W
The thermal conductivity of the product: 0,037 W/(mK)
Reaction to fire: Euroclass A1

Description of the main product components and/or materials:

Mineral wool	92-100 %	(REACH registration number 01-2119472313-44-0039)
Binder	≤ 8 %	

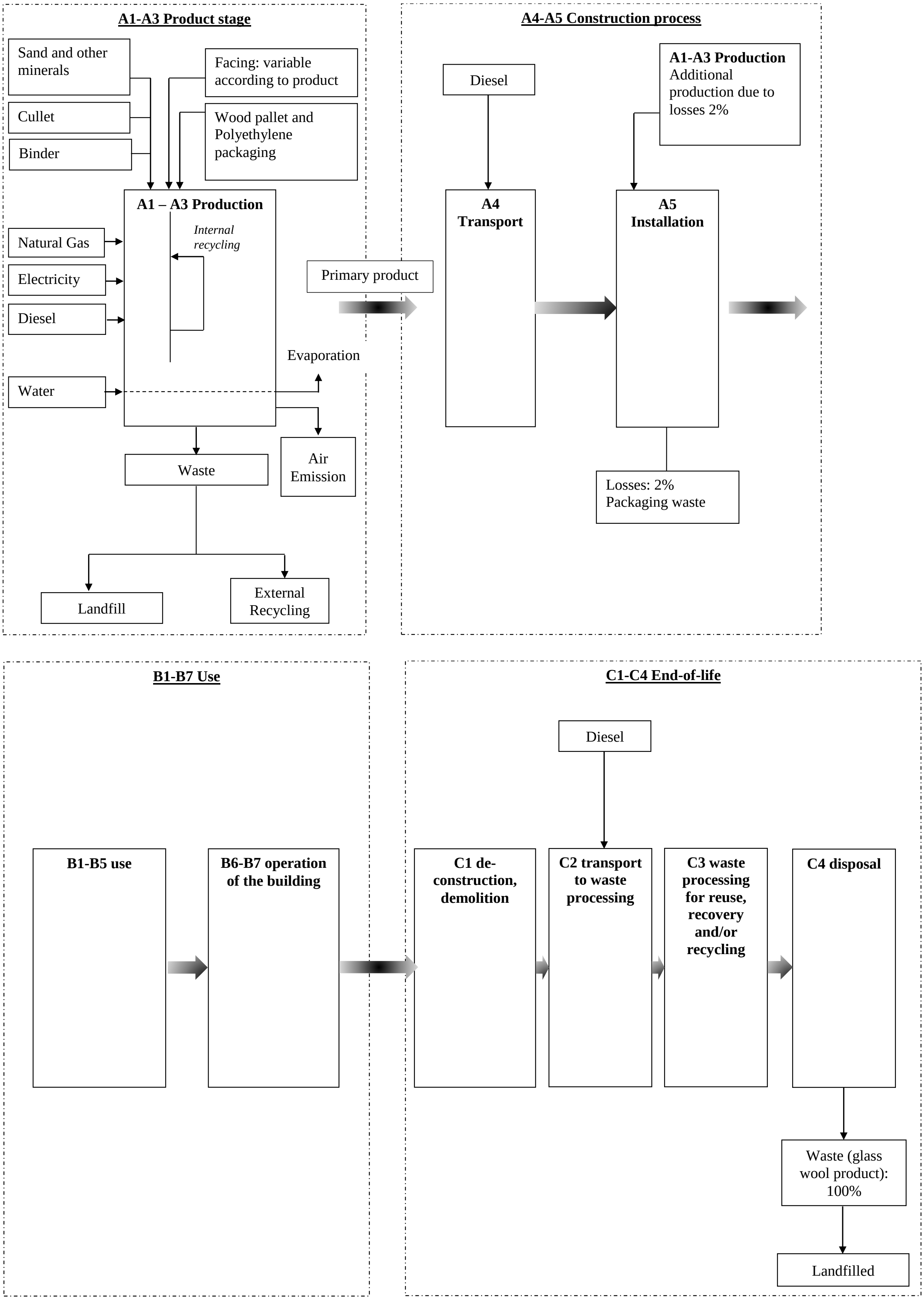
Description of the main components and/or materials for 1 m^2 of product with a thermal resistance of 1 m^2K/W for the calculation of the EPD:

PARAMETER	VALUE
Quantity of mineral wool	555 g
Thickness of mineral wool	37 mm
Surfacing	None
Packaging for the transportation and distribution	Polyethylene 16 g/m^2 Wood pallet 55 g/m^2
Product used for the Installation	None

LCA calculation information

FUNTIONAL UNIT	Providing a thermal insulation on 1 m^2 with a thermal resistance of equals 1 m^2K/W
SYSTEM BOUNDARIES	Cradle to Grave
REFERENCE SERVICE LIFE (RSL)	60 years (with correct installation, the product has same RSL as the building component)
CUT-OFF RULES	See detailed explanation page 10
ALLOCATIONS	See detailed explanation page 10
ELECTRICITY USED FOR THE MANUFACTORING PROCESS	Renewable electricity mix (reference year 2018) GO's from LOS, contracted 2018 – 2020, to be prolonged to be valid at least equal to the validity of this EPD.
GEOGRAPHICAL COVERAGE AND TIME PERIOD	Denmark, 2018
GREENHOUSE GAS EMISSION FROM ELECTRICITY	Which equals 0,035 kg CO_2 equiv /kWh

Flow diagram of the Life Cycle



System boundaries (X = included, MND = Module not declared)																	
Product stage			Construction installation stage		Use stage							End of life stage					Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Construction installation stage	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal		Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		MND

Product stage, A1- A3

Description of the stage:

The product stage of the mineral wool products is subdivided into 3 modules A1, A2 and A3 respectively “Raw material supply”, “transport” and “manufacturing”.

The aggregation of the modules A1, A2 and A3 is a possibility considered by the EN 15804:2012+2013:A1 standard. This rule is applied in this EPD.

A1, Raw material supply

This module takes into account the extraction and processing of all raw materials and energy which occur upstream to the studied manufacturing process.

Specifically, the raw material supply covers production of binder components and sourcing (quarry) of raw materials for fiber production, e.g. sand and borax for glass wool. Besides these raw materials, glass cullet is also used as input.

About cullet: The main raw material for the production of glass insulation material is cullets or/and sand. Only specific cleaning activities and transport is included for the cullets – and thus not the impacts from the full life cycle of glass. The reason is that cullets are considered a waste product and not initially produced for the purpose of glass wool insulation production.
The only activities included are:

- Magnetic separation of metallic piece
- Separation of other piece-crushing of glass (<20 mm)
- Separation of bottle cap crushing (<2 mm) sieving
- Transport

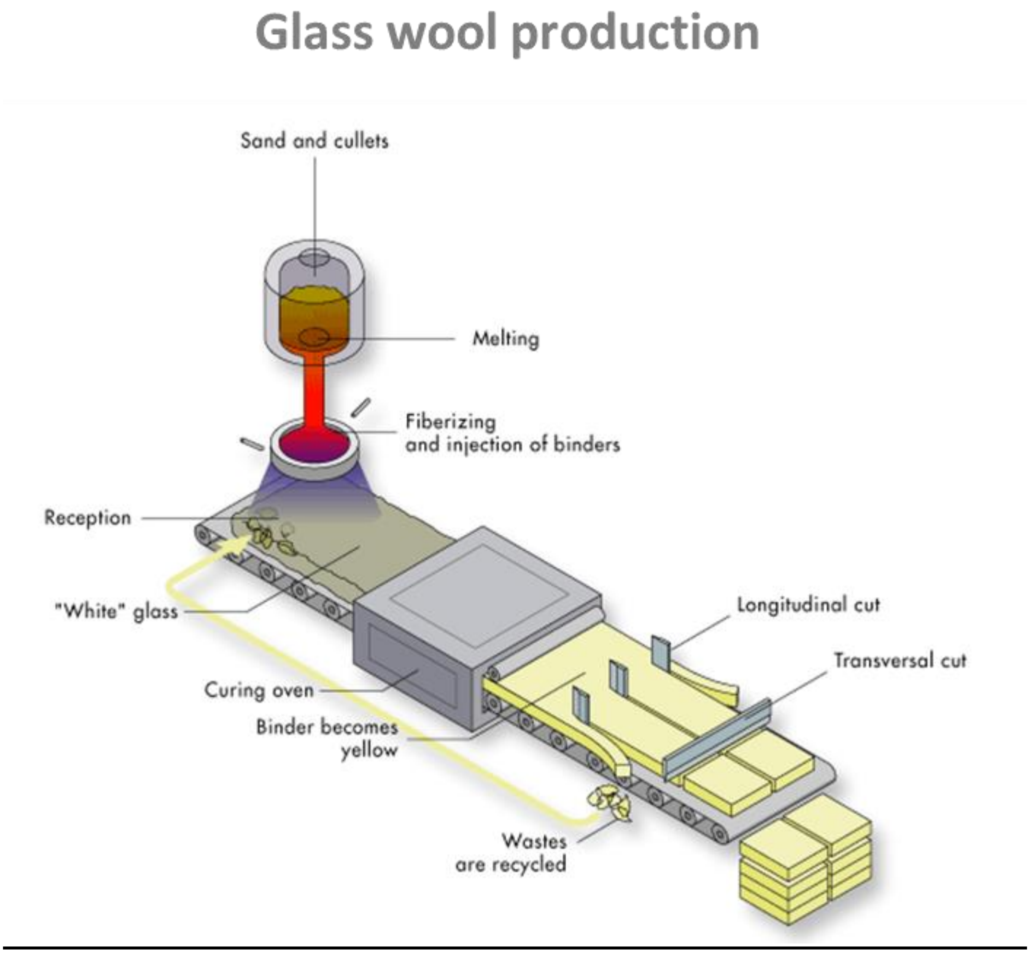
A2, Transport to the manufacturer

The raw materials are transported to the manufacturing site. In our case, the modeling includes: road and boat transportations (specific values) of each raw material.

A3, Manufacturing

This module covers glass wool fabrication, including melting and fiberizing (see process flow diagram). In addition, the production of packaging material is taking into account at this stage.

Manufacturing process flow diagram



Construction process stage, A4- A5

Description of the stage:

The construction process is divided into 2 modules: A4, transport to the building site and A5, installation in the building.

Description of scenarios and additional technical information:

A4, Transport to the building site:

This module includes transport from the production gate to the building site.
Transport is calculated on the basis of a scenario with the parameters described in the following table.

PARAMETER	VALUE
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.	Average truck trailer with a 24t payload, diesel consumption 38 liters for 100 km
Distance	125 km
Capacity utilisation (including empty returns)	18 % of the capacity in weight 30 % of empty returns capacity in weight
Bulk density of transported products	15 kg/m^3 (uncompressed density)
Weight capacity utilisation factor	0,415 (by default)

A5, Installation into the building:

This module includes:

- Wastage of products: 2 %. These losses are landfilled (landfill model for glass, see chapter End-of-life)
- Additional production processes to compensate for the loss
- Processing of packaging wastes: they are 100 % collected and modeled as recovered matter.

This module does not include:

- Energy for installation of the insulation, as the installation is done manually, and do not require energy.

PARAMETER	VALUE
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	2 %
Output materials (specified by type) as results of waste processing at the building site e.g. of collection for recycling, for energy recovering, disposal (specified by route)	Packaging wastes are 100 % collected and modeled as recovered matter Glass wool losses are landfilled

Use stage (excluding potential savings), B1- B7

Description of the stage:

The use stage is divided into the following modules:

- B1: Use
- B2: Maintenance
- B3: Repair
- B4: Replacement
- B5: Refurbishment
- B6: Operational energy use
- B7: Operational water use

Description of scenarios and additional technical information:

Once installation is complete, no actions or technical operations are required during the use stages until the end-of-life stage. Therefore, glass wool insulation products have no impact (excluding potential energy savings) on this stage.

End-of-life stage, C1- C4

Description of the stage:

The stage includes the following different modules of end-of-life:

C1, De-construction, demolition

The de-construction and/or dismantling of insulation products are part of the demolition of the entire building, and are assumed to be made manually. In our case, the environmental impact is assumed to be very small and can be neglected.

C2, Transport to waste processing

Transport is included and calculated on the basis of a scenario with the parameters described in the End-of-life table below.

C3, Waste processing for reuse, recovery and/or recycling

Today the product is considered to be landfilled without reuse, recovery or recycling.

C4, Disposal

The glass wool is assumed to be 100% landfilled.

Description of scenarios and additional technical information: See below

PARAMETER	DESCRIPTION
Collection process specified by type	The entire insulation product (wool) is collected with mixed construction waste
Recovery system specified by type	No re-use, recycling or energy recovery
Disposal specified by type	The entire insulation product (wool) is landfilled
Assumptions for scenario development (e.g. transportation)	Average truck trailer with a 24t payload, diesel consumption 38 liters for 100 km. 25 km (default distance from the building site to landfill).

Reuse/recovery/recycling potential, D

Description of the stage: For module D we only take into consideration the materials used for the product, and not e.g. packaging. The environmental impact of recycling is therefore set to 0.

LCA results

LCA model, aggregation of data and potential environmental impact are calculated from the GaBi software 8.7 and CML impact method has been used, together with Thinkstep 8.7 (2018) and ecoinvent V3.1 (2014) databases to obtain the inventory of generic data.
Following the “Default international characterization method” specified in ISO21930:2017, biogenic carbon is not reported in the context of GWP-GHG.

Raw materials and energy consumption, as well as transport distances, have been taken directly from the manufacturing plant of Saint-Gobain Denmark A/S, ISOVER in Vamdrup (Production data according 2018).

Resume of the LCA results detailed on the following tables.

Cut-off criteria

The cut-off criterion used in Saint-Gobain EPD will be the mass criterion with the following details:

- Taking into account all input and output flows in a unit process i.e. taking into account the value of all flows in the unit process and the corresponding LCI whenever available
- No simplification of the LCI by additional exclusions of material flows

Data collected at the manufacturing site was used. The inventory process in this LCA includes all data related to raw material, packaging material and consumable items, and the associated transport to the manufacturing site. Process energy and water use, direct production waste and emissions to air and water are included. Scenarios have been developed to account for downstream processes such as demolition and waste treatment in accordance with the requirements of EN 15804:2012+A1:2013

All inputs and outputs to the manufacturing plants have been included and made transparent. All assumptions regarding the materials and water balances have also been included.

All hazardous and toxic materials and substances are considered in the inventory even though they are below the cut off criteria.

There are excluded processes in the inventory:

- Flows related to human activities, such as employee transport and administration activity, are according to the PCR not accounted for.

Allocation

Allocation criteria are based on mass.

The allocation of all the air emissions, wastes and energy usage are based on mass (kg). The reason we can use a mass basis is because we use the exact same manufacturing process shown for every product. We only produce glass mineral wool at the Vamdrup site using the same process and therefore all the factors can be allocated by a mass basis.
The amount of binder varies for different products, and is accounted for.

A mass balance was conducted for the 2018 production year to ensure that we haven’t excluded any materials, emissions and hence potential environmental impacts. Regarding the mass balance, all the raw materials and corresponding production goods and wastes generated were taken into account.

Influence of particular thicknesses

The results in the tables of this EPD refer to ISOVER Formstykker λ37 with a thickness of 37 mm for a functional unit of 1 m² with a thermal resistance equals to 1,00 m²K/W

This EPD includes a range of thicknesses between 45 mm and 300 mm.
For every thickness, use a multiplication factor in order to obtain the environmental performance of every thickness. Using the thickness factor will for some indicators give higher values than calculated for the specific thickness in GaBi.

In order to calculate the multiplication factors, a reference unit has been selected (value of R= 1,00 m²K/W for 37 mm). Multiplication factors are obtained by making the LCA calculations for all thicknesses, including packaging.

In order to obtain the environmental performance associated with the specific product and thickness, the results expressed in this EPD must be multiplied by its corresponding multiplication factor.

PRODUCT THICKNESS (mm)	THERMAL RESISTANCE	MULTIPLICATION FACTOR
37	1.00	1.00
45	1.216	1.22
70	1.892	1.89
95	2.568	2.52
120	3.243	3.18
145	3.919	3.84
170	4.596	4.48
195	5.270	5.16
250	6.757	6.96
300	8.108	8.38

Influence of transportation to others countries

The results of stage A4 (transportation of product) in the table of this EPD refer to transportation in Denmark. This product might also be delivered to the countries in the table below. In order to adapt the impact of transportation to other countries, the A4 figures from the current EPD shall be multiplied by the multiplication factors below.

COUNTRY	AVERAGE DISTANCE	MULTIPLICATION FACTOR
Denmark	125 km (truck)	1,00
Norway	777 km (truck) 100 km (boat)	6,34
Sweden	761 km (truck), 10 km (boat)	6,10
Finland	389 (truck), 1225 km (boat)	4,68

Transport include transportation to ISOVER plant, and average distance from plant to building site.

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) - *kg CO_2 equiv/FU*	4,41E-01	6,48E-03	5,02E-04	0	0	0	0	0	0	0	0,00E+00	3,21E-03	0	8,68E-03	0
	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*	3,91E-08	9,90E-19	7,81E-12	0	0	0	0	0	0	0	0,00E+00	2,78E-15	0	4,85E-17	0
	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 SO_2 equiv/FU*	4,12E-03	2,74E-05	2,56E-06	0	0	0	0	0	0	0	0,00E+00	1,34E-05	0	4,95E-05	0
	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.														
Eutrophication potential (EP) *kg $(PO_4)^{3-}$ equiv/FU*	1,49E-03	6,72E-06	7,19E-07	0	0	0	0	0	0	0	0,00E+00	3,26E-06	0	5,61E-06	0
	Excessive enrichment of waters and continental surfaces with nutrients, and the associated adverse biological effects.														
Photochemical ozone creation (POPC) *kg Ethene equiv/FU*	2,55E-04	1,00E-06	1,16E-07	0	0	0	0	0	0	0	0,00E+00	4,99E-07	0	4,08E-06	0
	Chemical reactions brought about by the light energy of the sun. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.														
Abiotic depletion potential for non-fossil resources (ADP-elements) - *kg Sb equiv/FU*	5,99E-05	8,60E-11	1,20E-08	0	0	0	0	0	0	0	0,00E+00	4,34E-11	0	2,95E-09	0
Abiotic depletion potential for fossil resources (ADP-fossil fuels) - *MJ/FU*	6,87E+00	9,01E-02	7,14E-03	0	0	0	0	0	0	0	0,00E+00	4,47E-02	0	1,16E-01	0
	Consumption of non-renewable resources, thereby lowering their availability for future generations.														

RESOURCE USE

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	
Use of renewable primary energy excluding renewable primary energy resources used as raw materials - *MJ/FU*	8,03E+00	2,1E-03	1,8E-03	0	0	0	0	0	0	0	0	1,2E-03	0	1,5E-02	0
Use of renewable primary energy used as raw materials *MJ/FU*	9,36E-01	-	1,9E-04	-	-	-	-	-	-	-	-	-	-	-	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) - *MJ/FU*	8,96E+00	2,1E-03	1,9E-03	0	0	0	0	0	0	0	0	1,2E-03	0	1,5E-02	0
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - *MJ/FU*	7,30E+00	9,0E-02	7,2E-03	0	0	0	0	0	0	0	0	4,5E-02	0	1,2E-01	0
Use of non-renewable primary energy used as raw materials - *MJ/FU*	6,42E-01	-	1,3E-04	-	-	-	-	-	-	-	-	-	-	-	0
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - *MJ/FU*	7,95E+00	9,0E-02	7,4E-03	0	0	0	0	0	0	0	0	4,5E-02	0	1,2E-01	0
Use of secondary material *kg/FU*	3,49E-01	0	7,0E-05	0	0	0	0	0	0	0	0	0	0	0	0
Use of renewable secondary fuels - *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels - *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of net fresh water - *m^3/FU*	6,25E-03	6,9E-07	1,3E-06	0	0	0	0	0	0	0	0	3,7E-07	0	3,0E-05	0

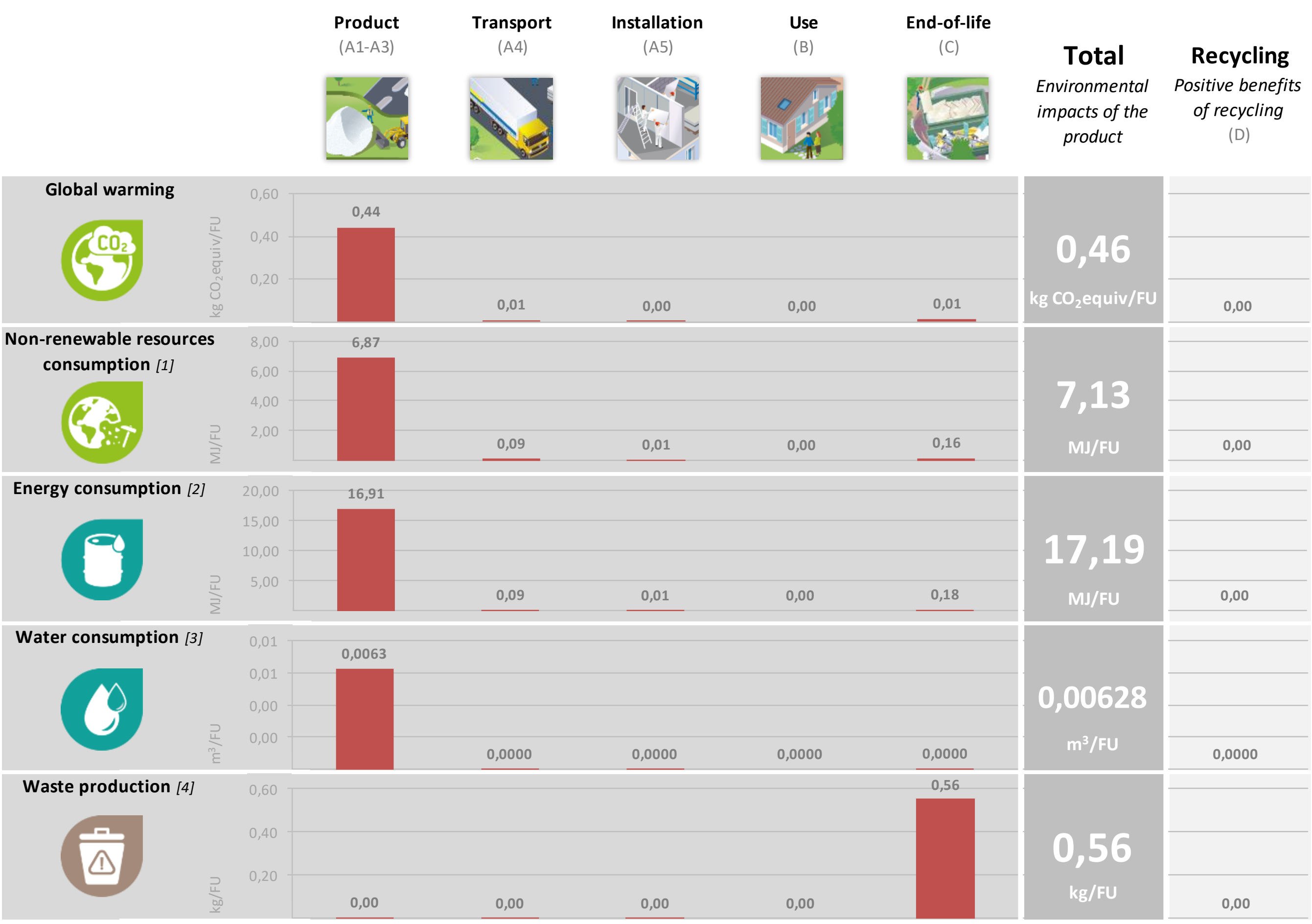
WASTE CATEGORIES

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	
Hazardous waste disposed *kg/FU*	1,54E-08	3,24E-10	2,42E-11	0	0	0	0	0	0	0	0,00E+00	1,61E-10	0	2,04E-09	0
Non-hazardous waste disposed *kg/FU*	3,21E-03	1,10E-06	1,26E-04	0	0	0	0	0	0	0	0,00E+00	5,94E-07	0	5,56E-01	0
Radioactive waste disposed *kg/FU*	5,40E-06	1,05E-07	8,16E-09	0	0	0	0	0	0	0	0,00E+00	5,23E-08	0	1,59E-06	0

OUTPUT FLOWS

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	
Components for re-use *kg/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for recycling *kg/FU*	1,20E-02	0	7,12E-02	0	0	0	0	0	0	0	0	0	0	0	0
Materials for energy recovery *kg/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy *MJ/FU*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LCA interpretation



[1] This indicator corresponds to the abiotic depletion potential of fossil resources.
[2] This indicator corresponds to the total use of primary energy.
[3] This indicator corresponds to the use of net fresh water.
[4] This indicator corresponds to the sum of hazardous, non-hazardous and radioactive waste disposed.

Global Warming Potential (Climate Change) (GWP)

When analyzing the above figure for GWP, it can clearly be seen that the majority of contribution to this environmental impact is from the production modules (A1 – A3). This is primarily because the sources of greenhouse gas emissions are predominant in this part of the life cycle. CO_2 is generated upstream from the production of electricity and is also released on site by the combustion of natural gas. We can see that other sections of the life cycle also contribute to the GWP; however, the production modules contribute to over 80% of the contribution. Combustion of fuel in transport vehicles will generate the second highest percentage of greenhouse gas emissions together the waste during the installation stage.

Non-renewable resources consumptions

We can see that the consumption of non-renewable resources is once more found to have the highest value in the production modules. This is because a large quantity of natural gas is consumed within the factory, and non-renewable fuels such as natural gas and coal are used to generate the large amount of electricity we use. The contribution to this impact from the other modules is very small and primarily due to the non – renewable resources consumed during transportation.

Energy Consumptions

As we can see, modules A1 – A3 have the highest contribution to total energy consumption. Energy in the form of electricity and natural gas is consumed in a vast quantity during the manufacture of glass mineral wool so we would expect the production modules to contribute the most to this impact category.

Water Consumption

As we don't use water in any of the other modules (A4 – A5, B1 – B7, C1 – C4), we can see that there is no contribution to water consumption. For the production phase, water is used within the manufacturing facility and therefore we see the highest contribution here. However, we recycle a lot of the water on site so the contribution is still relatively low.

Waste Production

Waste production does not follow the same trend as the above environmental impacts. The largest contributor is the end of life module. This is because the entire product is sent to landfill once it reaches the end of life state. However, there is still an impact associated with the production module since we do generate waste on site. The following small impact associated with installation is due to the loss rate of product during implementation.

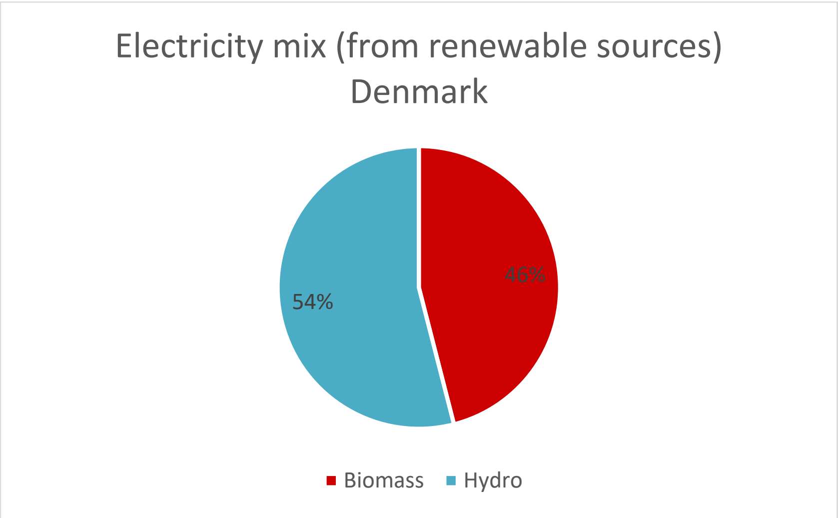
Additional information

Additional Norwegian requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

The LCA calculation has been made taking into account the fact that during the manufacturing process it is used 100% renewable electricity. This 100% renewable electricity bought is evidenced by Guarantee of Origin certificates (GOs) from LOS, valid from 2018 to 2020. Has been prolonged to 2023, and will be prolonged to be valid at least equal to the validity of this EPD.

TYPE OF INFORMATION	DESCRIPTION
Location	Representative of average production in Denmark
Geographical representativeness description	Split of energy sources in Denmark - Hydro: 54% - Biomass: 46%
Reference year	2018
Type of data set	Cradle to gate from Thinkstep database
Source	Guarantee of Origin certificates (GOs) - 2018



The dataset used to model the renewable electricity mix used for these calculations come from thinkstep and ecoinvent database.

DATA SOURCE	AMOUNT	UNIT
thinkstep (2018) and ecoinvent 3.1 (2014)	0,035	kg CO_2 equiv /KWh

Indoor environment

The EPD does not give any information on release of regulated dangerous substances to indoor air, because the national regulation in Denmark does not require any verification and declaration of release of regulated dangerous substances today.

Dangerous substances

The product contains no substances given from the REACH Candidate list (2020)
(REACH registration number 01-2119472313-44-0039)

Bibliography

- Product-Category Rules:
  - NPCR Construction products and services – Part A (2017)
  - NPCR 012 Thermal insulation products – Part B (2018)
- Environmental labels and declarations - Type III environmental declarations -Principles and procedures (ISO 14025:2006)
- Environmental management - Life cycle assessment – Requirements and guidelines (ISO 14044:2006)
- Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products (EN 15804:2012+2013:A1)
- Sustainability in building construction - Environmental declaration of building products (ISO 21930:2017)
- LCA report Saint-Gobain ISOVER 2020, author: Saint-Gobain + Saint-Gobain Denmark A/S
- Ecoinvent database V3.1 (2014)
- GaBi 8.7 - database (2018)
- Guarantee of Origin certificates (GOs) from LOS, issued to Saint-Gobain (2018)

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