Environmental Product Declaration

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

Glass fiber window door OD

from

Orama i Lysekil AB

ORAMA Fönstret

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-09770
Publication date:	2023-07-13
Valid until:	2028-07-14

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

EPD®

ECO PLATFORM EPD VERIFIED

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm, Sweden
Website:	www.environdec.com
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14, Construction Products, version 1.2.5 and c-PCR-007, windows and doors (EN 17213:2020) version 2020-04-09 UN CPC code: 3712 Glass fibres and articles thereof, except woven fabrics
PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact
Life Cycle Assessment (LCA)
LCA accountability: *Viktor Hakkarainen, VästLCA AB*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via EPD verification by individual verifier Third-party verifier: *Carolina Scarinci*      Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

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

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same 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 equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Contact information

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Programme Operator	**EPD International AB** **info@environdec.com**

Company information

Description of the organization

ORAMA is a family business operating from a single site out of Lysekil founded by Arne Karlsson. After 5 years of development, the first windows were produced in 1998 with unique properties based on a construction that can withstand tough environments.

Arne had previously worked with fittings and windows since the 1960s. All these years of experience led Arne to discover which properties are required for an optimal and durable window construction. This unique experience has laid the foundation for the ORAMA window.

Scorching sun and salty winds in the summer, becomes the complete opposite in autumn and winter when biting cold and stormy winds from the North Sea move in. A place with more demanding conditions for the development of a window can hardly be found & this guarantees an incredibly high quality.

Orama prides itself on its history and reputation, taking good care to foster knowledge and tradition between the generations. Recruiting is done exclusively on good reputation; prioritizing knowing the person in question and having the training done in-house. Orama work to remain and conduct the business here in Lysekil in the same family spirit since the start in 1998.

Product information

Product name
Glass fiber window door OD

Product identification
The product has the following technical properties in accordance with EN 14351-1:2006

Technical properties

Property	Value
Wind resistance class (EN 12211/EN 12210)	3A
U-Value (SS-EN 673)	1.1
G value (EN 410)	50%
LT-value (EN 13363-1 or -2)	72%

Product description
The purpose of the window door is allowing passage of people while allowing daylight to enter the building while maintaining the thermal comfort indoor.

The window door is primarily made of glass, glass fibre composites and aluminium with steel details. They also contain some minor parts of plastics, paint, and rubber. Doors are manufactured in different sizes, tailored to customer requirements, however results displayed in this EPD apply to doors with an area of 3.6m^2 or less.

UN CPC code
3712 Glass fibres and articles thereof, except woven fabrics

Geographical scope
Sweden

LCA information

Functional unit

1 m2 of window door for a RSL of 50 years. The indicator results were calculated for the following standard sized elements and they represent doors with a surface < 3,6m^2.

Property	Value	Comment
Size	2,68 m^2	Windows with an area of 3,6 m^2 or less are included in this EPD.
Dimensions	1230x2180 mm	
Weight	81,4 kg	
Weight per m^2	30,4 kg	

Reference service life

50 years.
Declared according to guidance in EN 17213 chapter 6.3.3. It is assumed that the maintenance, installation, and servicing is performed as per manufacturer's instructions.

Time representativeness

Specific data collected for production taking place in 2021. All used datasets are currently valid.

Database(s) and LCA software used

LCA software: SimaPro version 9.5
Database: Ecoinvent 3.9.1

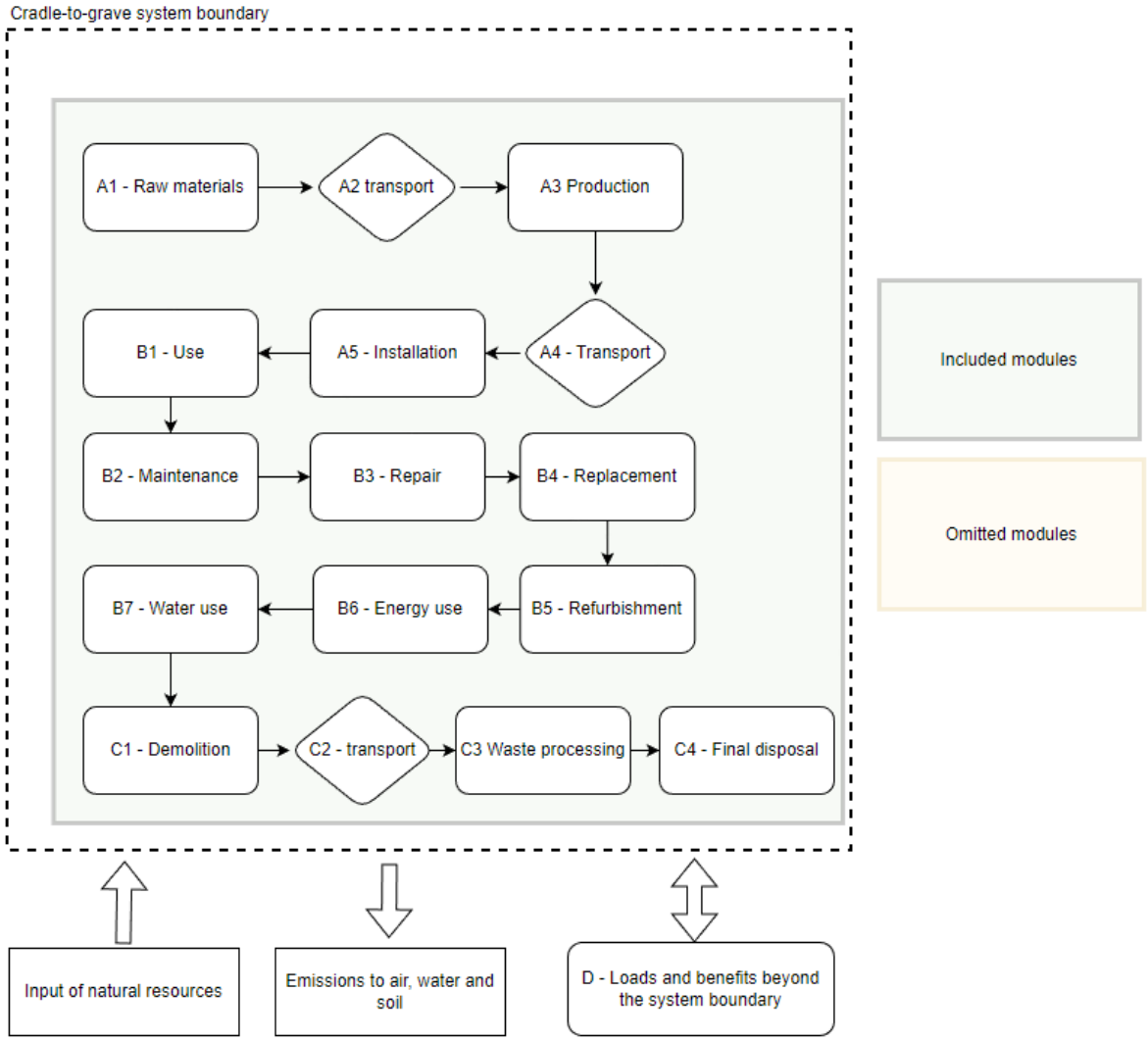
Description of system boundaries

c) Cradle to grave and module D (A + B + C + D);

The system boundary to nature is set to include those processes that provide the material and energy inputs into the system and all following manufacturing, and transport processes as well as the processing of any waste arising from those processes.

A linear system with the exchanges to nature (input of raw resources and energy as well as emissions) can be seen below.

System diagram



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

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	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-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	X	X	X	X	X	X	X	X	X	X	X	X
Geography	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Specific data used	<10%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

X = Modules declared
ND = Modules not declared

A brief description of the modules is presented below:

Module	Included Activities
A1	Raw material extraction and processing required until the material is ready to be delivered to Orama.
A2	Transports from the manufacturers to Orama. Only road transports are used.
A3	Energy use, consumables, direct emissions, treatment of waste and packaging needed to produce the doors at Orama manufacturing facility in Lysekil.
A4	Transports from Orama to customers. Only road transports are used.
A5	Screws for fastening and disposal of packaging
B1-B7	Only B2 has any activity. Change of insulated glass unit (IGU), Raw material extraction and processing of lubrication oil and cleaning consumables is included.

C1	No activities are needed to deconstruct the products.
C2	Transport from customer to waste treatment plant. Only road transports are used. Distance is assumed.
C3	Energy and fuel needed for crushing and sorting of the waste as well as internal transports in the waste treatment plant.
C4	Emissions from the final disposal of the waste, either: - Incineration without energy recovery - Landfilling Most of the metal is recycled, the majority of the combustible waste is incinerated with energy recovery.
D	- Material, energy, and fuel to prepare the recycled material to the point of functional equivalence of the replaced primary material. - Material, energy, and fuel needed to transform the energy from the incinerated material to district heating or electricity. Avoided material, energy, and fuel from the replaced primary material, district heating or electricity.

Description of production activities (A3)

For the product, Orama uses pull-extruded fiberglass profiles (pultrusion). The profiles are supplied by Vello, Skodje in Norway. The profiles are delivered fully painted to Orama's factory in Lysekil, where they are processed further before final assembly.

The aluminum parts are extruded by Hydro Extrusion in Vetlanda, the profiles come powder coated which are cut and further processed for final assembly in the premises in Lysekil. Glass cassettes are purchased from Elitfönster, IGF in Lenhovda. The flat glass is supplied from the largest European manufacturers. The glass cassettes are then assembled together with the aluminum and fiberglass profiles into the final product in Orama's factory in Lysekil.

The finished windows are packaged on self-made pallets made of solid wood and plywood. The finished packaged windows are finally transported to the customer by truck.

Assumptions

- Transports are assumed to be performed by Euro 5 class vehicles.
- Average transport distance to customers is assumed to be 300 km
- Average transport distance to waste treatment is assumed to be 200 km
- The replaced IGU in module B2 is assumed to be transported 300 km with a 7,5-16 ton class vehicle
- Reported broken material is assumed to be glass
- It is assumed that the steel has an average recycled content of 19,9%, extrapolated from the input of steel scrap in the Ecoinvent 3.9.1 dataset “Steel, low-alloyed {RER}| steel

production, converter, low-alloyed | Cut-off, U", this is not reported as recycled content in the EPDs.

Cut-off rules

The cut-off criteria are in accordance with the EN 15804 standard, meaning that max 1% of the renewable and non-renewable primary energy use and max 1% of the total mass input of a specific unit process are allowed to be cut-off (excluded).

For a full module (A1, A2 etc) the summarized cut-off of all unit processes are max 5% of the entire module.

Particular care was taken to include material and energy flows known to have the potential to cause significant emissions into air and water or soil related to the environmental indicators of EN 15804+A2.

In this study, the following flows are deemed to be below cut-off:

- Use of hand tools for deconstruction in A5

Allocation

Allocation is performed according to the allocation hierarchy in EN 15804 chapter 6.4.3.2, that is:

1. Avoid allocation by dividing the unit process into different sub-processes.
2. When the difference in revenue from the co-products is low, allocate based on underlying physical relationships (e.g., mass or volume).
3. In all other cases allocation shall be based on economic value

This LCA uses step 2 allocation based on the number of produced units adjusted to the size in m^2. The flows that required allocation are use of energy and generation of waste in module A3.

Data quality

Data Quality	Data Quality Assessment
Time related coverage	**Upstream:** Very Good as all datasets are currently valid, and the collected quantities are from 2021. **Core:** Very Good as all datasets are currently valid, and the collected quantities are from 2021. **Downstream:** Good as most datasets are currently valid, sources for waste treatment are more than 3 years old but less than 6.
Geographical coverage	**Upstream:** Fair, datasets with most impact such as metals, plastics and glass are from SE or the European region which can be consider similar to Swedish conditions. Some datasets are originating from a global geography. **Core:** Fair, datasets are from SE or the European region which can be consider similar to Swedish conditions. **Downstream:** Fair, datasets are from SE or the European region which can be consider similar to Swedish conditions.

Technology coverage	**Upstream:** Good, all datasets are taken from the latest ecoinvent version (3.9.1) or from valid EPDs. Datasets have been chosen to closely relate to the actual conditions. **Core:** Good, all datasets are taken from the latest ecoinvent version (3.9.1) or from valid EPDs. Datasets have been chosen to closely relate to the actual conditions. **Downstream:** Good, all datasets are taken from the latest ecoinvent version (3.9.1) or from valid EPDs. Datasets have been chosen to closely relate to the actual conditions.
Other Data Quality indicators	
Precision	The variance is shown in the uncertainty analysis. The variance is inherent to the ecoinvent database.
Completeness	All known flows are accounted for.
Representativeness	The data has been chosen to specifically reflect the true conditions; it is not within the scope of the project to verify the upstream value chain, but the chosen datasets should reflect this as accurately as possible within the scope of the project.
Consistency	The same methodology has been uniformly used (100% cut-off system library and allocation based on physical properties (size) has been used.
Reproducibility	The LCA is reproducible with all data reported in this report. No other data was used then what is reported in this document.
Data sources	Data collection method is described in the LCI chapter, and all datasets are referenced.
Data uncertainty	Uncertainty has been assessed through a sensitivity analysis for the most relevant assumptions and an uncertainty analysis for the variance of the datasets.

Scenarios

Presented scenarios in for modules B-D are currently in use and are representative for one of the most probable alternatives.

B2 – Maintenance

Activity	Amount per FU
Lubricating oil	10 ml/year
Cleaning fluid	10 ml/year
Water	5 l/year

As modern insulated glass units have become more advanced, it is today standard practice to account for a 50-year lifespan for insulation glass (Carlsson, 2005) , this means that there is no need to change the IGU after 30 years, as it has not yet fulfilled its lifespan.

C1 – Demolition/deconstruction
No activities.

C2 – Transport to waste treatment

Activity	Transport type	km
Transport	Road	200

C3 - Waste pre-processing

Activity	Amount per FU
Internal Transports	12,75 kgkm
Electricity for sorting	0,79 kWh
Steel sent to recycling	85%
Aluminum sent to recycling	85%
Waste sent to incineration with energy recovery	100%
Packaging sent to incineration with energy recovery	100%

Remaining steel and aluminum is assumed to be landfilled.

C4 – Final Disposals

Material	Waste type	Amount per FU
Non-recycled metals and glass	Inert waste	15% of metals, 100% of glass

Content information per m^2

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Glass	15,7	0	0
Aluminum	5,56	75%	0
Glass Fiber composite	4,42	0	0
Steel (low-alloyed)	0,85	0	0
Polysulfide	1,86	0	0
Rubber (EPDM)	0,48	0	0
Polyoxymethylene (POM)	0,32	0	0
Desiccant	0,14	0	0
Polyurethane coating	0,15	0	0

Polyester coating	0,11	0	0
EPS	0,63	0	0
Silicone	0,03	0	0
Polyamide (PA6)	0,02	0	0
Butyl acrylate	0,01	0	0
Total weight	**30,4**	**13,7%**	**0%**

Packaging materials	**Weight, kg**	**Weight-% (versus the product)**
Wood	0,58	1,9%
TOTAL	**0,58**	**1,9%**

Biogenic carbon in the product and accompanying packaging is <5% compared to its respective total weight.

Dangerous substances from the candidate list of SVHC for Authorization	**EC No.**	**CAS No.**	**Weight-% per functional or declared unit**
No SVHC substances included in the product			

Environmental Information

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.

Mandatory impact category indicators according to EN 15804

Results per functional unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	7,13E+01	1,76E+00	3,35E-01	0,00E+00	1,37E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,17E+00	4,52E+00	1,04E-01	-1,76E+01
GWP-biogenic	kg CO_2 eq.	5,54E-01	1,63E-03	4,37E-01	0,00E+00	5,25E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,08E-03	2,77E+00	6,32E-05	-8,13E-01
GWP-luluc	kg CO_2 eq.	2,92E-01	8,39E-04	2,60E-04	0,00E+00	1,69E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,59E-04	1,24E-04	6,12E-05	-1,04E-01
GWP-total	kg CO_2 eq.	7,05E+01	1,76E+00	7,73E-01	0,00E+00	1,39E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,18E+00	7,29E+00	1,04E-01	-1,85E+01
ODP	kg CFC 11 eq.	2,66E-06	3,73E-08	1,32E-09	0,00E+00	7,37E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,49E-08	2,40E-08	2,89E-09	-6,48E-07
AP	mol H^+ eq.	4,76E-01	5,59E-03	3,26E-04	0,00E+00	7,04E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,73E-03	3,11E-03	7,52E-04	-6,95E-02
EP-freshwater	kg P eq.	2,35E-02	1,20E-04	4,32E-05	0,00E+00	3,12E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,00E-05	4,09E-04	8,31E-06	-6,48E-03
EP-marine	kg N eq.	8,56E-02	1,92E-03	1,41E-04	0,00E+00	1,87E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,28E-03	1,47E-03	2,88E-04	-1,29E-02
EP-terrestrial	mol N eq.	8,35E-01	2,03E-02	1,13E-03	0,00E+00	1,75E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,35E-02	1,27E-02	3,09E-03	-1,27E-01
POCP	kg NMVOC eq.	3,44E-01	8,35E-03	3,22E-04	0,00E+00	1,93E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,57E-03	3,36E-03	1,08E-03	-4,28E-02
ADP-minerals&metals*	kg Sb eq.	1,23E-03	5,50E-06	2,49E-07	0,00E+00	9,50E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,67E-06	7,47E-07	1,38E-07	-8,11E-06
ADP-fossil*	MJ	1,10E+03	2,43E+01	6,42E-01	0,00E+00	4,24E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,62E+01	8,52E+00	2,49E+00	-3,24E+02
WDP*	m^3	2,54E+02	1,00E-01	5,31E-02	0,00E+00	1,10E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,70E-02	6,19E-01	1,10E-01	-4,72E+00
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 of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results per functional unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO2 eq.	6,84E+01	1,72E+00	3,38E-01	0,00E+00	1,31E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,15E+00	4,50E+00	1,00E-01	-1,73E+01
Particulate matter	disease inc.	4,84E-06	1,36E-07	4,71E-09	0,00E+00	9,12E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,10E-08	2,43E-08	1,65E-08	-5,99E-07
Ionising radiation**	kBq U-235 eq	1,34E+01	3,25E-02	8,60E-03	0,00E+00	1,27E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,17E-02	1,68E-01	1,57E-03	-7,43E+00
Ecotoxicity, freshwater*	CTUe	6,94E+02	1,28E+01	1,35E+00	0,00E+00	2,00E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,56E+00	1,70E+01	1,22E+00	-1,20E+01
Human toxicity, cancer*	CTUh	6,02E+01	4,22E-01	3,21E-02	0,00E+00	1,93E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,81E-01	4,77E-02	6,28E-02	-2,65E+00
Human toxicity, non-cancer*	CTUh	1,83E-06	2,25E-08	4,10E-09	0,00E+00	2,66E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,50E-08	4,59E-08	1,20E-09	-2,84E-07
Land use*	Pt	3,80E+02	1,45E+01	2,87E-01	0,00E+00	1,84E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,64E+00	2,53E+00	4,93E+00	-5,00E+01

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

*** Disclaimer: This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.*

[1] 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_2 is set to zero.

Resource use indicators

Results per functional unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1,53E+02	3,77E-01	7,54E-02	0,00E+00	2,25E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,51E-01	3,10E-01	2,10E-02	-3,40E+01
PERM	MJ	7,95E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,61E+02	3,77E-01	7,54E-02	0,00E+00	2,25E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,51E-01	3,10E-01	2,10E-02	-3,40E+01
PENRE	MJ	1,17E+03	2,58E+01	6,82E-01	0,00E+00	4,29E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,72E+01	9,00E+00	2,64E+00	-3,40E+02
PENRM	MJ	2,16E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,38E+03	2,58E+01	6,82E-01	0,00E+00	4,29E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,72E+01	9,00E+00	2,64E+00	-3,40E+02
SM	kg	4,17E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	3,44E-03	3,44E-03	1,06E-03	0,00E+00	2,56E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,29E-03	1,43E-02	2,62E-03	-7,67E-02
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															

Waste indicators

This chapter presents all the waste that is generated in the product system. Since ecoinvent is used as the main database, the waste management is contained within the system boundaries and no waste generation is reported[2]. This means that the waste is 0 for all modules and all products.

Results per functional unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste disposed	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

[2] A detailed description of this can be read at the bottom of this page: https://www.environdec.com/resources/indicators

Output flow indicators

Results per functional unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**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	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,73E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	5,64E-01	0,00E+00	5,74E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,09E+00	0,00E+00	0,00E+00
Exported energy, electricity	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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