

CITTERIO S.p.A.



ENVIRONMENTAL PRODUCT DECLARATION

Product Name:
3x3m Wood Wall / solid
3x3m Wood Wall / double glass
3x3m Wood Wall / single glass
3x3m Wood Wall / lateral single
glass

Manufacturing Plant:
Via Don Giuseppe Brambilla 16/18 I
23844, Sirone (LC), Italy

CITTERIO

In compliance with ISO 14025 e EN 15804:2012+A2/AC:2021

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|------------------|-----------|
| Program Operator | EPDIItaly |
| Publisher | EPDIItaly |

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| UNCPC Code | 3160 |

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| Issue Date | 18.07.2023 |
| Valid until | 18.07.2028 |

www.epditaly.it

GENERAL INFORMATION

| EPD REFERENCES | |
|---------------------------|--|
| EPD OWNER | Citterio S.p.A. Via Don Giuseppe Brambilla 16/18 I 23844, Sirone (LC), Italy. |
| REFERENCE PRODUCTION SITE | Via Don Giuseppe Brambilla 16/18 I 23844, Sirone (LC), Italy. |
| PROGRAM OPERATOR | EPDItaly Via Gaetano De Castillia 10, 20124 Milano (MI), Italia www.epditaly.it |
| INDEPENDENT VERIFICATION | This declaration was developed following the general instructions of the EPDItaly programme. Independent verification of the declaration and data carried out according to ISO 14025:2010. <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External Third party verification performed by: ICMQ SpA, via De Castillia, 10 - 20124 Milano (www.icmq.it). Accredited by Accredia. |
| SCOPE OF APPLICATION | The following is an EPD developed by LCA-Tool referring to 4 products of the Wood Wall family of dimensions 3x3m: Wood Wall Solid, Wood Wall Double Glass, Wood Wall Single Glass, Wood Wall Lateral Single Glass. |
| UNCPC CODE | 3160: Builders' joinery and carpentry of wood (including cellular wood panels, assembled parquet panels, shingles and shakes). |
| REFERENCE DOCUMENTS | This declaration was developed following the EPDItaly Programme Regulation rev. 5.2 published on 16/02/2022, available at www.epditaly.it . The EN 15804:2012+A2:2019 standard represent the framework reference for the core PCR " EPDItaly001-15 - Rev 3 Construction Products and Services. Issue date: 02/12/2019" |
| PCR | CORE-PCR EPDItaly001-15 - Rev 3 Construction Products and Services. Issue date: 02/12/2019 |
| COMPARABILITY | Environmental Declarations published within the same product category, but from different programmes, may not be comparable. In particular, EPDs of similar products may not be comparable if they do not comply with the reference technical standard. |
| RESPONSIBILITY | CITTERIO S.p.A. releases EPDItaly from any non-compliance with environmental legislation self-declared by the manufacturer. The holder of the declaration shall be responsible for the supporting information and evidence; EPDItaly declines all responsibility for the manufacturer's information, data and results of the life cycle assessment. |
| TOOL | - |
| ORGANIZATION CONTACT | Dott.ssa Laura Camerin – Citterio S.p.A. – Via Don Giuseppe Brambilla 16/18 I 23844, Sirone (LC), Italy. laura.camerin@citteriospa.com |
| TECHNICAL CONTACT | Federica Gilardelli, Chiara Albini, LCA studio managers, Greenwich S.r.l. Head office: Via Presolana 2/4, 24030, Medolago (BG) – Registered office: Via Vittorio Emanuele II, 179, 24033 Calusco d'Adda - Bergamo. info@greenwichsrl.it |



COMPANY INFORMATION

Citterio Spa was founded in 1958 in the province of Lecco and is a leader in the Italian and foreign markets for the production of high-quality office furniture. It is part of the Molteni Group, one of Italy's largest industrial furniture groups, together with Molteni & C, Dada and Unifor.

Citterio supplies the Italian and foreign markets with a wide range of office furniture solutions: wooden partitions, glass partitions, storage units, operative and executive furniture systems, mobile partitions. The Sirone plant in Italy houses Citterio's technical and commercial management offices, showroom and production units. Research, innovation and production flexibility have always been at the heart of the company's approach, so much so that in 2010 it presented the first C_SS acoustic box for meetings, which paved the way for a series of product collections designed to guarantee well-being and optimal acoustic performance in working environments.

Citterio has always animated the dialogue between partition walls and office furniture. The company combines and transforms traditional wood craftsmanship and industrial production processes. Each project stems from the ideas of Italian designers who translate needs and functions into innovative, high-performance products. Each product is the result of the expert hands of skilled workers who treat wood, glass and aluminium with unique expertise. Every single collection is selected by designers from all over the world to furnish workspaces inspired by the logic of high functionality, comfort, technological flexibility and aesthetic quality.

PRODUCT AND PRODUCTION PROCESS DESCRIPTION

Wood Wall

The subjects of the present EPD are 4 product codes that are part of the Wood Wall family. Wood Wall is an office partition wall where wood is the primary and distinguishing feature. Wood Wall is the synthesis of a new approach through which Citterio proposes a different way of setting up the working environment, it is the expression of a process of rediscovery of natural materials and their essence.

Wood Wall / solid

The partition made with wood panels with a composite structure that ensures perfect continuity with the glass modules, through a recessed junction.

Wood_Wall has been tested in the laboratory according to the following international standards UNI EN ISO 10140-1:2016 - UNI EN ISO 10140-2:2010 - UNI EN ISO 171-1:2013

The test results available is $R_w (C;Ctr) = 24 (-0;-1) \text{ dB}$

Wood Wall / double glass

The double glass partition with remarkable acoustic characteristics. A transparent barrier that allows the compartmentalization of the most private spaces.

Wood_Wall stratified double glass 5+5 has been tested in the laboratory according to the following international standards UNI EN ISO 10140-1:2016 - UNI EN ISO 10140-2:2010 - UNI EN ISO 171-1:2013

The test results available is $R_w (C;Ctr) = 38 (-1;-3) \text{ dB}$

Wood_Wall stratified double glass 5+52A Stadip Silence has been tested in the laboratory according to the following international standards UNI EN ISO 10140-1:2016 - UNI EN ISO 10140-2:2010 - UNI

EN ISO 171-1:2013

The test results available is $R_w (C;Ctr) = 40 (-1;-4)$ dB

There is also available specific test according UNI 10880:2000 for Impact Test.

For better acoustic performance, it is also possible to use 6+6 or 6+62A laminated glass with interposed acoustic film.

Wood Wall / single glass

Wood_Wall single glass is available with two different types of laminated glass:

Wood_Wall stratified single glass 5+5 has been tested in the laboratory according to the following international standards UNI EN ISO 10140-1:2016 - UNI EN ISO 10140-2:2010 - UNI EN ISO 171-1:2013

The test results available is $R_w (C;Ctr) = 34 (-1;-2)$ dB

Wood_Wall stratified single glass 5+52A Stadip Silence has been tested in the laboratory according to the following international standards UNI EN ISO 10140-1:2016 - UNI EN ISO 10140-2:2010 - UNI EN ISO 171-1:2013

The test results available is $R_w(C;Ctr) = 37 (-1;-3)$ dB

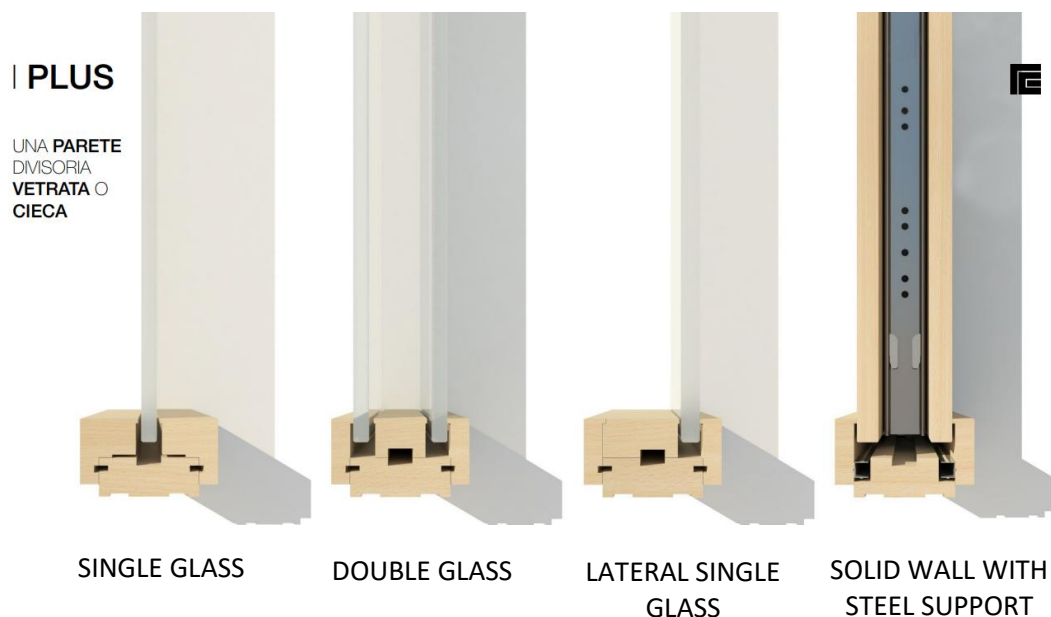
For better acoustic performance, it is also possible to use 6+6 or 6+62A laminated glass with interposed acoustic film.

Wood Wall / lateral single glass

The asymmetric wall which creates different depths effects of profiles to the variation of the observation side. The acoustic performance are similar to the central single glass.

For all four versions of the Wood_Wall wall, there are specific acoustic tests for the doors, in particular for standard doors, for acoustic doors without door closer and for acoustic door with door closer.

Test reports are available upon specific request to the company.



The bill of materials and the net weight of the components of the WW walls analysed are presented below.

| Component | WW / solid (kg) | WW / double glass (kg) | WW / single glass (kg) | WW /lateral single glass (kg) |
|-------------------------------|--------------------------------|-----------------------------------|-----------------------------------|--|
| Glass, laminated | - | 464,67 | 232,20 | 232,20 |
| Particleboard | 113,38 | - | - | - |
| EPDM | 36,19 | 0,14 | 0,14 | 0,14 |
| Galvanised steel, profiles | 32,43 | - | - | - |
| Hardwood | 13,80 | 23,52 | 26,88 | 26,93 |
| Polyester | 9,89 | - | - | - |
| Coating | 8,90 | 1,77 | 1,37 | 1,86 |
| Aluminium, profiles | 4,76 | - | - | - |
| Galvanised steel, hardware | 2,65 | 0,29 | 0,19 | 0,29 |
| Polycarbonate | - | 1,20 | 0,30 | - |
| Galvanised steel, screws | 1,70 | 0,49 | 0,59 | 0,66 |
| Aluminium, hardware | 0,74 | 0,89 | 0,43 | 0,77 |
| Steel, hardware | 0,67 | 0,08 | 0,22 | 0,02 |
| Polyurethane foam | - | 0,19 | 0,19 | 0,10 |
| ABS | - | 0,05 | - | 0,02 |
| Total | 191,23 | 493,29 | 262,52 | 263,30 |

SCOPE AND TYPE OF EPD

This is a product-specific declaration of type “cradle-to-gate with modules C1-C4 and module D, as set out in EN 15804:2012+A2:2019. Thus, the following phases were considered:

- A1-A3 Product stage: raw material extraction and processing, transport to the manufacturer and manufacturing of the finished product;
- C1-C4 End-of-life Stage (dismantling; collection & transport; end-of-life treatments).

| Production | | | Construction | | Use | | | | | | | End of life | | | | Benefits and loads beyond the system boundaries |
|---------------------|-----------|---------------|--------------|---------------------------|-----|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|---|
| 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 |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| X | X | X | MND | MND | MND | MND | MND | MND | MND | MND | MND | X | X | X | X | X |

Table 1: X = included in the LCA, MND = the module is not included in the LCA and is not declared

LCA INFORMATION

| | |
|---------------------------|---|
| Type of EPD | The EPD in question is cradle-to-gate with modules C1-C4 and module D. |
| Geographical scope | Performance was calculated with reference to the Citterio S.p.A. plant in Sirone. The reference market is Global. |
| Temporal validity | The reference period is the calendar year 2021. |
| Database used | Ecoinvent 3.8 |
| Software: | SimaPro 9.4.0.2 |
| Declared Unit | 1 office partition wall is analysed as declared unit. |
| Allocation rules | Mass-based allocation considering purchases of processed raw materials in 2021. |
| Cut-off rules | No cut-off considered. |
| Proxy data | No proxy data. |

Production Process

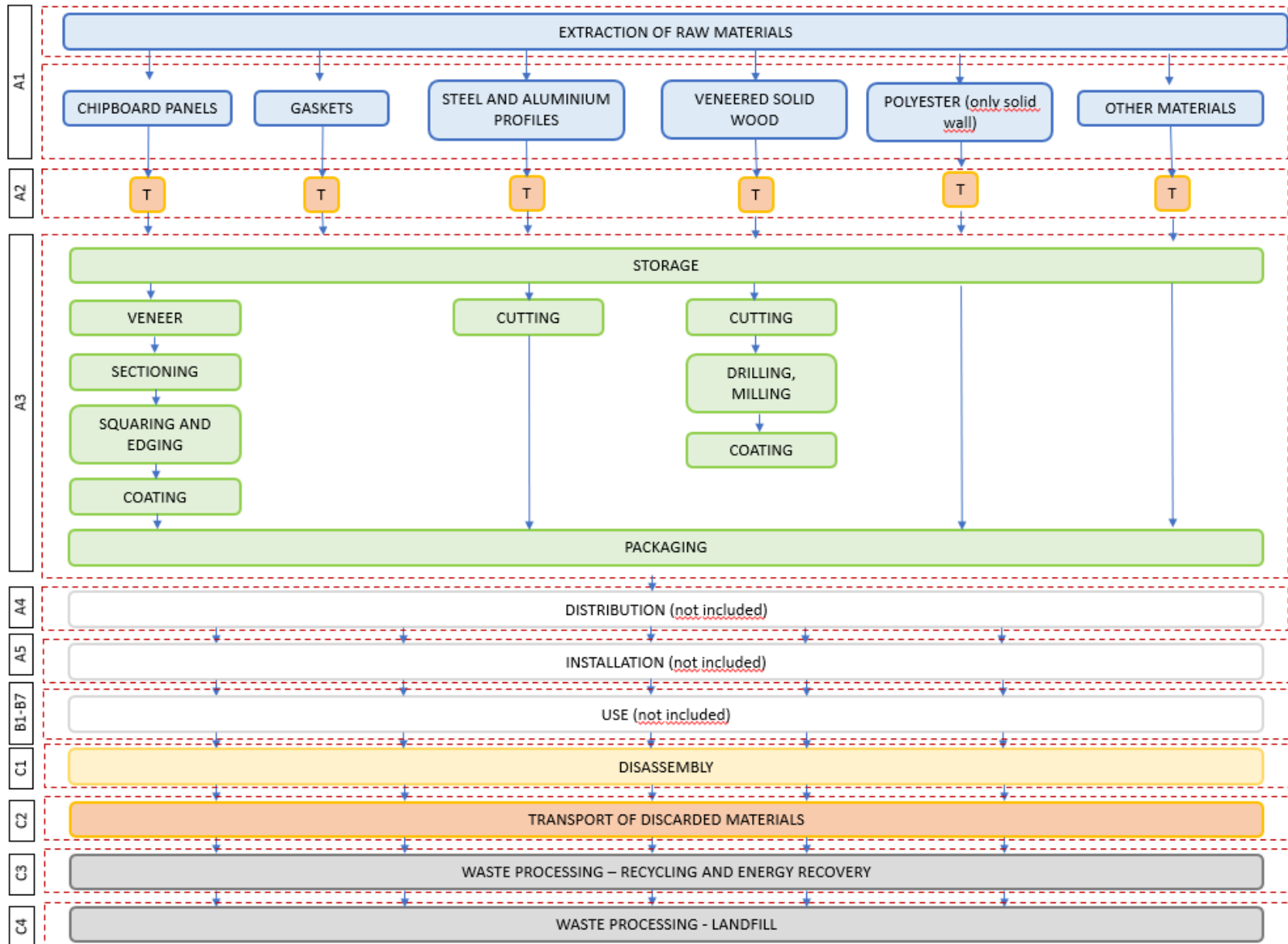
The design and production processes take place at Citterio's Sirone plant.

The process begins with the receipt of raw materials and semi-finished products, which are stored in the warehouse. The materials are then recovered along the path of production and assembly of the wall components.

The production processes include, for:

- **CHIPBOARD PANELS**, an initial visual quality control is carried out, followed by a cutting process to obtain the desired dimensions. This is followed by the veneering process with melamine resin edging with oak veneer. The waste generated by the cutting process is partly destined to be burnt in a kiln with energy recovery and partly disposed of externally with EWC code 030105;
- **SOLID WOOD**: the wood profiles are cut to the desired dimensions and undergo drilling and milling;
- **ALUMINIUM AND STEEL PROFILES**: cut to the desired dimensions;
- **WOODEN PANELS AND PROFILES**: coating;
- Packaging of product components to be assembled on site.

The system diagram of the solid wall, which is the product with the most machining, is presented below. For the other walls analysed, there is no machining of chipboard and cutting of metal profiles.



RESULTS

The following tables summarise the total impacts for each indicator of the 4 products under study.

Wood Wall / solid

Environmental impact indicators

| Environmental impact parameters - Results per declared unit | | | | | | | | | | |
|---|---|-----------|----------|----------|-----------|----------|----------|----------|----------|-----------|
| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
| GWP-fossil | kg CO ₂ eq. | 8,74E+02 | 6,09E+00 | 6,45E+01 | 9,44E+02 | 1,50E+01 | 3,18E+01 | 5,25E+01 | 7,75E+00 | -1,44E+02 |
| GWP-biogenic | kg CO ₂ eq. | -3,27E+02 | 5,23E-03 | 1,01E+02 | -2,26E+02 | 2,63E-03 | 1,71E-02 | 2,28E+02 | 6,88E+01 | 5,38E+00 |
| GWP-luluc | kg CO ₂ eq. | 1,89E+00 | 2,41E-03 | 1,99E-02 | 1,92E+00 | 4,90E-04 | 1,32E-02 | 5,51E-03 | 1,24E-03 | -8,14E-02 |
| GWP-total | kg CO ₂ eq. | 5,50E+02 | 6,10E+00 | 1,65E+02 | 7,21E+02 | 1,50E+01 | 3,19E+01 | 2,81E+02 | 7,66E+01 | -1,39E+02 |
| ODP | kg CFC 11 eq. | 3,38E-04 | 1,42E-06 | 7,59E-07 | 3,40E-04 | 1,72E-07 | 6,92E-06 | 3,61E-07 | 3,37E-07 | -2,61E-05 |
| AP | mol H ⁺ eq. | 6,70E+00 | 3,08E-02 | 3,59E-01 | 7,09E+00 | 7,54E-03 | 1,62E-01 | 3,49E-02 | 9,94E-03 | -9,31E-01 |
| EP-freshwater | kg P eq. | 2,97E-01 | 3,96E-04 | 7,00E-03 | 3,05E-01 | 1,28E-04 | 2,39E-03 | 1,24E-03 | 2,14E-04 | -6,45E-02 |
| EP-marine | kg N eq. | 9,52E-01 | 1,06E-02 | 1,76E-01 | 1,14E+00 | 8,61E-03 | 5,47E-02 | 1,64E-02 | 1,47E-01 | -1,22E-01 |
| EP-terrestrial | mol N eq. | 1,92E+01 | 1,16E-01 | 1,93E+00 | 2,12E+01 | 3,26E-02 | 5,98E-01 | 1,62E-01 | 3,60E-02 | -1,41E+00 |
| POCP | kg NMVOC eq. | 3,51E+00 | 3,31E-02 | 4,62E-01 | 4,00E+00 | 8,65E-03 | 1,70E-01 | 4,04E-02 | 1,28E-02 | -3,84E-01 |
| ADP-minerals&metals* | kg Sb eq. | 1,41E-02 | 2,14E-05 | 2,24E-05 | 1,42E-02 | 2,02E-06 | 1,09E-04 | 1,10E-05 | 3,81E-06 | -1,21E-04 |
| ADP-fossil* | MJ | 1,86E+04 | 9,28E+01 | 9,04E+01 | 1,88E+04 | 1,33E+01 | 4,73E+02 | 3,68E+01 | 2,67E+01 | -1,79E+03 |
| WDP* | m ³ | 5,10E+02 | 2,78E-01 | 8,13E-01 | 5,11E+02 | 7,23E-01 | 1,63E+00 | 8,51E-01 | 1,13E+00 | -6,26E+00 |
| Acronyms | <p>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</p> <p>* The results of this indicator should be used with caution given their high uncertainty or limited experience with the indicator</p> | | | | | | | | | |

| Use of resources - Results per declared unit | | | | | | | | | | |
|--|------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
| PERE | MJ | 8,97E+02 | 1,31E+00 | 2,90E+00 | 9,01E+02 | 3,87E-01 | 5,45E+00 | 1,40E+00 | 5,45E-01 | -1,32E+02 |
| PERM | MJ | 3,24E+03 | 0,00E+00 | 1,70E+01 | 3,26E+03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 4,14E+03 | 1,31E+00 | 1,99E+01 | 4,16E+03 | 3,87E-01 | 5,45E+00 | 1,40E+00 | 5,45E-01 | -1,32E+02 |
| PENRE | MJ | 1,41E+04 | 9,28E+01 | 7,67E+01 | 1,43E+04 | 1,33E+01 | 4,73E+02 | 3,68E+01 | 2,67E+01 | -1,79E+03 |
| PENRM | MJ | 4,45E+03 | 0,00E+00 | 1,38E+01 | 4,46E+03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 1,86E+04 | 9,28E+01 | 9,05E+01 | 1,88E+04 | 1,33E+01 | 4,73E+02 | 3,68E+01 | 2,67E+01 | -1,79E+03 |
| SM | kg | 1,55E+02 | 0,00E+00 | 0,00E+00 | 1,55E+02 | 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 |
| 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 |
| FW | m ³ | 1,50E+01 | 1,04E-02 | 2,95E-02 | 1,50E+01 | 2,28E-02 | 5,41E-02 | 4,00E-02 | 2,77E-02 | -2,32E-01 |
| 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 production - Results per declared unit | | | | | | | | | | |
|--|---|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
| HWD | kg | 1,46E-01 | 2,42E-04 | 1,41E-04 | 1,47E-01 | 3,30E-05 | 1,25E-03 | 1,05E-04 | 4,05E-05 | 3,23E-02 |
| NHWD | kg | 1,03E+02 | 4,78E+00 | 5,31E+00 | 1,13E+02 | 2,76E+00 | 2,40E+01 | 3,26E+00 | 1,06E+02 | -2,13E+01 |
| RWD | kg | 5,50E-02 | 6,28E-04 | 3,77E-04 | 5,60E-02 | 7,23E-05 | 3,09E-03 | 1,22E-04 | 1,57E-04 | -3,49E-03 |
| Acronyms | HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed | | | | | | | | | |

| Output flows - Results per declared unit | | | | | | | | | | |
|--|---|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
| CRU | 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 |
| MFR | kg | 0,00E+00 | 0,00E+00 | 3,57E+01 | 3,57E+01 | 0,00E+00 | 0,00E+00 | 5,54E+01 | 0,00E+00 | 0,00E+00 |
| MER | kg | 0,00E+00 | 0,00E+00 | 1,15E-01 | 1,15E-01 | 0,00E+00 | 0,00E+00 | 1,50E+02 | 0,00E+00 | 0,00E+00 |
| EEE | 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 |
| EET | 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 |
| Acronyms | CRU = Components for re-use; MR = Material for recycling; MER = Materials for energy recovery; EEE = Exported energy, electricity; EET = Exported energy, thermal | | | | | | | | | |

| Additional indicators - Results per declared unit | | | | | | | | | | |
|---|---|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
| PM | Disease Inc. | 7,03E-05 | 5,43E-07 | 3,12E-06 | 7,40E-05 | 8,29E-08 | 2,79E-06 | 3,56E-07 | 1,91E-07 | -4,61E-06 |
| IRP** | kBq U235 eq. | 1,16E+02 | 4,77E-01 | 5,43E-01 | 1,17E+02 | 6,80E-02 | 2,17E+00 | 1,55E-01 | 1,29E-01 | -1,11E+01 |
| ETP-fw* | CTUe | 1,85E+04 | 7,24E+01 | 6,72E+04 | 8,57E+04 | 3,79E+01 | 4,06E+02 | 1,31E+02 | 7,32E+02 | -1,50E+03 |
| HTP-nc* | CTUh | 1,47E-05 | 7,59E-08 | 1,58E-05 | 3,05E-05 | 5,33E-08 | 3,94E-07 | 3,42E-07 | 2,50E-08 | 5,07E-07 |
| HTP-c* | CTUh | 2,16E-06 | 2,35E-09 | 2,06E-07 | 2,37E-06 | 2,00E-09 | 1,21E-08 | 7,54E-09 | 8,88E-10 | 3,34E-07 |
| SQP* | Pt | 8,56E+03 | 6,38E+01 | 7,86E+01 | 8,70E+03 | 3,68E+00 | 3,21E+02 | 1,77E+01 | 6,16E+01 | -3,66E+02 |
| Acronyms | <p>CRU = Components for re-use; MR = Material for recycling; MER = Materials for energy recovery; EEE = Exported energy, electricity; EET = Exported energy, thermal</p> <p>* The results of this indicator should be used with caution given their high uncertainty or limited experience with the indicator Disclaimer</p> <p>** This impact category deals primarily with the possible impact on human health of low-dose ionizing radiation from the nuclear fuel cycle. Do not consider effects due to possible nuclear accidents, occupational exposure or due to the disposal of radioactive waste in underground landfills. Potential ionizing radiation from the ground, radon and some building materials are also not evaluated from this indicator.</p> | | | | | | | | | |

Wood Wall / double glass

Environmental impact indicators

| Environmental impact parameters - Results per declared unit | | | | | | | | | | |
|---|---|---------------|----------|----------|---------------|----------|----------|-----------|----------|---------------|
| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
| GWP-fossil | kg CO ₂ eq. | 8,09E+02 | 5,40E+00 | 8,33E+00 | 8,23E+02 | 1,50E+01 | 8,45E+01 | 1,35E+00 | 4,08E+00 | - 2,14E+01 |
| GWP-biogenic | kg CO ₂ eq. | - 3,00E+01 | 4,64E-03 | 4,41E-01 | - 2,95E+01 | 2,63E-03 | 4,55E-02 | 2,62E+01 | 6,45E+00 | 3,69E+00 |
| GWP-luluc | kg CO ₂ eq. | 1,14E+00 | 2,14E-03 | 1,07E-02 | 1,16E+00 | 4,90E-04 | 3,51E-02 | 1,34E-03 | 3,69E-03 | 6,65E-03 |
| GWP-total | kg CO ₂ eq. | 7,81E+02 | 5,41E+00 | 8,78E+00 | 7,95E+02 | 1,50E+01 | 8,46E+01 | 2,76E+01 | 1,05E+01 | - 1,77E+01 |
| ODP | kg CFC 11 eq. | 1,14E-04 | 1,26E-06 | 5,99E-07 | 1,16E-04 | 1,72E-07 | 1,84E-05 | 6,99E-08 | 1,34E-06 | -9,12E-07 |
| AP | mol H ⁺ eq. | 6,90E+00 | 2,74E-02 | 4,33E-02 | 6,97E+00 | 7,54E-03 | 4,29E-01 | 5,06E-03 | 3,56E-02 | -1,53E-01 |
| EP-freshwater | kg P eq. | 2,28E-01 | 3,51E-04 | 1,64E-03 | 2,30E-01 | 1,28E-04 | 6,36E-03 | 2,15E-04 | 4,09E-04 | -9,98E-03 |
| EP-marine | kg N eq. | 1,17E+00 | 9,42E-03 | 1,69E-02 | 1,20E+00 | 8,61E-03 | 1,45E-01 | 2,14E-03 | 1,65E-02 | -2,12E-02 |
| EP-terrestrial | mol N eq. | 1,39E+01 | 1,03E-01 | 1,81E-01 | 1,42E+01 | 3,26E-02 | 1,59E+00 | 2,12E-02 | 1,37E-01 | -2,18E-01 |
| POCP | kg NMVOC eq. | 3,42E+00 | 2,94E-02 | 4,77E-02 | 3,50E+00 | 8,65E-03 | 4,52E-01 | 5,48E-03 | 3,96E-02 | -6,29E-02 |
| ADP-minerals&metals* | kg Sb eq. | 8,59E-03 | 1,89E-05 | 2,21E-05 | 8,63E-03 | 2,02E-06 | 2,91E-04 | 2,01E-06 | 1,29E-05 | 9,46E-05 |
| ADP-fossil* | MJ | 1,09E+04 | 8,23E+01 | 7,01E+01 | 1,10E+04 | 1,33E+01 | 1,26E+03 | 7,80E+00 | 9,84E+01 | - 2,48E+02 |
| WDP* | m ³ | 2,85E+02 | 2,47E-01 | 9,55E-01 | 2,87E+02 | 7,23E-01 | 4,34E+00 | -4,65E-02 | 4,47E+00 | - 1,81E+00 |
| Acronyms | <p>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</p> <p>* The results of this indicator should be used with caution given their high uncertainty or limited experience with the indicator</p> | | | | | | | | | |

| Use of resources - Results per declared unit | | | | | | | | | | |
|--|---|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
| PERE | MJ | 1,24E+03 | 1,16E+00 | 3,96E+00 | 1,25E+03 | 3,87E-01 | 1,45E+01 | 3,77E-01 | 1,15E+00 | -2,48E+01 |
| PERM | MJ | 3,69E+02 | 0,00E+00 | 0,00E+00 | 3,69E+02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 1,61E+03 | 1,16E+00 | 3,96E+00 | 1,62E+03 | 3,87E-01 | 1,45E+01 | 3,77E-01 | 1,15E+00 | -2,48E+01 |
| PENRE | MJ | 1,07E+04 | 8,23E+01 | 6,56E+01 | 1,09E+04 | 1,33E+01 | 1,26E+03 | 7,80E+00 | 9,84E+01 | -2,48E+02 |
| PENRM | MJ | 1,42E+02 | 0,00E+00 | 4,60E+00 | 1,47E+02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 1,09E+04 | 8,23E+01 | 7,02E+01 | 1,10E+04 | 1,33E+01 | 1,26E+03 | 7,80E+00 | 9,84E+01 | -2,48E+02 |
| SM | 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 |
| 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 |
| 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 |
| FW | m ³ | 8,22E+00 | 9,18E-03 | 3,18E-02 | 8,26E+00 | 2,28E-02 | 1,44E-01 | 6,42E-04 | 1,07E-01 | -5,68E-02 |
| Acronyms | <p>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</p> | | | | | | | | | |

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 production - Results per declared unit

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|-----------|---|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| HWD | kg | 2,07E-02 | 2,15E-04 | 1,35E-04 | 2,11E-02 | 3,30E-05 | 3,32E-03 | 1,39E-05 | 1,58E-04 | 6,21E-03 |
| NHWD | kg | 1,23E+02 | 4,24E+00 | 5,65E+00 | 1,33E+02 | 2,76E+00 | 6,38E+01 | 6,23E+00 | 4,25E+02 | -2,35E+00 |
| RWD | kg | 4,03E-02 | 5,57E-04 | 2,84E-04 | 4,11E-02 | 7,23E-05 | 8,21E-03 | 3,15E-05 | 6,07E-04 | -4,86E-04 |
| Acronyms | HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed | | | | | | | | | |

Output flows - Results per declared unit

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|-----------|---|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| CRU | 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 |
| MFR | kg | 0,00E+00 | 0,00E+00 | 3,40E+00 | 3,40E+00 | 0,00E+00 | 0,00E+00 | 5,03E+01 | 0,00E+00 | 0,00E+00 |
| MER | kg | 0,00E+00 | 0,00E+00 | 1,64E-02 | 1,64E-02 | 0,00E+00 | 0,00E+00 | 1,62E+01 | 0,00E+00 | 0,00E+00 |
| EEE | 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 |
| EET | 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 |
| Acronyms | CRU = Components for re-use; MR = Material for recycling; MER = Materials for energy recovery; EEE = Exported energy, electricity; EET = Exported energy, thermal | | | | | | | | | |

Additional indicators - Results per declared unit

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|-----------|---|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PM | Disease Inc. | 7,46E-05 | 4,81E-07 | 1,91E-06 | 7,70E-05 | 8,29E-08 | 7,42E-06 | 6,42E-08 | 7,46E-07 | -8,95E-07 |
| IRP** | kBq U235 eq. | 8,95E+01 | 4,23E-01 | 5,26E-01 | 9,04E+01 | 6,80E-02 | 5,76E+00 | 4,07E-02 | 4,27E-01 | -1,54E+00 |
| ETP-fw* | CTUe | 5,15E+04 | 6,43E+01 | 4,61E+03 | 5,62E+04 | 3,79E+01 | 1,08E+03 | 1,16E+01 | 2,03E+02 | -2,81E+02 |
| HTP-nc* | CTUh | 1,19E-05 | 6,74E-08 | 1,14E-06 | 1,32E-05 | 5,33E-08 | 1,05E-06 | 3,99E-08 | 4,01E-08 | -2,11E-07 |
| HTP-c* | CTUh | 6,84E-07 | 2,08E-09 | 1,87E-08 | 7,05E-07 | 2,00E-09 | 3,20E-08 | 9,65E-10 | 2,87E-09 | -3,97E-09 |
| SQP* | Pt | 7,60E+03 | 5,66E+01 | 3,05E+01 | 7,69E+03 | 3,68E+00 | 8,51E+02 | 6,99E+00 | 2,50E+02 | -6,70E+01 |
| Acronyms | <p>CRU = Components for re-use; MR = Material for recycling; MER = Materials for energy recovery; EEE = Exported energy, electricity; EET = Exported energy, thermal</p> <p>* The results of this indicator should be used with caution given their high uncertainty or limited experience with the indicator Disclaimer</p> <p>** This impact category deals primarily with the possible impact on human health of low-dose ionizing radiation from the nuclear fuel cycle. Do not consider effects due to possible nuclear accidents, occupational exposure or due to the disposal of radioactive waste in underground landfills. Potential ionizing radiation from the ground, radon and some building materials are also not evaluated from this indicator.</p> | | | | | | | | | |

Wood Wall / single glass

Environmental impact indicators

| Environmental impact parameters - Results per declared unit | | | | | | | | | | |
|---|---|-----------|----------|----------|-----------|----------|----------|-----------|----------|-----------|
| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
| GWP-fossil | kg CO ₂ eq. | 4,20E+02 | 2,74E+00 | 6,07E+00 | 4,28E+02 | 1,50E+01 | 4,49E+01 | 8,31E-01 | 2,06E+00 | -1,52E+01 |
| GWP-biogenic | kg CO ₂ eq. | -3,83E+01 | 2,35E-03 | 3,83E-01 | -3,79E+01 | 2,63E-03 | 2,42E-02 | 3,01E+01 | 8,15E+00 | 4,24E+00 |
| GWP-luluc | kg CO ₂ eq. | 6,13E-01 | 1,08E-03 | 1,15E-03 | 6,15E-01 | 4,90E-04 | 1,87E-02 | 1,05E-03 | 1,88E-03 | -2,90E-03 |
| GWP-total | kg CO ₂ eq. | 3,82E+02 | 2,74E+00 | 6,45E+00 | 3,91E+02 | 1,50E+01 | 4,50E+01 | 3,09E+01 | 1,02E+01 | -1,09E+01 |
| ODP | kg CFC 11 eq. | 5,95E-05 | 6,39E-07 | 1,78E-07 | 6,03E-05 | 1,72E-07 | 9,76E-06 | 5,48E-08 | 6,78E-07 | -8,26E-07 |
| AP | mol H ⁺ eq. | 3,49E+00 | 1,39E-02 | 3,17E-02 | 3,54E+00 | 7,54E-03 | 2,28E-01 | 4,53E-03 | 1,80E-02 | -9,20E-02 |
| EP-freshwater | kg P eq. | 1,19E-01 | 1,78E-04 | 9,18E-04 | 1,20E-01 | 1,28E-04 | 3,38E-03 | 1,90E-04 | 2,11E-04 | -6,44E-03 |
| EP-marine | kg N eq. | 6,06E-01 | 4,78E-03 | 1,44E-02 | 6,25E-01 | 8,61E-03 | 7,72E-02 | 2,04E-03 | 9,09E-03 | -1,37E-02 |
| EP-terrestrial | mol N eq. | 7,03E+00 | 5,22E-02 | 1,56E-01 | 7,24E+00 | 3,26E-02 | 8,44E-01 | 2,01E-02 | 6,95E-02 | -1,44E-01 |
| POCP | kg NMVOC eq. | 1,79E+00 | 1,49E-02 | 3,88E-02 | 1,84E+00 | 8,65E-03 | 2,40E-01 | 5,12E-03 | 2,01E-02 | -4,07E-02 |
| ADP-minerals&metals* | kg Sb eq. | 4,26E-03 | 9,61E-06 | 9,20E-06 | 4,28E-03 | 2,02E-06 | 1,54E-04 | 1,58E-06 | 6,54E-06 | 2,66E-05 |
| ADP-fossil* | MJ | 5,77E+03 | 4,18E+01 | 2,69E+01 | 5,83E+03 | 1,33E+01 | 6,67E+02 | 6,12E+00 | 4,98E+01 | -1,90E+02 |
| WDP* | m ³ | 1,54E+02 | 1,25E-01 | 5,20E-01 | 1,55E+02 | 7,23E-01 | 2,30E+00 | -1,33E-01 | 2,26E+00 | -1,49E+00 |
| Acronyms | <p>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</p> <p>* The results of this indicator should be used with caution given their high uncertainty or limited experience with the indicator</p> | | | | | | | | | |

| Use of resources - Results per declared unit | | | | | | | | | | |
|--|---|----------|----------|----------|----------|----------|----------|-----------|----------|-----------|
| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
| PERE | MJ | 8,86E+02 | 5,89E-01 | 1,52E+00 | 8,88E+02 | 3,87E-01 | 7,69E+00 | 2,68E-01 | 5,87E-01 | -2,82E+01 |
| PERM | MJ | 4,28E+02 | 0,00E+00 | 0,00E+00 | 4,28E+02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 1,31E+03 | 5,89E-01 | 1,52E+00 | 1,32E+03 | 3,87E-01 | 7,69E+00 | 2,68E-01 | 5,87E-01 | -2,82E+01 |
| PENRE | MJ | 5,66E+03 | 4,18E+01 | 2,23E+01 | 5,72E+03 | 1,33E+01 | 6,67E+02 | 6,13E+00 | 4,99E+01 | -1,90E+02 |
| PENRM | MJ | 1,09E+02 | 0,00E+00 | 4,60E+00 | 1,13E+02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 5,77E+03 | 4,18E+01 | 2,69E+01 | 5,84E+03 | 1,33E+01 | 6,67E+02 | 6,13E+00 | 4,99E+01 | -1,90E+02 |
| SM | 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 |
| 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 |
| 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 |
| FW | m ³ | 4,41E+00 | 4,66E-03 | 1,54E-02 | 4,43E+00 | 2,28E-02 | 7,64E-02 | -1,65E-03 | 5,42E-02 | -5,10E-02 |
| Acronyms | <p>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</p> | | | | | | | | | |

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 production - Results per declared unit

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|-----------|---|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| HWD | kg | 1,01E-02 | 1,09E-04 | 4,33E-05 | 1,02E-02 | 3,30E-05 | 1,76E-03 | 1,18E-05 | 8,01E-05 | 2,96E-03 |
| NHWD | kg | 6,33E+01 | 2,15E+00 | 2,38E+00 | 6,78E+01 | 2,76E+00 | 3,39E+01 | 3,27E+00 | 2,15E+02 | -1,53E+00 |
| RWD | kg | 2,09E-02 | 2,82E-04 | 7,60E-05 | 2,13E-02 | 7,23E-05 | 4,36E-03 | 2,33E-05 | 3,07E-04 | -3,83E-04 |
| Acronyms | HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed | | | | | | | | | |

Output flows - Results per declared unit

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|-----------|---|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| CRU | 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 |
| MFR | kg | 0,00E+00 | 0,00E+00 | 3,88E+00 | 3,88E+00 | 0,00E+00 | 0,00E+00 | 2,70E+01 | 0,00E+00 | 0,00E+00 |
| MER | kg | 0,00E+00 | 0,00E+00 | 1,87E-02 | 1,87E-02 | 0,00E+00 | 0,00E+00 | 1,81E+01 | 0,00E+00 | 0,00E+00 |
| EEE | 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 |
| EET | 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 |
| Acronyms | CRU = Components for re-use; MR = Material for recycling; MER = Materials for energy recovery; EEE = Exported energy, electricity; EET = Exported energy, thermal | | | | | | | | | |

Additional indicators - Results per declared unit

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|-----------|---|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PM | Disease Inc. | 3,81E-05 | 2,44E-07 | 1,96E-06 | 4,03E-05 | 8,29E-08 | 3,94E-06 | 5,55E-08 | 3,78E-07 | -5,47E-07 |
| IRP** | kBq U235 eq. | 4,69E+01 | 2,15E-01 | 1,86E-01 | 4,73E+01 | 6,80E-02 | 3,06E+00 | 3,00E-02 | 2,17E-01 | -1,24E+00 |
| ETP-fw* | CTUe | 2,60E+04 | 3,26E+01 | 5,29E+03 | 3,13E+04 | 3,79E+01 | 5,73E+02 | 9,00E+00 | 1,00E+02 | -1,90E+02 |
| HTP-nc* | CTUh | 6,11E-06 | 3,42E-08 | 1,26E-06 | 7,41E-06 | 5,33E-08 | 5,56E-07 | 4,14E-08 | 2,07E-08 | -8,90E-08 |
| HTP-c* | CTUh | 3,84E-07 | 1,06E-09 | 1,77E-08 | 4,02E-07 | 2,00E-09 | 1,70E-08 | 9,55E-10 | 1,46E-09 | 4,28E-09 |
| SQP* | Pt | 6,27E+03 | 2,87E+01 | 6,78E+00 | 6,31E+03 | 3,68E+00 | 4,52E+02 | 4,58E+00 | 1,26E+02 | -1,06E+02 |
| Acronyms | <p>CRU = Components for re-use; MR = Material for recycling; MER = Materials for energy recovery; EEE = Exported energy, electricity; EET = Exported energy, thermal</p> <p>* The results of this indicator should be used with caution given their high uncertainty or limited experience with the indicator Disclaimer</p> <p>** This impact category deals primarily with the possible impact on human health of low-dose ionizing radiation from the nuclear fuel cycle. Do not consider effects due to possible nuclear accidents, occupational exposure or due to the disposal of radioactive waste in underground landfills. Potential ionizing radiation from the ground, radon and some building materials are also not evaluated from this indicator.</p> | | | | | | | | | |

Wood Wall / lateral single glass

Environmental impact indicators

| Environmental impact parameters - Results per declared unit | | | | | | | | | | |
|---|---|---------------|----------|----------|---------------|----------|----------|-----------|----------|---------------|
| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
| GWP-fossil | kg CO ₂ eq. | 4,26E+02 | 2,74E+00 | 6,08E+00 | 4,35E+02 | 1,50E+01 | 4,50E+01 | 8,07E-01 | 2,05E+00 | - 2,04E+01 |
| GWP-biogenic | kg CO ₂ eq. | - 3,83E+01 | 2,36E-03 | 3,84E-01 | - 3,79E+01 | 2,63E-03 | 2,42E-02 | 3,06E+01 | 8,16E+00 | 4,27E+00 |
| GWP-luluc | kg CO ₂ eq. | 6,78E-01 | 1,09E-03 | 1,15E-03 | 6,80E-01 | 4,90E-04 | 1,87E-02 | 1,06E-03 | 1,88E-03 | -3,56E-03 |
| GWP-total | kg CO ₂ eq. | 3,89E+02 | 2,75E+00 | 6,46E+00 | 3,98E+02 | 1,50E+01 | 4,50E+01 | 3,14E+01 | 1,02E+01 | - 1,62E+01 |
| ODP | kg CFC 11 eq. | 6,01E-05 | 6,40E-07 | 1,78E-07 | 6,09E-05 | 1,72E-07 | 9,77E-06 | 5,55E-08 | 6,78E-07 | -9,72E-07 |
| AP | mol H ⁺ eq. | 3,74E+00 | 1,39E-02 | 3,17E-02 | 3,79E+00 | 7,54E-03 | 2,28E-01 | 4,60E-03 | 1,81E-02 | -1,41E-01 |
| EP-freshwater | kg P eq. | 1,22E-01 | 1,78E-04 | 9,18E-04 | 1,24E-01 | 1,28E-04 | 3,38E-03 | 1,93E-04 | 2,12E-04 | -9,38E-03 |
| EP-marine | kg N eq. | 6,20E-01 | 4,78E-03 | 1,44E-02 | 6,39E-01 | 8,61E-03 | 7,73E-02 | 2,07E-03 | 9,03E-03 | -2,02E-02 |
| EP-terrestrial | mol N eq. | 8,03E+00 | 5,23E-02 | 1,56E-01 | 8,24E+00 | 3,26E-02 | 8,45E-01 | 2,04E-02 | 6,96E-02 | -2,09E-01 |
| POCP | kg NMVOC eq. | 1,81E+00 | 1,49E-02 | 3,89E-02 | 1,87E+00 | 8,65E-03 | 2,40E-01 | 5,20E-03 | 2,01E-02 | -5,99E-02 |
| ADP-minerals&metals* | kg Sb eq. | 4,95E-03 | 9,62E-06 | 9,20E-06 | 4,97E-03 | 2,02E-06 | 1,55E-04 | 1,60E-06 | 6,55E-06 | 7,38E-05 |
| ADP-fossil* | MJ | 5,87E+03 | 4,18E+01 | 2,69E+01 | 5,94E+03 | 1,33E+01 | 6,68E+02 | 6,20E+00 | 4,99E+01 | - 2,42E+02 |
| WDP* | m ³ | 1,57E+02 | 1,25E-01 | 5,20E-01 | 1,58E+02 | 7,23E-01 | 2,31E+00 | -1,39E-01 | 2,27E+00 | - 1,73E+00 |
| Acronyms | <p>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</p> <p>* The results of this indicator should be used with caution given their high uncertainty or limited experience with the indicator</p> | | | | | | | | | |

| Use of resources - Results per declared unit | | | | | | | | | | |
|--|--|----------|----------|----------|----------|----------|----------|-----------|----------|-----------|
| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
| PERE | MJ | 9,05E+02 | 5,90E-01 | 1,52E+00 | 9,07E+02 | 3,87E-01 | 7,69E+00 | 2,71E-01 | 5,91E-01 | -2,88E+01 |
| PERM | MJ | 4,29E+02 | 0,00E+00 | 0,00E+00 | 4,29E+02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ | 1,33E+03 | 5,90E-01 | 1,52E+00 | 1,34E+03 | 3,87E-01 | 7,69E+00 | 2,71E-01 | 5,91E-01 | -2,88E+01 |
| PENRE | MJ | 5,76E+03 | 4,18E+01 | 2,23E+01 | 5,83E+03 | 1,33E+01 | 6,68E+02 | 6,21E+00 | 4,99E+01 | -2,42E+02 |
| PENRM | MJ | 1,06E+02 | 0,00E+00 | 4,60E+00 | 1,10E+02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ | 5,87E+03 | 4,18E+01 | 2,69E+01 | 5,94E+03 | 1,33E+01 | 6,68E+02 | 6,21E+00 | 4,99E+01 | -2,42E+02 |
| SM | 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 |
| 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 |
| 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 |
| FW | m ³ | 4,56E+00 | 4,66E-03 | 1,54E-02 | 4,58E+00 | 2,28E-02 | 7,65E-02 | -1,76E-03 | 5,43E-02 | -5,94E-02 |
| Acronyms | <p>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</p> | | | | | | | | | |

secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels;
FW = Use of net fresh water

Waste production - Results per declared unit

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|-----------|---|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| HWD | kg | 1,56E-02 | 1,09E-04 | 4,33E-05 | 1,58E-02 | 3,30E-05 | 1,77E-03 | 1,20E-05 | 8,02E-05 | 5,35E-03 |
| NHWD | kg | 6,46E+01 | 2,15E+00 | 2,39E+00 | 6,91E+01 | 2,76E+00 | 3,40E+01 | 3,28E+00 | 2,15E+02 | -2,29E+00 |
| RWD | kg | 2,13E-02 | 2,83E-04 | 7,61E-05 | 2,17E-02 | 7,23E-05 | 4,37E-03 | 2,36E-05 | 3,08E-04 | -4,99E-04 |
| Acronyms | HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed | | | | | | | | | |

Output flows - Results per declared unit

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|-----------|---|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| CRU | 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 |
| MFR | kg | 0,00E+00 | 0,00E+00 | 3,89E+00 | 3,89E+00 | 0,00E+00 | 0,00E+00 | 2,73E+01 | 0,00E+00 | 0,00E+00 |
| MER | kg | 0,00E+00 | 0,00E+00 | 1,88E-02 | 1,88E-02 | 0,00E+00 | 0,00E+00 | 1,84E+01 | 0,00E+00 | 0,00E+00 |
| EEE | 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 |
| EET | 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 |
| Acronyms | CRU = Components for re-use; MR = Material for recycling; MER = Materials for energy recovery; EEE = Exported energy, electricity; EET = Exported energy, thermal | | | | | | | | | |

Additional indicators - Results per declared unit

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|-----------|---|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PM | Disease Inc. | 4,05E-05 | 2,44E-07 | 1,97E-06 | 4,27E-05 | 8,29E-08 | 3,95E-06 | 5,63E-08 | 3,78E-07 | -8,40E-07 |
| IRP** | kBq U235 eq. | 4,78E+01 | 2,15E-01 | 1,86E-01 | 4,82E+01 | 6,80E-02 | 3,07E+00 | 3,03E-02 | 2,17E-01 | -1,55E+00 |
| ETP-fw* | CTUe | 2,64E+04 | 3,26E+01 | 5,31E+03 | 3,17E+04 | 3,79E+01 | 5,74E+02 | 9,06E+00 | 1,51E+02 | -2,67E+02 |
| HTP-nc* | CTUh | 6,49E-06 | 3,42E-08 | 1,26E-06 | 7,79E-06 | 5,33E-08 | 5,57E-07 | 4,21E-08 | 2,08E-08 | -1,74E-07 |
| HTP-c* | CTUh | 4,00E-07 | 1,06E-09 | 1,77E-08 | 4,19E-07 | 2,00E-09 | 1,70E-08 | 9,70E-10 | 1,46E-09 | -1,19E-09 |
| SQP* | Pt | 6,30E+03 | 2,87E+01 | 6,78E+00 | 6,34E+03 | 3,68E+00 | 4,53E+02 | 4,62E+00 | 1,27E+02 | -1,14E+02 |
| Acronyms | <p>CRU = Components for re-use; MR = Material for recycling; MER = Materials for energy recovery; EEE = Exported energy, electricity; EET = Exported energy, thermal</p> <p>* The results of this indicator should be used with caution given their high uncertainty or limited experience with the indicator Disclaimer</p> <p>** This impact category deals primarily with the possible impact on human health of low-dose ionizing radiation from the nuclear fuel cycle. Do not consider effects due to possible nuclear accidents, occupational exposure or due to the disposal of radioactive waste in underground landfills. Potential ionizing radiation from the ground, radon and some building materials are also not evaluated from this indicator.</p> | | | | | | | | | |

Biogenic carbon

The content of biogenic carbon in the product and packaging of the finished product was quantified according to EN 16449:2014.

| Biogenic carbon content | Biogenic carbon content in product [kg C] | Biogenic carbon content in accompanying packaging [kg C] |
|----------------------------------|---|--|
| Wood Wall / solid | 92,45 | 0,44 |
| Wood Wall / double glass | 10,45 | - |
| Wood Wall / single glass | 12,13 | - |
| Wood Wall / lateral single glass | 12,15 | - |

CALCULATION METHODOLOGY

The methodology followed as a reference standard is that of the Life Cycle Assessment (LCA); «LCA addresses environmental aspects and potential environmental impacts (e.g. resource use and environmental consequences of releases) throughout the product life cycle, from raw material acquisition through manufacturing and use, right through to end-of-life treatment, recycling and final disposal (i.e. from cradle to grave).» [ISO 14040:2021].

Declared Unit/ Functional Unit

The study was carried out using 1 product as a reference unit. The allocation was made on a mass basis.

Rules of Exclusion and Cut off

No cut-off considered.

Inputs excluded:

- employee travel;
- packaging of the auxiliary material;
- the natural gas used for heating offices and the company canteen.

Data quality

With reference to the EN 15804:2012+A2:2019 standard, the analysis describes specific products using specific data for the processes on which the manufacturer has an influence:

- all data related to the CORE phases are site specific;
- for UPSTREAM data, the data regarding BOM components (material, weight, quantity), raw materials, energy use, emissions and waste are derived from company databases and they are site-specific. The type of material and processes were taken from the Ecoinvent 3.8 database.

The company procures itself through the national energy system, and therefore the Italian residual mix is adopted, using as a source of data the latest AIB report (AIB, 2021).

With regards to the modelling of the particleboard and glass double glazing, the relative Ecoinvent datasets have been adapted to better suit their material composition.

The particleboard used for the solid wall is made of 93,6% recycled content, therefore the dataset *Particleboard, uncoated {RER}| market for particleboard, uncoated | Cut-off, U* was adjusted to that content by reportioning the internal inputs of *Particleboard, uncoated {RER}| particleboard production, uncoated, average glue mix | Cut-off, U*, namely those referring to Pulpwood and Wood chips.

Adjustments were made also to the dataset used for the specific laminated glass used which does not contain any gas (argon) and aluminium finishes. For this reason, the latter inputs contained within the dataset *Glazing, double, U<1.1 W/m2K, laminated safety glass {RER}| production | Cut-off, U* have been zeroed out.

Generic data

In the use of generic data, the following criteria were applied:

- geographic equivalence;
- technological equivalence;
- equivalence with respect to system boundaries.

For generic data, information between 2019 and 2022 was considered.

For the disposal scenarios, see the table below.

Assumptions / Scenarios

As for the steel trestles for transporting the glass, it was considered that the trestle is used at least twice a week for 2-3 years, so that the total weight (74 kg) is divided by the frequency of use multiplied by the kg transported (a transport of 3 m³ of glass of 27 kg/m³).

| Modules | Scenarios |
|---|--|
| C1 Disassembling | The partition walls are completely disassemblable. Therefore, its dismantling was modelled through the use of an 1100W hammer drill, while the use of a 16 kW mini electric crane with a maximum working height of 23.5m, suitable for glass installation and the installation of façades and steel structures, was considered for handling the glass. The installation and assembly time was estimated at 10 minutes. The respective Ecoinvent modules used are <i>Electricity, low voltage {GLO} market group for Cut-off, U</i> and <i>Machine operation, diesel, < 18.64 kW, low load factor {GLO} market for Cut-off, U</i> . |
| C2 Transport of the disassembled materials | A distance of 1000 km was considered for the transport of waste modelled with <i>Transport, freight, lorry 16-32 metric ton, EURO4 {RoW} transport, freight, lorry 16-32 metric ton, EURO4 Cut-off, U</i> . |
| C3 Waste management, recycling and energy recovery | The recycling and incineration with energy recovery refer to a global context. Different literature and Organisation reports sources were consulted for obtaining the percentage rates of waste processing at the end of life. The % rates and sources of the materials are: <ul style="list-style-type: none"> - Wood: 10% recycling; 70% incineration with energy recovery (Reindahl Andersen, M. et al., 2018); - Glass: 10% recycling (Reindahl Andersen, M. et al., 2018; Glass for Europe 2013) - Aluminium: 76% recycling (International Aluminium Institute, 2020). - Steel: 85% recycling (Arcelor Mittal, 2023). - ABS, PC, EPDM: 9% recycling; 19% incineration with energy recovery (OECD, 2023). |
| C4 Waste management, landfill disposal | The disposal scenarios refer to a global context. The % rates for the materials are: <ul style="list-style-type: none"> - Wood: 20% - Glass: 90% - Aluminium: 24% - Steel: 15% - ABS, PC, EPDM: 72% |
| D Benefits beyond the system boundaries | This module includes benefits related to material recycling and electrical energy production from material incineration. For wood, aluminium, steel, plastics and rubber, substitution of virgin material has been considered according to the respective % rates. For materials undergoing incineration, namely wood, plastics and rubber, the relative heating value was used to calculate the electricity production. The latter was then modelled with <i>Electricity, medium voltage {GLO} market group for Cut-off, U</i> . |

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