

# Environmental Product Declaration

In accordance with EN 15804  
and ISO 14025



## Thermosilence M

Date of publication: 2016-05-30. Validity: 3 years. Valid until: 2019-05-30. Based on PCR 2014:13 Insulation materials. Scope of the EPD®: Spain and Portugal.



EPD® registration number: S-P-00887  
Ecoplatform registration number:  
ECO EPD 00000356



ARLIBLOCK



LANA MINERAL



BA 15



THERMOSILENCE

  
**SAINT-GOBAIN**



## General information

**Manufacturer:** Isover-Saint Gobain Ibérica SL, Saint Gobain Placo Ibérica SA, Weber-Saint Gobain Ibérica SL. Calle Príncipe de Vergara 132. 28002 Madrid.

**Programme used:** The International EPD® System. More information at [www.environdec.com](http://www.environdec.com)

**EPD® registration number:** S-P-00887

**Ecoplatform registration number:** ECO EPD 00000356

**PCR identification:** PCR Multiple CPC codes Insulation materials version 1.0 (2014:13)

**Product name and manufacturer represented:** Thermosilence M; : Isover-Saint Gobain Ibérica SL, Placo-Saint Gobain Ibérica SL, Weber-Saint Gobain Ibérica SL

**Owner of the declaration:** Isover-Saint Gobain Ibérica SL, Saint Gobain Placo Ibérica SA, Weber-Saint Gobain Ibérica SL

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**Declaration issued:** 2016-05-30, **valid until:** 2019-05-30

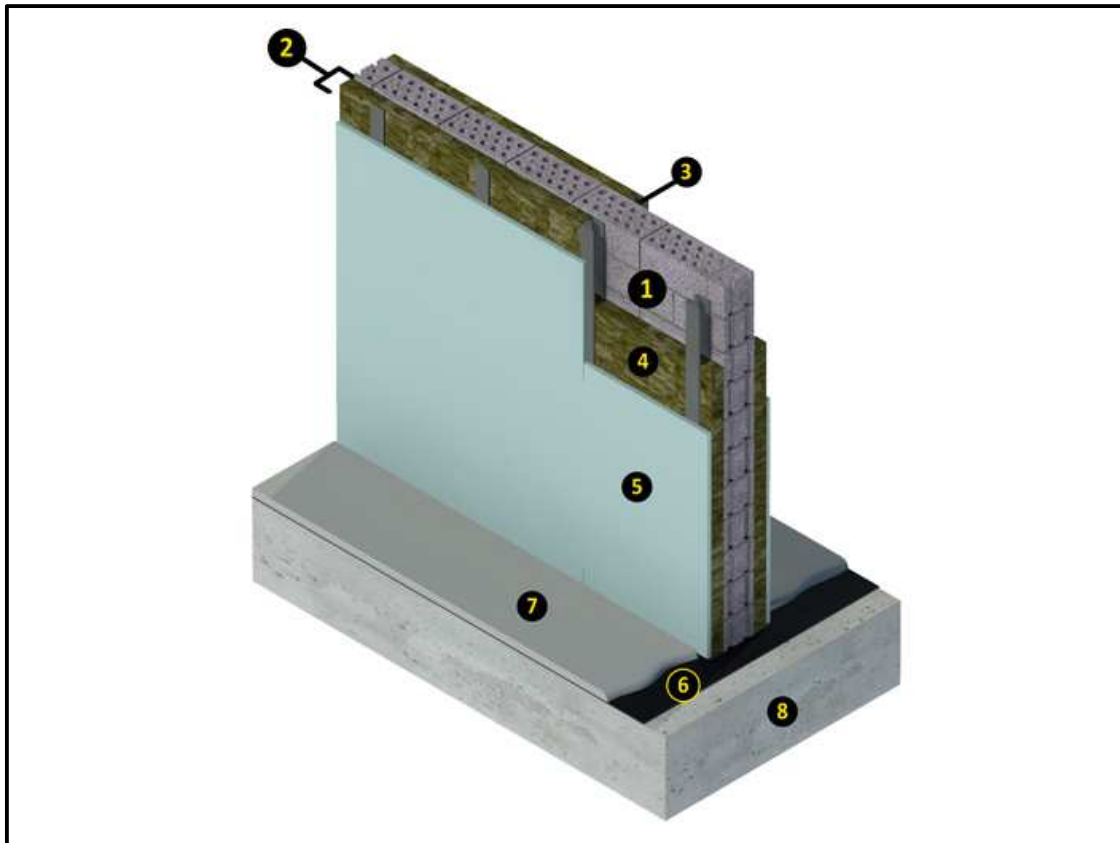
EPD program operator	The International EPD® System. Operated by EPD® International AB. <a href="http://www.environdec.com">www.environdec.com</a> .
PCR review conducted by	The Technical Committee of the International EPD® System
<b>LCA and EPD® performed by Isover Saint Gobain Ibérica, Weber Saint Gobain Ibérica and Saint Gobain Placo Ibérica SA</b>	
<b>Independent verification of the environmental declaration and data according to standard EN ISO 14025:2010</b>  <div style="display: flex; justify-content: space-around; align-items: center;"> <div>Internal <input type="checkbox"/></div> <div>External <input checked="" type="checkbox"/></div> </div>	
<b>Verifier accredited by The International EPD® System</b> Marcel Gómez Ferrer Marcel Gómez Consultoria Ambiental ( <a href="http://www.marcelgomez.com">www.marcelgomez.com</a> ) Tlf 0034 630 64 35 93 Email: <a href="mailto:info@marcelgomez.com">info@marcelgomez.com</a> Approved by: The International EPD® System	
<a href="http://www.isover.es">www.isover.es</a> <a href="http://www.weber.es">www.weber.es</a> <a href="http://www.placo.es">www.placo.es</a>	

## Product description

### Product description and description of use:

This Environmental Product Declaration (EPD®) describes the Environmental impacts of 1 m² of Thermosilence M with a thermal resistance of 1,0 K\*m²\*W⁻¹.

**THERMOSILENCE M** is a dividing wall system of Saint-Gobain both with high acoustic and thermal insulation composed of a double cladding with Laminated **Gypsum Plasterboard Placo BA 15** and **Isover Arena** mineral wool over **Arliblock® 12** brick. The combination of the most innovative products from Isover, Weber and Placo allows obtaining the solution with the best performance in the market.



1. **Arliblock® 12** brick
2. Placo Prima System sheeting wall
3. M 48 downpipe from Placo
4. **Arena's** mineral wool
5. **BA 15** Laminated Gypsum Board with 15 mm of thickness
6. Expanded polyethylene anti-impact sheet
7. Floating pavement over acoustic insulation with self-levelling **weber.floor rapid** mortar
8. Floor framing

### Main components



#### ARLIBLOCK® 12 BRICK

Arliblock®12 brick made with Arlita® Leca® expanded clay, cement, natural stone, additives and water.



#### ARENA MINERAL WOOL

Semirigid panels and rolls of **Arena** mineral wool, hydrophobic, without coating. Designed to reach the highest thermal and acoustic properties in construction.



#### BA 15

Laminated Gypsum Board with double facing cardboard and natural origin gypsum heart.

## Descriptive report

Self-holding sheeting wall with **BA 15** Laminated Gypsum Board of 15 mm of thickness and **Arena** Mineral Wool, in panels or rolls of 50 mm of thickness, specifically developed to use in constructions with high acoustic insulation requirements, with a thermal conductivity of 0,035 W/(m•K), A1 class fire reaction, and **Arliblock**<sup>®</sup> brick with 12 cm of thickness prefabricated with Arlita<sup>®</sup> Leca<sup>®</sup> expanded clay. The system is filled by both sides with 5 mm of **weber.rev hidro** mortar, being the total weight of the system 183 Kg/m<sup>2</sup>, and it is composed by a holding metallic structure where a **BA 15** Laminated Gypsum Board is screwed by its internal side. The thickness of the finished sheeting wall is 250 mm. Proportional parts of screws, plasters and tape for junctions, anchoring for floor and roof, etc. Completely finished, ready to prime and decorate. Mineral wool heart of 50 mm of thickness. Variable total width of the unit. Assembly of the holding framework unit following UNE 102043.

### Technical data/physical characteristics (for a thickness of 25 cm including 5+5 cm of Arena insulation panel):

Thermal resistance of Thermosilence M: **3,44 K.m<sup>2</sup>.W<sup>-1</sup>** (UNE EN 12667)

Thermal conductivity of Thermosilence M (for Arena insulation panel): **0,035 W/(m•K)** (UNE EN 12667)

Reaction to fire: Euroclass (for Arena insulation panel): **A1** (UNE EN 13501-1)

Acoustic properties (for Arena insulation panel): **AW 0,7** (UNE EN ISO 354)

Water vapour transmission (for Arena insulation panel): **μ=1** (UNE EN 12086)

**Description of the main components and/or materials for 1 m<sup>2</sup> of Thermosilence M with a thermal resistance of 1 K.m<sup>2</sup>.W<sup>-1</sup> for the calculation of the EPD<sup>®</sup> (7,25 cm of thickness). In order to obtain the results for the real thickness of the system (25 cm) results must be multiplied by 3,44.**

PARAMETER	VALUE
Quantity of Arliblock <sup>®</sup> 12	37,68 Kg
Quantity of Isover Arena insulation panel	0,608 Kg
Thickness of wool	14,49 mm
Quantity of Placo BA 15 laminated gypsum board	6,359 Kg
Quantity of Weber.rev hidro mortar	5,227 Kg
Packaging for the transportation and distribution	Polyethylene: negligible Wood pallet (reused) Paper for the label: negligible
Products used for the Installation	Placo M48 downpipe: 0,177 Kg Screws: 0,004 Kg Joint filler: 0,101 Kg Water: 0,048 l

During the life cycle of the product any hazardous substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization<sup>1</sup>" has been used in a percentage higher than 0,1% of the weight of the product.

<sup>1</sup> [http://echa.europa.eu/chem\\_data/authorisation\\_process/candidate\\_list\\_table\\_en.asp](http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp)

## LCA calculation information

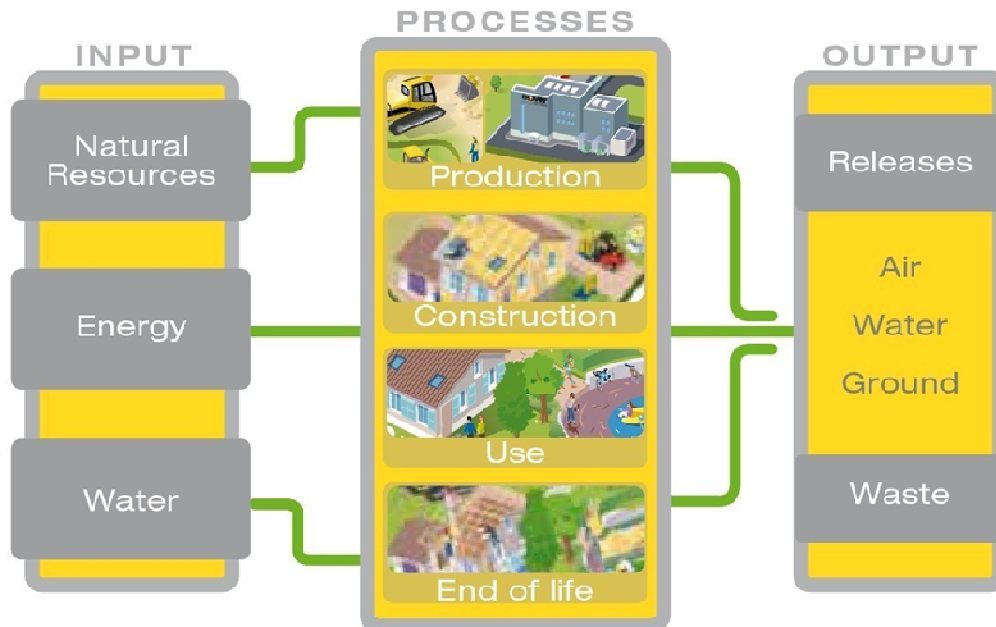
<b>FUNCTIONAL UNIT</b>	Providing a thermal insulation on 1 m <sup>2</sup> of product with a thermal resistance of 1 K.m <sup>2</sup> .W <sup>-1</sup>
<b>SYSTEM BOUNDARIES</b>	Cradle to Grave: Mandatory stages = A1-3, A4-5, B1-7, C1-4. Optional stage = D not taken into account
<b>REFERENCE SERVICE LIFE (RSL)</b>	50 years
<b>CUT-OFF RULES</b>	<p>In the case that there is not enough information, the process energy and materials representing less than 1% of the whole energy and mass used can be excluded (if they do not cause significant impacts). The addition of all the inputs and outputs excluded cannot be bigger than the 5% of the whole mass and energy used, as well of the emissions to environment occurred. Flows related to human activities such as employee transport are excluded.</p> <p>The construction of plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the production of the building product when compared at these systems lifetime level.</p>
<b>ALLOCATIONS</b>	Allocation criteria are based on mass
<b>GEOGRAPHICAL COVERAGE AND TIME PERIOD</b>	Spain and Portugal 2015

- “EPDs of construction products may be not comparable if they do not comply with EN 15804”
- “Environmental Product Declarations within the same product category from different programs may not be comparable”



# Life cycle stages

## Flow diagram of the Life Cycle



## Product stage, A1-A3

**Description of the stage:** the product stage of Thermosilence M 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 15 804 standard. This rule is applied in this EPD®.

### Description of the scenarios and other additional technical information:

#### A1, Raw materials supply

This module takes into account the extraction and processing of all raw materials and energy which occur upstream to the studied manufacturing process: Arliblock® 12, Isover Arena, Placo BA15 and Weber.rev hidro.

#### A2, Transport to the manufacturer

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

#### A3, Manufacturing

This module includes the manufacturing of the components of the product and their packaging.

## 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.

**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/DESCRIPTION
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.	Average truck trailer with a 16-32t payload, diesel consumption of 26 litres for 100 km
Distance	Arliblock <sup>®</sup> 12: 50 Km Isover Arena insulation panel: 450 Km Placo BA 15 laminated gypsum board: 428 Km Weber.rev hidro mortar: 500 Km Installation materials (screws, etc):50 km
Capacity utilisation (including empty returns)	100 % of the capacity in volume % of empty returns assumed in Ecoinvent 3.1
Bulk density of transported products	Arliblock <sup>®</sup> 12: 1.080 Kg/m <sup>3</sup> Isover Arena insulation panel: 14,7 Kg/m <sup>3</sup> Placo BA 15 laminated gypsum board: 738 Kg/m <sup>3</sup> Thermosilence M whole system: 686 kg/m <sup>3</sup>
Volume capacity utilisation factor	1

**A5, Installation in the building:** this module includes:

- Waste produced during the installation of the product (see value in percentage shown in the next table). These losses are sent to landfill
- Additional manufacturing processes done in order to compensate losses
- Packaging waste processing, which are 100% collected and recycled

PARAMETER	VALUE/DESCRIPTION
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	2,0 %
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)	Product packaging waste is 100% collected and recycled. Following a conservative methodology Thermosilence M losses are considered to be 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 the 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 Thermosilence M has no impact (excluding potential energy savings) on this stage.

## End of Life Stage, C1-C4

**Description of the stage:** this stage includes the next modules:

### C1, Deconstruction, demolition

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

### C2, Transport to waste processing

The model use for the transportation (see A4, transportation to the building site) is applied.

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

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

### C4, Disposal

Thermosilence M is assumed to be 100% landfilled.

**Description of the scenarios and additional technical information:**

End of life:

PARAMETER	VALUE/DESCRIPTION
Collection process specified by type	50,16 Kg (collected with mixed construction waste)
Recovery system specified by type	No re-use, recycling or energy recovery
Disposal specified by type	50,16 Kg landfilled
Assumptions for scenario development (e.g. transportation)	Average truck trailer with a 16-32t payload, diesel consumption of 26 litres for 100 km 50 km of average distance to landfill

## Reuse/recovery/recycling potential, D








**Description of the stage:** module D has not been taken into account.

## LCA results









LCA model, aggregation of data and environmental impact are calculated from Simapro 8 software. CML impact method has been used, together with Ecoinvent 3.1 database to obtain the inventory of generic data. EDIP 2003 impact model has been used for the calculation of waste production indicators.

Raw materials and energy consumption for Isover-Saint Gobain, Placo-Saint Gobain and Weber-Saint Gobain products, as well as transport distances have been taken directly from the manufacturing plants in Spain in 2014. Note that the results refer to 1 m<sup>2</sup> of Thermosilence M with a thermal resistance of 1 K.m<sup>2</sup>.W<sup>-1</sup>. To obtain the environmental results of the real thickness of the product (25 cm) please multiply the results shown by 3,44.






ENVIRONMENTAL IMPACTS															
Parameters	Product stage	Construction 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) - <i>kg CO2 equiv/FU</i>	1,01E+01	1,27E+00	1,00E+00	0	0	0	0	0	0	0	Irrelevant	4,24E-01	0	3,82E-01	MND <sup>2</sup>
	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) <i>kg CFC 11 equiv/FU</i>	7,31E-07	2,33E-07	9,01E-08	0	0	0	0	0	0	0	Irrelevant	7,79E-08	0	1,11E-07	MND
	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) <i>kg SO2 equiv/FU</i>	4,18E-02	5,23E-03	4,40E-03	0	0	0	0	0	0	0	Irrelevant	1,72E-03	0	2,79E-03	MND
	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) <i>kg (PO4)3- equiv/FU</i>	9,82E-03	1,12E-03	1,52E-03	0	0	0	0	0	0	0	Irrelevant	3,74E-04	0	7,16E-04	MND
	Excessive enrichment of waters and continental surfaces with nutrients, and the associated adverse biological effects.														
 Photochemical ozone creation (POPC) <i>Ethene equiv/FU</i>	1,95E-03	2,21E-04	4,12E-04	0	0	0	0	0	0	0	Irrelevant	7,30E-05	0	1,24E-04	MND
	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) - <i>kg Sb equiv/FU</i>	1,28E-05	4,13E-06	3,78E-06	0	0	0	0	0	0	0	Irrelevant	1,38E-06	0	4,42E-07	MND
 Abiotic depletion potential for fossil resources (ADP-fossil fuels) - <i>MJ/FU</i>	1,02E+02	2,04E+01	1,27E+01	0	0	0	0	0	0	0	Irrelevant	6,80E+00	0	9,81E+00	MND
	Consumption of non-renewable resources, thereby lowering their availability for future generations.														

<sup>2</sup> MND= Module Not Declared





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	1,54E+01	2,40E-01	8,37E-01	0	0	0	0	0	0	0	Irrelevant	8,10E-02	0	2,69E-01	MND
 Use of renewable primary energy used as raw materials MJ/FU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) MJ/FU	1,54E+01	2,40E-01	8,37E-01	0	0	0	0	0	0	0	Irrelevant	8,10E-02	0	2,69E-01	MND
 Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - MJ/FU	1,02E+02	2,04E+01	1,27E+01	0	0	0	0	0	0	0	Irrelevant	6,80E+00	0	9,81E+00	MND
 Use of non-renewable primary energy used as raw materials MJ/FU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - MJ/FU	1,02E+02	2,04E+01	1,27E+01	0	0	0	0	0	0	0	Irrelevant	6,80E+00	0	9,81E+00	MND
 Use of secondary material kg/FU	4,16E-02	0	0	0	0	0	0	0	0	0	Irrelevant	0	0	0	MND
 Use of renewable secondary fuels- MJ/FU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
 Use of non-renewable secondary fuels - MJ/FU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
 Use of net fresh water - m3/FU <sup>3</sup>	9,82E-02	3,57E-03	8,20E-03	0	0	0	0	0	0	0	Irrelevant	1,39E-03	0	9,36E-03	MND

<sup>3</sup> Neither the use of water in turbinage or cooling during the production of hydraulic and nuclear electricity have been taken into account.

## 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 <i>kg/FU</i>	8,19E-05	1,15E-05	7,84E-05	0	0	0	0	0	0	0	Irrelevant	3,86E-06	0	6,85E-06	MND
 Non-hazardous waste disposed <i>kg/FU</i>	1,04E+00	8,99E-01	1,21E+00	0	0	0	0	0	0	0	Irrelevant	3,01E-01	0	4,89E+01	MND
 Radioactive waste disposed <i>kg/FU</i>	4,58E-04	1,32E-04	3,93E-05	0	0	0	0	0	0	0	Irrelevant	4,42E-05	0	6,50E-05	MND

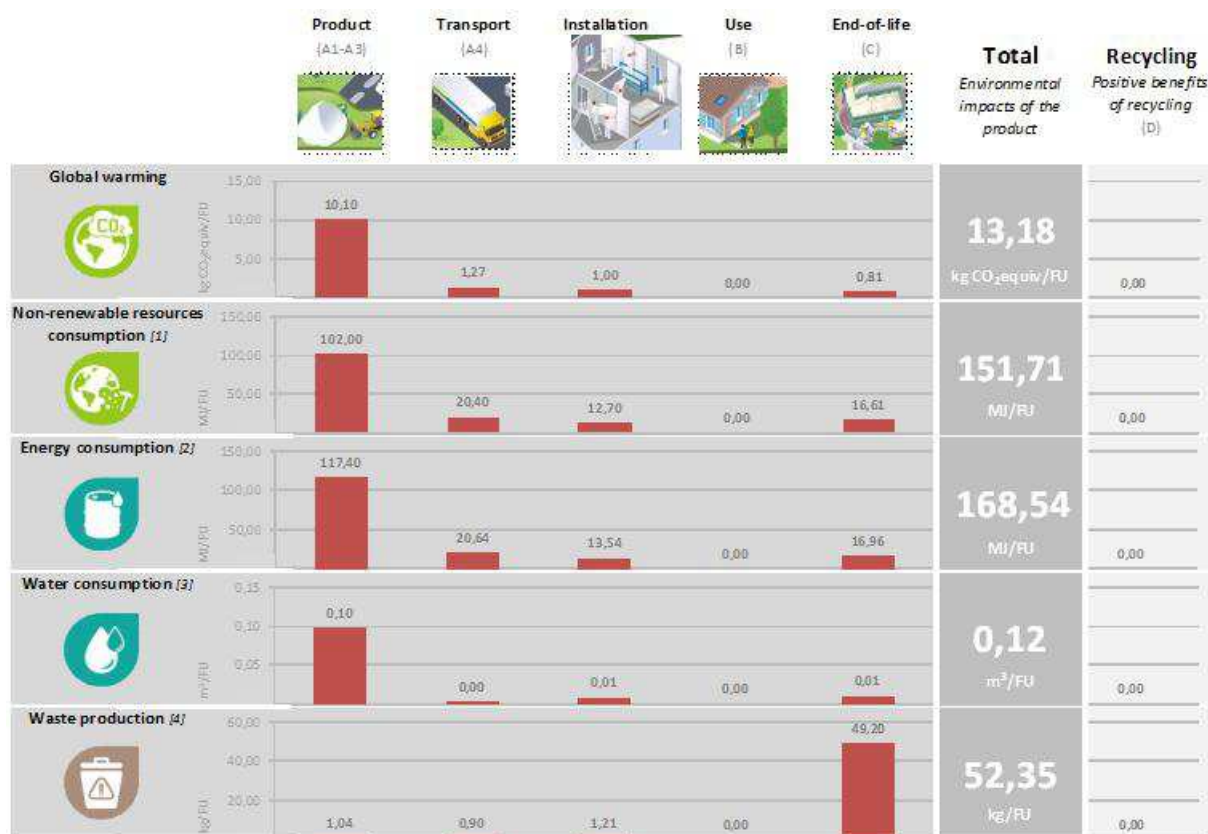
# OTHER OUTPUT FLOWS

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 <i>kg/FU</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	MND
 Materials for recycling <i>kg/FU</i>	6,43E-02	9,30E-07	1,26E-02	0	0	0	0	0	0	0	Irrelevant	5,36E-08	0	0	MND
 Materials for energy recovery <i>kg/FU</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	MND
 Exported energy <i>MJ/FU</i>	0	0	0	0	0	0	0	0	0	0	Irrelevant	0	0	0	MND

## LCA interpretation

The Product stage (A1-A3) is the life cycle stage with the biggest impact, since it represents more than 67% of the whole impact of the product for the next impact categories: Global warming, Non-renewable resources consumption, energy and water consumption.

Waste production is mainly produced during the End of life stage (94% of the whole impact). This is due to the fact that 100% of the product is landfilled at the end of its service life.



[1] This indicator corresponds to the abiotic depletion potential of fossil resources.

[2] This indicator corresponds to the total use of primary energy.

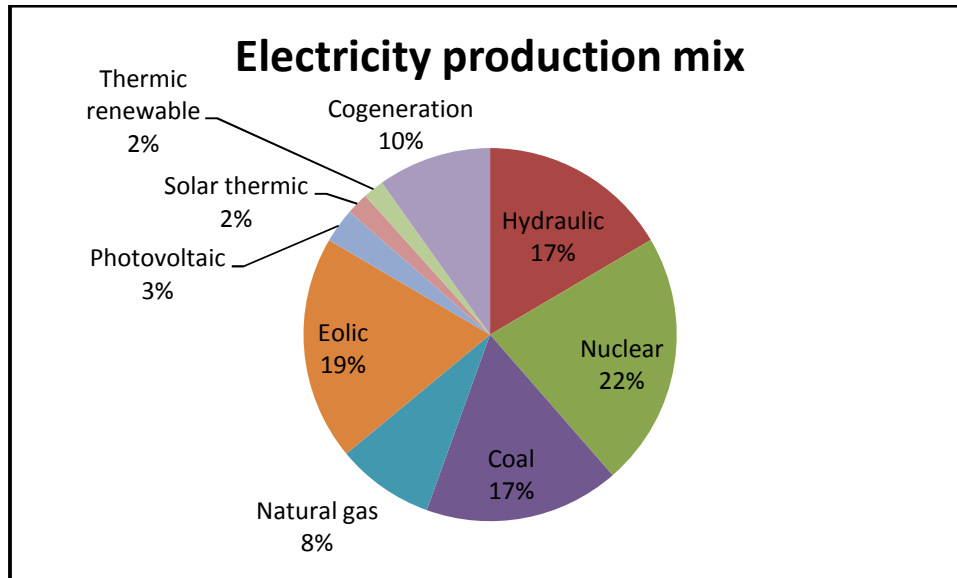
[3] This indicator corresponds to the use of net fresh water.

[4] This indicator corresponds to the sum of hazardous, non-hazardous and radioactive waste disposed.

## Additional information

The electricity production mix considered for A1-A3 product stage is the Spanish electricity production mix in 2014<sup>4</sup>.

The composition of the electricity production mix used is detailed in the next figure.



## Bibliography

- ISO 14040:2006: Environmental Management-Life Cycle Assessment-Principles and framework.
- ISO 14044:2006: Environmental Management-Life Cycle Assessment-Requirements and guidelines.
- ISO 14025:2006: Environmental labels and declarations-Type III Environmental Declarations-Principles and procedures.
- PCR Multiple UN CPC codes Insulation materials (2014:13) version 1.0
- UNE-EN 15804:2012: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
- General Programme Instructions for the International EPD® System, version 2.5.
- UNE-EN 12667:2002: Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance.
- UNE-EN 13501-1: 2010: Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.
- UNE-EN ISO 354:2004: Acoustics - Measurement of sound absorption in a reverberation room.
- UNE-EN 12086:1998: Productos aislantes térmicos para aplicaciones en la edificación. Determinación de las propiedades de transmisión del vapor de agua.

<sup>4</sup> Source: Red Eléctrica Española.