ENVIRONMENTAL PRODUCT DECLARATION

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

C30/37 Concrete

"EPD of multiple products, based on the average results of the product group"

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com.

Programme:
The International EPD® System
www.environdec.com

Programme Operator:
EPD International AB

Licensee:
EPD Türkiye

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Geographical Scope:
Global

EPD® THE INTERNATIONAL EPD® SYSTEM

TÜRKİYE EPD® THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD VERIFIED

Programme Information

Programme

EPD registered through licensee:
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CEN standard EN 15804 serves as the core Product Category Rules (PCR)

Product Category Rules (PCR):

PCR 2019:14 Construction products, version 1.3.4, Construction EN 15804:2012+A2:2019/AC:2021 Sustainability of Construction Works and c-PCR-003 Concrete and concrete elements (EN 16757) (2023-01-02).

UN CPC code:
Division 375 “Articles of concrete, cement and plaster

PCR review was conducted by: The Technical Committee of the International EPD® System.

External and independent (‘third-party’) verification of the declaration and data, according to ISO 14025:2006, via

EPD process certification EPD verification **X**

Third party individual verifier: Stephen Forson, ViridisPride Ltd.

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes No **X**

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

About Company

Çimsa, a subsidiary of Sabancı Holding, was founded in Mersin in 1972. Today, Çimsa conducts its manufacturing operations through its three integrated plants in Mersin, Eski ehir, and Afyonkarahisar, Turkey, an integrated cement plant in Buñol, Spain, a cement grinding facility in the USA, and terminals in Germany, Spain, Italy, and the TRNC. Çimsa is one of the leading global brands in white cement and sustains its global operations through Sabancı Building Solutions, a company founded by integrating Çimsa's operational capability with the financial strength of Sabancı Holding, Çimsa's main shareholder. In addition to white cement and calcium aluminate cement with an EPD certificate, it is strengthening its position as a global cement manufacturer by adding more environmentally friendly products to its portfolio, including grey cement.

Thanks to its market-oriented approach and extensive distribution network, Çimsa meets the product and service requirements of its customers fully and on time. As a reliable business partner for its stakeholders, the company provides the necessary materials for long-lasting living spaces and infrastructure for future generations. Çimsa pioneers the Turkish cement and building materials industry in terms of innovation with its special products, including white cement and calcium aluminate cement, in addition to grey cement. Focusing on profitable growth and creating value for all its stakeholders, Çimsa's goal is to sustain and expand these achievements in the future.

About Sabancı Building Solutions

Sabancı Building Solutions aims to grow the Building Materials Portfolio of Sabancı Holding in developed geographies with sustainable products and solutions. Sabancı Building Solutions plans to transform its existing portfolio through the acquisition of businesses, with an emphasis on ESG principles, in alignment with Sabancı Holding's commitment to achieving Net Zero by 2050.

Additionally, the company will continue shaping the future through investments in the Construction Tech ecosystem, focusing on advanced materials, decarbonization, digitalization, and productivity.

About Product

Çimsa C30/37 concrete products consist of cement, fine and coarse aggregates, water, chemical additives for various purposes, and cementitious materials, in accordance with the TS EN 206-1 standard at Çimsa's concrete plants.

The use of chemical additives in concrete has positive effects on the fresh and hardened properties of concrete due to its lower cement and water content.

In addition, the use of fly ash and blast furnace slag in concrete improves the workability and durability of the concrete. Gradation determines the proportions of aggregates to be used in different sizes in concrete.

This EPD is prepared for the declared C30/37 concrete product manufactured by Çimsa at different concrete plants in Türkiye.

No packaging material is used for the product.

Advantages in applications;

- The product exhibits sustainable properties by generating fewer greenhouse gas emissions due to its reduced cement content.
- With the special chemicals used in the product, the concrete can be transported over longer distances while maintaining its high strength.

Application areas;

- The product is suitable for producing various structures such as residential buildings, bridges, foundations, viaducts, and mass concrete.

Product Composition

Product Composition	Weight (%)	Post-consumer material weight- %	Biogenic material kg C / declared unit
Cement	12 - 14	0	0
Water	5 - 10	0	0
Aggregates	30 - 40	0	0
Sand	30 - 45	0	0
Admixture	0.1 - 0.5	0	0
Additives (SCM, fiber etc.)	0 - 10	0	0

About Product

Included Production Plants

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Afyon Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Adapazarı Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Denizli Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Eskisehir Batı Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Eskisehir Kuzey Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Eskisehir Organize Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Eskisehir Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Kütahya Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Kütahya – 2 Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Misis Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Osmaniye Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Sağlıklı Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Silifke Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Tarsus Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Tece Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Yenihal Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Incirlik Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Inegöl Hazır Beton Tesisi Şubesi

• Çimsa Çimento Ticaret ve Sanayi A.Ş. Zeytinli Hazır Beton Tesisi Şubesi

Properties	Çimsa Values	Standart Limit (EN 206-1)	
		Min.	Max.
Cement (kg/m^3)	Approx. 310	260	-
W/C ratio	Approx. 0.55	-	0.65
Consistency Class	S3 and S4	S1	S5
Exposure Class	>XC1	XC1	-
Temperature (C)	Aprox. 20	5	35
28-Day Compressive Strength (Cube) (MPa)	39 - 47	37	-

LCA Information

Declared Unit	1 m^3 of C30/37 Concrete
Time Representativeness	2023
Database(s) and LCA Software Used	Ecoinvent 3.9.1. SimaPro 9.5

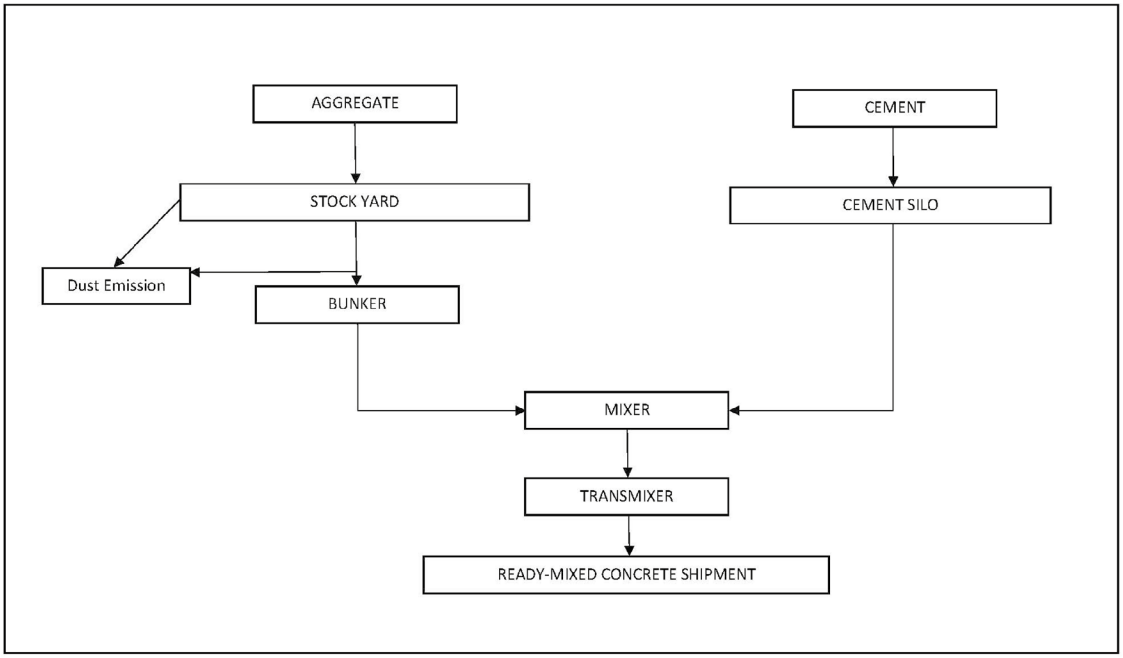
The inventory for the LCA study is based on the 2023 production figures for Çimsa's C30/37 concrete.

This EPD's system boundary is cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + C + D and A5 & B1). The results of the LCA, with the indicators as per EPD requirements, are provided in the following tables for the product's manufacture, transportation, and installation stages, as well as the end-of-life stages.

	Product Stage			Construction Process Stage		Use Stage							End of Life Stage				Benefits and Loads
	Raw Material Supply	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction / Demolition	Transport	Waste Processing	Disposal	Future reuse, recycling or energy recovery potentials
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	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	TR	GLO	GLO	GLO	-						GLO				
Specific Data Used	90.5%				-												
Variation - Products	0%				-												
Variation - Sites	49.7%				-												

GLO: Global, TR: Türkiye, X = Module included, ND = Not declared

System Boundaries



A1: Raw Material Supply
This stage includes raw material extraction and pre-treatment processes before production. The main materials used in production are cement, water, aggregates, chemical additives, and cementitious materials. The impacts of these materials are considered at this stage.

A2: Raw Material Transport
This stage includes the transportation-related impacts of the materials needed for concrete production. It is observed that highway transportation is involved at this stage. Transport routes and distances are supplier-specific and provided by the manufacturer.

A3: Manufacturing
This stage includes the production-related environmental impacts of the investigated product. The following production steps are considered:

Aggregates are brought to the facility by vehicles and stored in stock areas. They are filled into bunkers according to their type by means of a loader. Then, the aggregates are weighed, transported via the conveyor belt, and taken to the holding bunker. Cement is brought to the facility by specially designed bulk trucks and stored in closed silos. The cement is then transferred to the holding bunker by augers and weighed. Ready-mixed concrete additives are delivered to the facility by tankers and stored in fixed tanks. These additives, both liquid and powder, are used to increase strength, density, and workability in concrete, such as by reducing water content, ensuring fluidity, accelerating the initial setting, reducing the amount of mixing water, and acting as antifreeze, among other effects. The additives are pumped to the holding bunker and weighed. If the mixing water is sourced from the mains, it is filled into the water tank from the recycling pond. The mixing water is then pumped to the holding bunker and weighed. The weighed materials are added to the mixer, and wet concrete is produced by mixing them for at least 30 seconds. The finished wet concrete is discharged from the mixer into the transit mixer, ready for shipment.

System Boundaries

A4: Transport to Customer
This stage concerns the delivery of the final product to the intended markets and customers. Highway transportation is used at this stage. The transport routes and distances are supplier-specific and provided by the manufacturer.

A5: Installation
The diesel consumption and efficiency of the concrete mixer truck and the concrete pump at the construction site are included. Water consumption is assumed to be 669 litres/m^3 during this stage.

B1: Use
Due to the calcination of cement during its use phase, concrete absorbs some CO_2 emissions from the atmosphere over its lifespan. Following the relevant standard, EN 16757, the calcination-related recarbonation impact is calculated. Since the final application of the product is unkown, a correction factor of 0.15 is used as stated in the relevant standard. Below table list the main parameters for calcination calculation.

*U_{tcc} for CEM I	0.49
U_{tcc} adjusment factor for CEM II cement	85/95
**Correction factor	0.15
CO_2 uptake for 1 kg of cement (kg CO_2 eq.)	6.58E-02
CO_2 uptake for 1 m^3 of investigated concrete (kg CO_2 eq.)	20.2

C1 - Deconstruction
This stage includes the demolition or deconstruction of the discarded concrete from the construction sites. It is assumed that a medium-sized (129 kW) excavator will be used.

C2 - Waste Transport
This stage covers the transportation-related impacts of the discarded concrete. Due to a lack of information and variances, a 50 km transportation distance using Euro 5 motor trucks is assumed.

C3 - Waste Processing
Any waste processing for the discarded concrete is included in this stage. In addition, according to EN 16757, when the end-of-life conditions of concrete cannot be defined at the time when the EPD is drafted, simplified conservative approach for assessing the CO_2 uptake of concrete can be used. Based on this method, 5 kg CO_2 eq. uptake for 1 m^3 of concrete is assumed.

C4 - Disposal
The recycled portion of waste concrete can substitute the use of aggregates in future concrete-making processes. According to the Cement Sustainability Initiative (CSI), this substitution can range from 10% to 45%. In this study, a 30% substitution is assumed. The remaining portion is assumed to be landfilled, and its impact is calculated at this stage.

D - Future reuse, recycling, and energy recovery potentials
The recycled portion of waste concrete can substitute the use of aggregates in future concrete-making processes. This benefit is allocated accordingly.

More Information

System Boundary
Cradle-to-gate with options, modules C1–C4, module D, and optional modules (A4, A5, and B1).

Conversion factor
1 m^3 of the investigated concrete weighs an average of 2502 kg. Therefore, a mass conversion factor of 0.0004 should be used.

Cut-Off Rules
A 1% cut-off is applied. Data for elementary flows to and from the product system, contributing to a minimum of 99% of the declared environmental impacts, have been included.

REACH Regulation
No substances included in the Candidate List of Substances of Very High Concern for authorisation under the REACH regulations are present in this product either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

Background Data / Specific Data
For LCA modelling and calculation, the ecoinvent database (v3.9.1) and SimaPro (v9.5) LCA software were used. Characterization factors from the EN 15804 reference package based on EF 3.1 are utilized. The impact of infrastructure and capital goods is excluded from the analysis.

Biogenic Carbon Content
The product does not contain biogenic carbon, and thus, there is no biogenic carbon content in the product. Additionally, there is no use of packaging, as the product is sold fresh via concrete mixers.

Period Under Review
The data used for the LCA study pertains to the year 2023.

Allocations
Energy consumption was weighted according to the production figures for the relevant period. In addition, hazardous and non-hazardous waste amounts were also allocated from the total waste generated during the specified time interval.

Electricity
The electricity data used in manufacturing is taken from the Ecoinvent 3.9.1 database, which represents medium voltage electricity production in Türkiye. The data used has a GWP-GHG impact of 0.578 kg CO_2 eq. / kWh based on the reference year 2017.

- Coal, 37%
- Hydro, 33%
- Natural gas, 17 %
- Wind, 8%
- Geothermal, 3%
- Biogas, 1%
- Other, 1%
- Biomass, <1%

Assumptions
Upstream and downstream road transportation are assumed to be carried out using Euro 5 motor vehicles with a size class of over 32 metric tonnes, with distances acquired through Google Maps.

LCA Results

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The results of this EPD should not be used without the consideration of Module C.

Core environmental impact indicators (Mandatory)										
Impact Category	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
GWP - Fossil	kg CO_2 eq.	3.19E+02	1.76E+01	2.63E+00	-2.02E+01	6.91E+00	1.30E+01	8.79E-01	2.27E+01	-7.61E+00
GWP - Biogenic	kg CO_2 eq.	1.67E-01	5.94E-03	1.69E-03	0.00E+00	9.61E-04	4.19E-03	2.05E-02	6.40E-02	-1.05E-02
GWP - Luluc	kg CO_2 eq.	3.05E-01	8.06E-03	1.30E-03	0.00E+00	7.78E-04	6.11E-03	6.36E-02	1.65E-02	-7.66E-03
GWP - Total	kg CO_2 eq.	3.20E+02	1.76E+01	2.63E+00	-2.02E+01	6.91E+00	1.30E+01	9.64E-01	2.27E+01	-7.63E+00
ODP	kg CFC-11 eq.	3.90E-06	3.83E-07	4.15E-08	0.00E+00	1.10E-07	2.84E-07	3.59E-08	5.32E-07	-7.00E-08
AP	mol H+ eq.	9.68E-01	5.48E-02	2.11E-02	0.00E+00	6.41E-02	4.37E-02	3.83E-02	1.61E-01	-4.70E-02
EP - Freshwater	kg P eq.	6.55E-03	1.38E-04	3.96E-05	0.00E+00	2.50E-05	1.05E-04	6.59E-04	3.26E-04	-2.91E-04
EP - Marine	kg N eq.	2.47E-01	1.85E-02	8.56E-03	0.00E+00	2.97E-02	1.50E-02	5.18E-03	5.97E-02	-1.06E-02
EP - Terrestrial	mol N eq.	2.77E+00	1.98E-01	9.33E-02	0.00E+00	3.23E-01	1.60E-01	5.77E-02	6.45E-01	-1.33E-01
POCP	kg NMVOC	9.65E-01	8.22E-02	2.79E-02	0.00E+00	9.56E-02	6.81E-02	1.69E-02	2.18E-01	-3.75E-02
*ADPE	kg Sb eq.	3.05E-04	5.61E-05	4.40E-06	0.00E+00	2.41E-06	3.50E-05	5.74E-06	4.60E-05	-3.98E-05
*ADPF	MJ	2.81E+03	2.48E+02	3.35E+01	0.00E+00	9.05E+01	1.90E+02	5.59E+01	4.91E+02	-9.39E+01
*WDP	m^3 depriv.	1.40E+02	9.39E-01	2.74E+01	0.00E+00	1.95E-01	9.08E-01	2.99E+00	2.08E+01	-1.10E+01
Additional environmental impact indicators (Mandatory)										
**GWP-GHG	kg CO_2 eq.	3.20E+02	1.76E+01	2.64E+00	-2.02E+01	6.92E+00	1.30E+01	9.66E-01	2.28E+01	-7.64E+00
Additional environmental impact indicators (Optional)										
PM	disease inc.	8.17E-06	1.20E-06	5.20E-07	0.00E+00	1.79E-06	1.31E-06	1.74E-07	3.46E-06	-6.81E-07
***IR	kBq U-235 eq.	1.45E+00	1.45E-01	3.37E-02	0.00E+00	1.85E-02	9.14E-02	1.61E-02	2.54E-01	-2.95E-01
ETP-FW	CTUe	1.25E+03	1.25E+02	1.49E+01	0.00E+00	4.33E+01	9.14E+01	1.52E+01	2.15E+02	-3.09E+01
*HTP - C	CTUh	7.88E-08	7.37E-09	2.51E-09	0.00E+00	2.12E-09	5.62E-09	1.15E-09	1.27E-08	-6.35E-09
*HTP - NC	CTUh	2.14E-06	1.64E-07	3.15E-08	0.00E+00	1.47E-08	1.37E-07	4.66E-08	1.42E-07	-8.11E-08
*SQP	Pt	1.34E+03	1.27E+02	3.65E+00	0.00E+00	6.10E+00	1.93E+02	5.51E+00	1.12E+03	-8.46E+01
Acronyms	GWP-total: Climate change, GWP-fossil: Climate change- fossil, GWP-biogenic: Climate change - biogenic, GWP-luluc: Climate change - land use and transformation, ODP: Ozone layer depletion, AP: Acidification terrestrial and freshwater, EP-freshwater: Eutrophication freshwater, EP-marine: Eutrophication marine, EP-terrestrial: Eutrophication terrestrial, POCP: Photochemical oxidation, ADPE: Abiotic depletion - elements, ADPF: Abiotic depletion - fossil resources, WDP: Water scarcity, PM: Respiratory inorganics - particulate matter, IR: Ionising radiation, ETP-FW: Ecotoxicity freshwater, HTP-c: Cancer human health effects, HTP-nc: Non-cancer human health effects, SQP: Land use related impacts, soil quality.									
Legend	A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A4: Transport, A5: Installation, B1: Use, C1: Deconstruction, C2: Waste Transport, C3: Waste Processing, C4: Disposal, D: Benefits									

LCA Results

Indicators describing resource use (Mandatory)										
Impact Category	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
PERE	MJ	1.17E+02	4.33E+00	1.08E+00	0.00E+00	5.16E-01	2.79E+00	1.85E+01	8.47E+00	-8.38E+00
PERM	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
PERT	MJ	1.17E+02	4.33E+00	1.08E+00	0.00E+00	5.16E-01	2.79E+00	1.85E+01	8.47E+00	-8.38E+00
PENRE	MJ	2.81E+03	2.48E+02	3.35E+01	0.00E+00	9.05E+01	1.90E+02	5.59E+01	4.91E+02	-9.39E+01
PENRM	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
PENRT	MJ	2.81E+03	2.48E+02	3.35E+01	0.00E+00	9.05E+01	1.90E+02	5.59E+01	4.91E+02	-9.39E+01
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	6.93E+00	3.88E-02	1.48E+00	0.00E+00	7.61E-03	3.78E-02	2.26E-02	5.38E-01	-8.87E-01
Acronyms	PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy, PENRE: Use of non-renewable primary energy excluding 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, SM: Secondary material, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, FW: Net use of fresh water.									

Environmental information describing waste categories (Mandatory)										
Impact Category	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
HWD	kg	5.47E-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
NHWD	kg	1.10E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E+03	0.00E+00
RWD	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
Environmental information describing Output flow (Mandatory)										
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.51E+02	0.00E+00	0.00E+00
MER	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
EE (Electrical)	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
EE (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
Acronyms	HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy thermal.									
***Disclamer 1**	The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
****Disclamer 2**	GWP-GHG = Global Warming Potential total excl. biogenic carbon following IPCC AR5 methodology. The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. The GWP-GHG indicator is identical to GWP-total except that the characterisation factor (CF) for biogenic CO_2 is set to zero.									
*****Disclamer 3**	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.									

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