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Environmental Product Declaration

EN ISO 14025:2010

EN 15804:2012+A2:2019

EN 15804:2012+A2:2019/AC:2021

Aluminium Conductor 1010 - AL1

UNE EN 50182

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Cunext GROUP

CUNEXT GROUP ECN

The holder of this Declaration is responsible for its content, as well as for keeping the supporting documentation that justifies the data and statements included during the period of validity

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AENOR is a founding member of ECO Platform, the European Association of Environmental Product Declaration Verification Programmes

European Standard EN 15804:2012+A2:2019 serves as the basis for the PCR (Product Category Rules)

Independent verification of the declaration and data in accordance with EN ISO 14025:2010

☐ Internal ☒External

Verification body

AENOR

Product certification body accredited by ENAC with accreditation No. 1/C-PR468.

1. General information

1.1. The organisation

Cunext Group is a leader in the transformation of copper and aluminium of the highest quality, with sustainability, continuous innovation and the development of products that bring greater value to the market at the core of its operations.

Its facilities are located in Spain, in the provinces of Córdoba, Madrid, Barcelona, Zaragoza and Vitoria. It also has an international presence in Italy and the United States.

The copper and aluminium products manufactured by the Cunext Group are always at the top of the quality range, with the company positioning itself as a leading supplier in its sector in Southern Europe and North Africa, being a leading supplier of contact wire, wire and drawn products, ropes and extruded products.

The Cunext Group's facilities have various certifications that endorse the commitment to sustainability adopted in the management of all its processes:

- UNE-EN-ISO 9001:2015. Registration No. ER-0128/1994
- UNE-EN-ISO 14001:2015. Registration No. CA-1998/0084
- European Regulation 1221/2009 (EMAS), Registration No. E-AN-0000006
- UNE-EN-ISO 45001:2018. Registration No. SST-0129/2006
- UNE-EN-ISO 50001:2018. Registration No. GE-2022/0064

1.2. Scope of the Declaration

This environmental product declaration provides environmental information relating to the life cycle of the Cowslip-type aluminium conductor, designated 1010-AL1 in accordance with standard EN 50182, manufactured at the ECN plant in Vitoria within the Spanish geographical and technological context during the year 2024

1.3. Life cycle and compliance.

This EPD has been developed and verified in accordance with the EN ISO 14025:2010 and EN 15804:2012 +A2:2019/AC:2021 standards, according to the following Product Category Rule:

Table 1. Product Category Rule

Information on Product Category Rules	
Descriptive title	Sustainability in construction. Environmental product declarations Basic product category rules for construction products
Registration code and version	EN 15804:2012+A2:2019/AC:2021
Issue date	2021
Programme Manager	AENOR

This Environmental Declaration includes the following life cycle stages:

Table 2. Information modules considered

Product stage	A1	Supply of raw materials	X
	A2	Transport to the factory	X
	A3	Manufacture	X
Construction	A4	Transport to construction site	X
	A5	Installation / construction	X
Use stage	B1	Use	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	In-service energy use	X
	B7	In-service water use	ND
End of life	C1	Deconstruction / demolition	X
	C2	Transport	X
	C3	Waste treatment	X
	C4	Disposal	X
	D	Potential for reuse, recovery and/or recycling	X
X = Module included in the LCA; NR = Module not relevant; ND = Module not declared			

This EPD may not be comparable with those developed in other Programmes or according to different reference documents, in particular it may not be comparable with EPDs not developed according to UNE-EN 15804:2012+A2:2020.

Similarly, these EPDs may not be comparable if the origin of the data is different (e.g. databases), or not all relevant information modules are included, or they are not based on the same scenarios

The comparison of construction products must be made on the same function, applying the same functional unit and at the level of the building (or architectural or engineering work), i.e. including the behaviour of the product throughout its life cycle, as well as the specifications of section 6.7.2 of UNE-EN ISO 14025.

2. The product

2.1. Identification of the product

Steel-reinforced aluminium conductors are widely used in high-voltage overhead lines for the transmission and distribution of electricity.

The steel core provides high mechanical strength, enabling the cable to support its own weight over long spans, as well as loads caused by wind, ice and thermal stresses.

The outer aluminium layer provides high electrical conductivity, which helps to minimise energy losses due to the Joule effect. Furthermore, aluminium's low density means that long spans can be covered with fewer supports, reducing the number of supports required.

Their combination of electrical and mechanical properties, together with their relatively low cost and high reliability, makes them essential components in electricity grids around the world.

The classification of the product according to the United Nations Central Product Classification (CPC) is as follows:

CPC code: 42942.

2.2. Features of the product

The aluminium strands used in the conductors are manufactured from Standard A aluminium contact wire produced by ECN, which contains 18.5% recycled secondary material. The steel wires, coated with aluminium for protection, are known as Araweld (AW).

The characteristics of the conductors manufactured comply with the UNE EN 50182 standard.

The manufacturer declares the following information on the technical specifications of the product:

Table 3. Product characteristics

Characteristic		Unit	Value
Section	Aluminium	mm²	1010.4
	Steel	mm²	
	Total	mm²	1010.4
Strands	Aluminium	No.	91
	Steel	No.	
Wire diameter	Aluminium	mm	3.76
	Steel	mm	
Diameter	Core	mm	
	Total	mm	41.36
Weight		kg/km	2..807,1
Breaking load		kN	161.7
Electrical resistance	CC@20°C	Ω/km	0.0287

2.3. Product composition

The composition by weight stated by the manufacturer is as follows:

Table 4. Product composition

Substance	Contents	Unit
Aluminium wire	100	%

The cables are supplied on wooden reels, wrapped in polyethylene film. The following table shows the average amount of packaging material used per kilometre of conductor:

Table 5. Packaging material per kilometre of conductor

Packaging material	Contents	Unit
Wood	216.15	kg
Paper and cardboard	2.95	kg
Low-density polyethylene	0.32	kg

No substances listed in the Candidate List of Substances of Very High Concern (SVHC) for authorisation, or subject to other regulations, have been used in the manufacture.

3. Information on the LCA

3.1. Life cycle assessment

The Life Cycle Assessment Report that supports this EPD was produced by Sinergy, based on specific data provided by the Cunext Group regarding the manufacturing process for steel-reinforced aluminium conductors at the ECN plant in Vitoria, relating to the year 2024.

The generic data source was the SimaPro 10.2 software together with the Ecoinvent 3.11 database.

The LCA life cycle assessment has a cradle-to-gate scope with options, including modules A1-A3, A4, A5, B6, C1 to C4 and D.

3.2. Functional unit

For the purposes of this study, the following is taken as the functional unit: “Transmitting energy equivalent to 1A over a distance of 1 km for 40 years, with a 100% utilisation rate”

The environmental impacts of the different stages of the life cycle are not proportional to the same input parameters:

- The manufacturing, distribution and end-of-life stages are proportional to the length of the cable under consideration (1 km).
- The use stage is proportional to the length of the cable under consideration (1 km) and to the current carried. To facilitate comparison, the impact of the use stage is calculated for 1 A

3.3. Reference service life (RSL)

The definition of the functional unit has taken into account the provisions of standard PSR-001-ed4-EN-2022 11 16, using the service life and utilisation rate specified in its Annex 1 for electricity distribution network infrastructure: a service life of 40 years and a utilisation rate of 100%.

3.4. Allocation criteria

Where possible, allocation has been avoided. For processes shared with the production of other product types, where it has not been possible to avoid allocation, allocation rules based on product mass have been applied to the consumption of electricity, fuels, auxiliary materials and water, as well as to discharges, emissions and waste disposal.

Environmental impacts have been calculated on a per-unit-of-mass basis. To express the impacts on based on the functional unit, the environmental impacts have been multiplied by the weight of 1 km of conductor.

3.5. Cut-off criteria

In the quantification of material and energy flows, cut-off criteria in accordance with EN 15804 +A2 have been used. Thus, matter flows of less than 1% of the cumulative mass of inputs and outputs can be excluded, unless their environmental relevance is significant. Similarly, energy flows of less than 1% of the cumulative energy inputs and outputs can be excluded, unless their environmental relevance is significant.

The following have been excluded: repair, maintenance, replacement and refurbishment work; the use of water in service; equipment production and maintenance; and employee travel.

In any case, the sum of the excluded flows does not exceed 5% of the mass, energy or overall environmental impact. The cut-off criterion has not been applied to omit available data with relevant impact.

3.6. Representativeness, quality and selection of data

The data used for the LCA are representative of the production technologies for the steel-reinforced aluminium conductor at the ECN plant in Vitoria where it is manufactured, as well as of the technologies and processes involved in the various life cycle stages analysed.

The specific production data for the conductor at the ECN plant in Vitoria covers the whole of 2024.

The generic data source was the SimaPro 10.2 software together with the Ecoinvent 3.11 database. Generic data are representative of a period within the last 10 years.

To characterise the potential environmental impacts throughout the life cycle analysed, the EN 15804 +A2 impact assessment method was applied, which uses the characterisation factors from the Environmental Footprint 3.1 method. The Cumulative Energy Demand LHV 1.01 method has also been used for the energy-related environmental indicators (PERT, PERNT), and the Selected LCI Results 1.08 method for the water use indicator (FW). The "Cut-off" criterion has been applied for Ecoinvent processes.

The geographical scope of the data is representative of the operational reality of the vast majority of processes across the various stages of the life cycle analysed, bearing in mind that the raw materials are sourced both internationally (steel) and domestically. Production takes place in Spain, and the assembly, use and end-of-life of the product occur within Spain. However, in some end-of-life processes, generic data at European or global level has been used.

For the development of this study, the data quality requirements established by the UNE-EN 15804:2012+A2:2020 standard have been taken into account and are summarised in the following table. The assessment of data quality was carried out in accordance with the criteria set out in Table E.1 of Annex E to the aforementioned standard.

Table 6. Data quality

Criteria	Description
Integrity	All relevant processes in the conductor production value chain have been used, representing the specific situation of each of them.
Consistency	To ensure consistency, data at the same level of detail and developed under the same methodological considerations have been used.
Reproducibility	The methods and data used have been described in such a way that they can be reproduced by an independent professional.
	Representativeness
Geographical coverage	The geographical scope of the data is representative of the operational reality of the vast majority of processes across the various phases of the life cycle analysed.
Temporal coverage	The specific production data for the conductor at Cunext Copper Industries' Vitoria plant covers the whole of 2024. The SimaPro software has been used as a source of generic data 10.2 in conjunction with the Ecoinvent database 3.11. Generic data are representative of a period within the last 10 years.
Technological coverage	The data reflects the conductor production technologies used at the Cunext Copper Industries plant in Vitoria, where the product is manufactured. The Ecoinvent 3.11 database has been used to model the representative processes of the components not manufactured at Cunext.

Following the data quality criteria of the product category rules of the environmental footprint, and considering that the processes are representative of the declared geographical area, that the technological aspects are very similar with no need to modify technical aspects significantly and that the data are less than 3 years old, the level of data quality is considered to be good.

3.7. Other calculation rules and assumptions

The following outlines the main considerations and assumptions made, as well as the most relevant calculations carried out for the purposes of this study:

- The GWP of the electricity mix applied specifically for A1-A3 is 0.26 kg CO2e/kWh. In order to determine the impacts associated with electricity consumption in the manufacturing stage, the residual energy mix of the supplier has been modelled, without the use of GDO.
- To calculate the impact of the use stage, a high-voltage electricity mix for Spain from the Ecoinvent 3.11 database is used, given that sales are nationwide.
- No fuels or other sources of direct GHG emissions are used in the conductor manufacturing process.
- For all transport operations to and from the various production sites, 16–32-tonne lorries meeting the EURO 6 emissions standard have been specified.
- The exact distance from the Araweld steel supplier is taken into account, whilst for all other auxiliary materials a distance of 1,000 km is assumed.
- The data on the environmental impacts of the production of Standard A aluminium contact wire, which is used as a raw material, are taken from the Environmental Product Declaration (EPD) for this type of contact wire, manufactured at ECN's facilities in Vitoria, verified under the Global scheme and valid from 2023 to 2028 (GlobalEPD EN15804-043).
- The cooling water for the process comes from tanks on site that collect rainwater. This water operates in a closed-loop system, being recirculated back into the tanks. Only mains water is used for sanitary purposes, which is discharged into the municipal sewer system. The rainfall data is based on an estimate derived from meteorological data (Abetxuko station) and the surface area, which is used to calculate the annual rainfall in litres per square metre for the reference year 2024.
- For the installation stage, losses of 3% have been factored in, as is typical for the installation of high-voltage power lines.
- For end-of-life stages, distances of 150 km to the treatment facility have been taken into account, along with a 5% loss in the recycling treatment process.

4. System limits, scenarios and additional technical information.

4.1. Pre-manufacturing processes.

Module A1 covers the extraction and processing of raw materials, the processing of secondary materials, and the manufacturing processes involved in producing ECN's Standard A contact wire and the steel wires used in the manufacture of aluminium-steel conductors.

Bauxite is the mineral from which aluminium is primarily extracted. After extraction, the bauxite is processed and undergoes leaching, precipitation and calcination processes to obtain alumina. Alumina is subjected to electrolysis, refining and casting processes for the production of aluminium ingots. These ingots are processed at ECN's facilities to produce Standard A contact wire, incorporating recycled secondary material.

Along with aluminium, steel is the other component of the conductor. Module A1 covers the extraction and processing of raw materials and secondary materials for steel production, as well as the transformation processes required to produce the steel wire used at ECN's facilities for forming the aluminium-steel conductor.

Module A1 also covers the generation of imported electricity and self-generated electricity, which are consumed in the product's manufacturing processes.

Module A2 covers the processes involved in transporting materials from the production plant to the ECN facilities where the conductor is manufactured. The exact distance from the steel supplier is taken into account, whilst for all other auxiliary materials a distance of 1,000 km is assumed.

4.2. Manufacture of the product.

Module A3 covers the manufacturing processes for steel-reinforced aluminium conductors at the ECN site. ECN's aluminium contact wire undergoes a wire-drawing process, which involves cold working to reduce the diameter of the contact wire without producing any swarf. This is achieved by applying significant mechanical tensile forces, which force the contact wire, with the aid of a liquid lubricant, through a die known as a drawing die, which has a conical inlet and an internally drilled hole. The data on the environmental impacts of the production of Standard A aluminium contact wire, which is used as a raw material, are taken from the Environmental Product Declaration (EPD) for this type of contact wire, manufactured at ECN's facilities in Vitoria, verified under the Global scheme and valid from 2023 to 2028 (GlobalEPD EN15804-043).

The wire drawing process focuses on the roughing section, where aluminium wires with a diameter of up to 1.35 mm and aluminium alloy wires with a diameter of up to 2.00 mm are produced.

Once the aluminium wire produced in the previous process has been obtained, the cabling is carried out, which involves bundling wires of different diameters to produce cables with the cross-sections and configurations required for each type of conductor. Steel wires required for the specific type of cable are also used in this process.

4.3. Construction stage

Module A4 includes the transport of conductors to the delivery point. An average road transport distance of 1,000 km has been considered, using a 16–32-tonne lorry meeting EURO 6 emission standards.

Module A5 considers the installation processes required for laying the conductor on the overhead power line, taking into account the typical energy consumption rates associated with the cable-installation phase on overhead lines—using crane lorries and machinery—as well as the transport and management of the waste generated.

This phase will also consider the end-of-life treatment of packaging, taking into account the following scenarios (based on Royal Decree 1055/2022 on packaging and packaging waste):

Table 7. End-of-life scenario for packaging materials

Packaging material	Recycled	Landfill	Incineration
Plastic	50%	40%	10%
Paper	75%	20%	5%
Wood	25%	60%	15%

The construction stage also considers transport, production and waste management, as well as the material losses typical of the installation stage of high-voltage overhead power lines, which amount to 3%.

4.4. Use stage

During the use stage, the B6 module is calculated, taking into account the electrical energy losses due to the Joule effect over the period of use, based on the resistance R and the service life RSL of each cable.

Electrical losses E during the use stage have been calculated using the formula set out in standard PSR-001-ed4-EN-2022 11 16:

$$\mathbf{E[J/kmA^2] = R[\Omega/km\text{-}1] \times I^2[A^2] \times \Delta t\ [s]}$$

Annex 1 of standard PSR-001-ed3-EN-2015 10 16 specifies a service life of 40 years and a utilisation ratio of 100% for cables in the electricity distribution network.

Table 8. Energy lost over the service life

Parameter	Value	Unit
Resistance	0.0287	Ω/km
Service Life	40	Years
Utilisation rate	100	%
Duration of use	1,261,440,000	s
Energy loss E	36,266,185	J/km/A

4.5. End-of-life stage

For modules C1-C4: the following assumptions and scenarios have been considered.

- C1: The disassembly of the conductor has been modelled using a process similar to, but the reverse of, the installation process (Life-cycle assessment of 11 kV overhead power lines and underground cables. Craig I. Jones, Marcelle C. McManus).
- C2: a transport distance from the disassembly site to the treatment or disposal plant of 150km has been considered.
- C3: crushing process for subsequent recycling. It has been assumed that the conductor is disassembled separately and without mixing; consequently, it has been considered that virtually all of it is processed at the plant, with the exception of 5% due to possible losses. A metal recycling rate of 95% has been considered, with a 5% loss during processing.
- C4: final disposal of the remaining 5% of the material in an inert landfill has been considered.

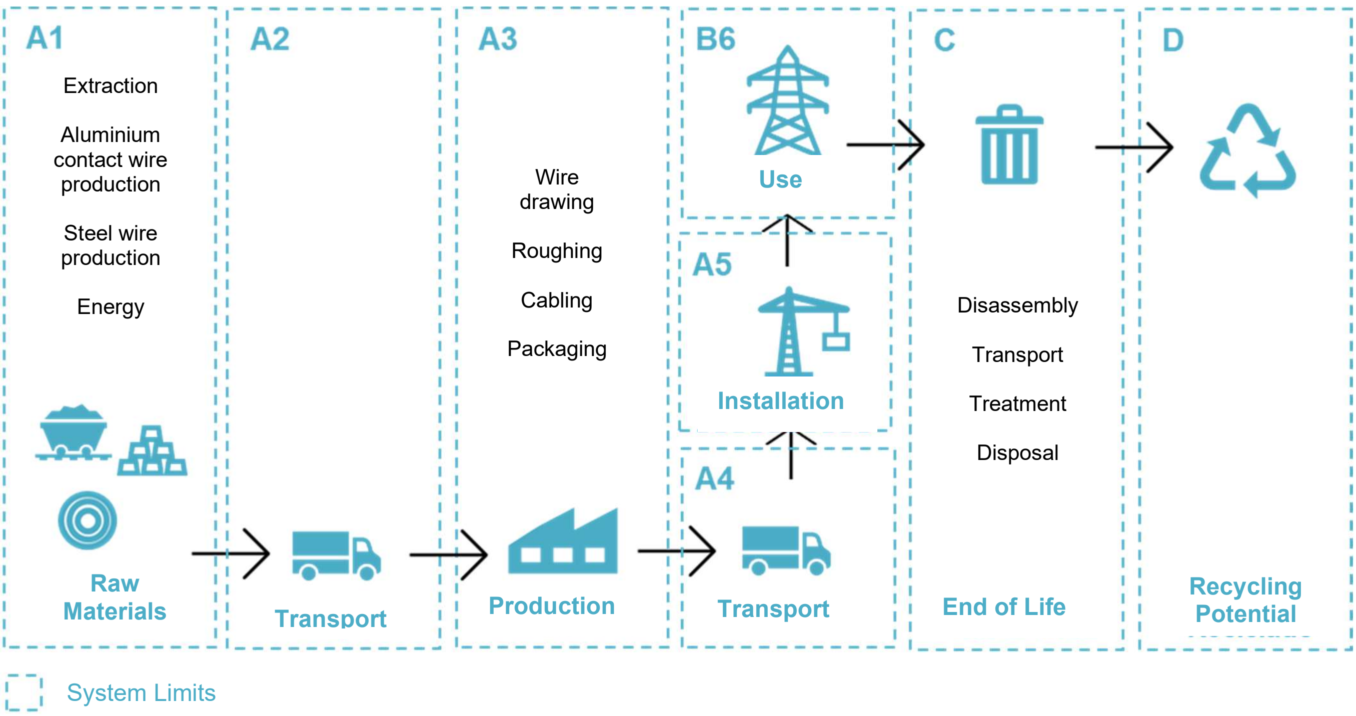
Table 9. Product end-of-life scenario

End-of-Life Scenario	%	Performance
Disassembly	100%	
Recycling process	95%	95%
Landfill	5%	

4.6. Benefits and burdens beyond the system

Module D: the net impacts related to the recycling potential beyond the system limits have been calculated as the impacts associated with the virgin material that the recycled material replaces, taking into account the avoided impacts of the input and output secondary materials.

In the case of power lines, the cable is removed separately from other materials during disassembly and is not contaminated by other substances, meaning it can be recycled in its entirety. The material being replaced has been modelled as pig iron production for steel (reference year 2024) and aluminium production (module A1 in GlobalEPD EN15804-043 Aluminium Contact Wire EN AW-1370 Standard A).



5. Declaration of environmental parameters of the LCA and LCI

Environmental impacts.

The estimated impact results are relative and do not indicate the final value of the impact categories, nor do they refer to threshold values, safety margins or risks.

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	2.11E+04	4.63E+01	-2.55E+02	**2.09E+04**	2.95E+02	1.15E+03	1.99E+00	1.10E+02	9.93E+01	3.21E+02	8.29E-01	-1.04E+04
GWP-fossil	kg CO2 eq	2.11E+04	4.63E+01	9.51E+01	**2.12E+04**	2.94E+02	7.55E+02	1.94E+00	1.10E+02	9.92E+01	3.18E+02	8.26E-01	-1.04E+04
GWP-biogenic	kg CO2 eq	6.64E+01	3.22E-02	-3.51E+02	**-2.85E+02**	1.86E-01	3.90E+02	1.84E-02	2.22E-02	4.55E-02	3.04E+00	2.12E-03	-3.37E+01
GWP-luluc	kg CO2 eq	5.47E+00	1.56E-02	4.68E-01	**5.95E+00**	1.10E-01	1.99E-01	2.72E-02	1.12E-02	3.10E-02	6.75E-01	1.32E-04	-2.03E+00
ODP	kg CFC11 eq	4.21E-06	1.01E-06	1.85E-06	**7.08E-06**	6.68E-06	1.97E-06	3.05E-08	1.63E-06	2.18E-06	1.81E-06	3.08E-08	-8.61E-08
AP	mol H+ eq	7.97E+01	9.93E-02	5.43E-01	**8.04E+01**	7.15E-01	3.46E+00	7.90E-03	9.82E-01	2.01E-01	1.55E+00	5.15E-03	-4.09E+01
EP-freshwater	kg P eq	1.95E-02	3.44E-04	3.56E-03	**2.35E-02**	2.31E-03	1.34E-03	3.02E-05	3.84E-04	7.19E-04	1.69E-02	4.66E-06	-5.21E-03
EP-marine	kg N eq	1.23E+01	2.34E-02	2.34E-01	**1.25E+01**	1.84E-01	8.59E-01	1.67E-03	4.56E-01	4.64E-02	2.83E-01	2.19E-03	-5.74E+00
EP-terrestrial	mol N eq	1.34E+02	2.58E-01	2.29E+00	**1.36E+02**	2.04E+00	9.36E+00	1.87E-02	5.00E+00	5.14E-01	3.12E+00	2.41E-02	-6.25E+01
POCP	kg NMVOC eq	3.78E+01	1.58E-01	9.17E-01	**3.89E+01**	1.20E+00	2.74E+00	6.83E-03	1.50E+00	3.23E-01	9.24E-01	9.71E-03	-1.78E+01
ADP – Minerals & Metals 2	kg Sb eq	6.90E-03	1.59E-04	2.46E-04	**7.30E-03**	8.57E-04	3.03E-04	2.95E-06	3.92E-05	3.39E-04	9.40E-06	1.04E-06	-2.91E-03
ADP-fossil 2	MJ	3.09E+05	5.24E+01	2.53E+02	**3.09E+05**	3.53E+02	9.36E+03	4.25E+01	5.57E+01	1.08E+02	2.92E+03	7.92E-01	-1.49E+05
WDP 2	m3 worl eq depriv	1.15E+03	2.58E+00	1.15E+01	**1.16E+03**	2.03E+01	3.80E+01	2.03E+00	3.05E+00	4.97E+00	4.19E+01	7.12E-02	-4.58E+02

GWP - total: Global warming potential; **GWP - fossil**: Global warming potential of fossil fuels; **GWP - biogenic**: Biogenic global warming potential; **GWP - luluc**: Global warming potential of land use and land use change; **ODP**: Stratospheric ozone depletion potential; **AP**: Acidification potential, cumulative surplus; **EP-freshwater**: Eutrophication potential, fraction of nutrients reaching the final freshwater compartment; **EP-marine**: Eutrophication potential, fraction of nutrients reaching the final marine water compartment; **EP-terrestrial**: Eutrophication potential, cumulative surplus; **POCP**: Tropospheric ozone formation potential; **ADP- minerals&metals** Abiotic resource depletion potential for non-fossil resources; **APD-fossil**: Abiotic resource depletion potential for fossil resources; **WDP**: Water deprivation potential (user), weighted water deprivation consumption. **NR**: Not relevant

Additional environmental impacts

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PM	Incidence of diseases	1.23E-03	3.45E-06	1.68E-05	**1.26E-03**	2.91E-05	6.70E-05	3.88E-08	2.80E-05	6.22E-06	1.40E-05	1.30E-07	-6.59E-04
IRP 1	kBq U235 eq	6.39E+03	2.87E-01	2.30E+00	**6.39E+03**	1.84E+00	1.92E+02	8.07E-01	2.38E-01	7.17E-01	1.72E+01	6.65E-03	-3.50E+03
ETP-fw 2	CTUe	1.09E+05	8.83E+01	4.82E+02	**1.09E+05**	5.23E+02	3.39E+03	2.18E+00	7.76E+01	2.03E+02	6.41E+02	2.10E+00	-5.73E+04
HTP-c 2	CTUh	5.31E-06	7.73E-09	3.98E-08	**5.36E-06**	4.86E-08	1.75E-07	4.00E-10	1.12E-08	1.53E-08	2.65E-08	3.47E-09	-2.81E-06
HTP-nc 2	CTUh	1.46E-04	4.13E-07	8.61E-07	**1.48E-04**	2.86E-06	4.82E-06	8.00E-09	1.76E-07	8.12E-07	1.51E-06	3.03E-09	-7.47E-05
SQP 2	-	1.90E+04	3.95E+02	3.66E+04	**5.60E+04**	4.49E+03	1.87E+03	8.29E+00	9.49E+01	7.14E+02	3.83E+02	4.17E+01	-4.14E+03

PM: Potential incidence of diseases due to particulate matter (PM) emissions; **IRP**: Exposure efficiency of the human potential relative to U235; **ETP-fw**: Comparative ecosystem toxic unit potential - freshwater; **HTP-c:** Comparative ecosystem toxic unit potential - carcinogenic effects; **HTP-nc:** Comparative ecosystem toxic unit potential - non-carcinogenic effects; **SQP:** Soil quality potential index; **NR**: Not relevant

Notice 1: This impact category deals mainly with the potential impacts of low doses of ionising radiation on human health from the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents and occupational exposure due to the disposal of radioactive waste in underground facilities. The ionising radiation potential of soil, due to radon or some building materials, is also not measured with this parameter.

Notice 2: The results of this environmental impact indicator should be used with caution, as the uncertainties of the results are high and experience with this parameter is limited.

Use of resources

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PERE	MJ	1.36E+05	1.09E+01	1.26E+03	**1.37E+05**	-5.66E+03	2.63E+03	1.96E+01	9.01E+00	2.56E+01	5.55E+02	4.21E-01	-7.31E+04
PERM	MJ	1.16E+00	0.00E+00	5.98E+03	**5.98E+03**	5.56E+03	5.74E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.36E+05	1.09E+01	7.23E+03	**1.43E+05**	6.91E+01	4.30E+03	1.96E+01	9.01E+00	2.56E+01	5.55E+02	4.21E-01	-7.31E+04
PENRE	MJ	2.66E+05	5.24E+01	6.34E+01	**2.66E+05**	3.32E+02	-2.91E+04	4.25E+01	5.57E+01	1.08E+02	2.92E+03	7.92E-01	-1.49E+05
PENRM	MJ	4.27E+04	0.00E+00	1.90E+02	**4.29E+04**	3.07E+01	4.53E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	3.09E+05	5.24E+01	2.53E+02	**3.09E+05**	3.53E+02	9.37E+03	4.25E+01	5.57E+01	1.08E+02	2.92E+03	7.92E-01	-1.49E+05
SM	kg	6.54E+02	0.00E+00	0.00E+00	**6.54E+02**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.67E+03
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	2.33E+02	8.26E-02	4.15E-01	**2.33E+02**	6.17E-01	6.53E+00	2.90E-02	1.00E-01	1.69E-01	1.79E+00	2.35E-02	-1.27E+02

PERE: Renewable primary energy use excluding renewable primary energy resources used as raw materials; **PERM**: Use of renewable primary energy used as raw materials; **PERT**: Total use of renewable primary energy; **PENRE**: Non-renewable primary energy use, excluding non-renewable primary energy resources used as raw materials; **PENRM**: Use of non-renewable primary energy used as raw materials; **PENRT**: Total use of non-renewable primary energy; **SM**: Use of secondary materials; **RSF:** Use of renewable secondary fuels; **NRSF**: Use of non-renewable secondary fuels; **FW**: Net use of flowing water resources; **NR**: Not relevant

Waste categories

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
HWD	kg	8.56E-02	1.68E-02	6.90E+00	**7.00E+00**	1.27E-01	5.79E-01	9.87E-04	1.34E-02	3.26E-02	1.45E-01	2.95E-04	-9.58E-05
NHWD	kg	5.70E+03	3.20E+01	7.87E+01	**5.81E+03**	3.85E+02	3.15E+02	1.16E-01	9.65E-01	5.67E+01	1.99E+00	1.40E+02	-3.14E+03
RWD	kg	3.19E+01	1.96E-04	1.82E-03	**3.19E+01**	1.23E-03	9.58E-01	5.51E-04	1.50E-04	5.06E-04	1.11E-02	4.15E-06	-1.72E+01

HWD: Hazardous waste disposed of; **NHWD**: Non-hazardous waste disposed of; **RWD**: Radioactive waste disposed of; **NR**: Not relevant

Outflows

Parameter	Units	A1	A2	A3	A1-A3	A4	A5	B6	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	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	7.52E+02	**7.52E+02**	0.00E+00	1.38E+02	0.00E+00	0.00E+00	0.00E+00	2.53E+03	0.00E+00	2.53E+03
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	0.00E+00	0.00E+00	0.00E+00
EE	MJ	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU: Components for re-use; **MFR**: Materials for recycling; **MER**: Materials for energy recovery; **EE**: Energy exported; **NR**: Not relevant

Information on biogenic carbon content

Biogenic carbon content	Units	Earnings per declared functional unit
Product biogenic carbon content — KgC	kg C	0.00E+00
Biogenic carbon content packaging — KgC	kg C	8.98E+01

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