

Environmental Product Declaration

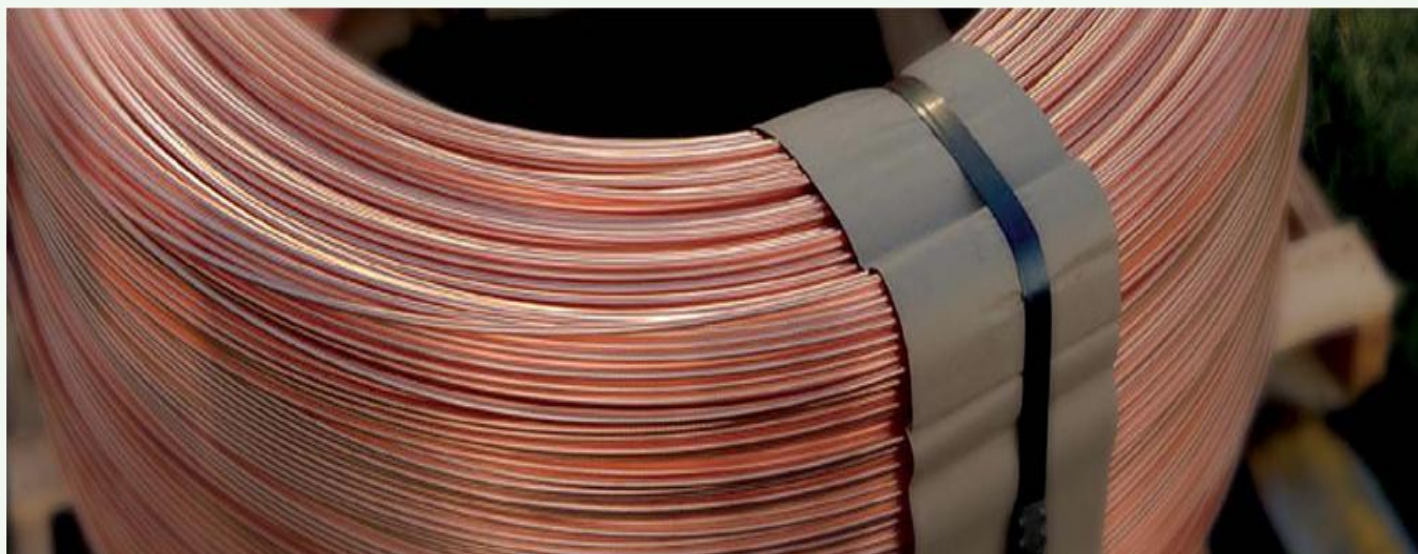


In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Wire Cu-OFE

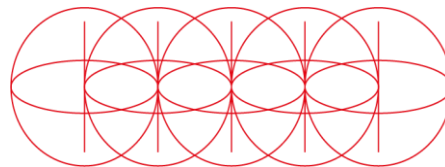
from

KGHM Polska Miedź S.A.



Programme:	SRC EPD program v.1.0
Programme operator:	Silk Road Certification Sp. z o.o.
EPD registration number:	SRC/2026/06/30/EPD/02
Version date:	15.06.2026
Validity date:	29.06.2029

An EPD should provide current information and may be updated if conditions change.



GENERAL INFORMATION

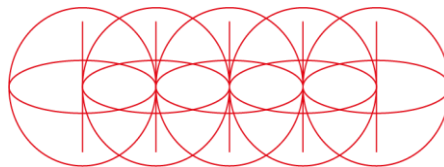
Programme information

Programme:	SRC EPD program v.1.0
Address:	ul. Lubliniecka 17 44-102 Gliwice Poland
Website:	www.osrc.org.pl
E-mail:	epd@src.org.pl

Accountabilities for PCR, LCA and independent, third-party verification
In accordance with the requirements of:
<i>En 15804:2012+A2:2019</i>
Life Cycle Assessment (LCA)
LCA accountability: <i>Mineral and Energy Economy Research Institute, Polish Academy of Sciences (MEERI PAS), Strategic Research Division, 31-261 Krakow, Wybickiego 7a contact: kulczycka@meeri.pl</i>
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: SILK ROAD CERTIFICATION SP. Z O.O. Registered and correspondence address: Lubliniecka 17 44-102 Gliwice Poland Office: Toszecka 99 44-100 Gliwice Poland Office 438 3rd floor, EU VAT: PL6312685442, REGON: 383188194
Procedure for follow-up of data during EPD validity involves third party verifier:
☐ Yes ☒ No

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

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.



INFORMATION ABOUT EPD OWNER

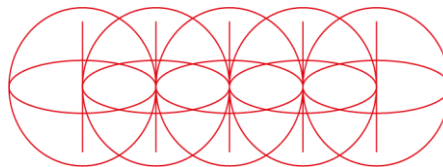
Owner of the EPD: KGHM Polska Miedź S.A.

Address: Huta Miedzi „Cedynia”, Orsk, 59-305 Rudna, Polonia

Contact: Daniel Głowacki [daniel.glowacki@kghm.com]

Description of the organisation: KGHM Polska Miedź S.A. is a global, technologically advanced mining and metallurgy company and one of the leading producers of copper and silver worldwide. The company has been operating for more than 60 years, developing an integrated production model based on its own mineral resources, mines, ore processing facilities and metallurgical plants. The core of KGHM's operations is located in south-western Poland, where one of Europe's largest copper ore deposits is situated. KGHM operates mining and production assets in Europe, North America and South America, and its product portfolio includes copper cathodes, copper wire rod, oxygen-free copper products, silver and other valuable metals.

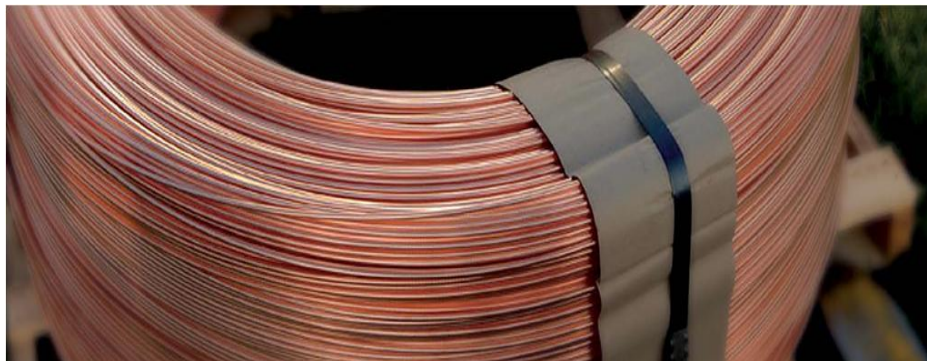
KGHM is the largest producer of mined copper in Europe and remains among the top 10 copper producers globally. According to the World Silver Survey 2026, the company is also the second-largest global silver producer. Copper OFE Wire is manufactured at the Cedynia Wire Rod Plant Division of KGHM Polska Miedź S.A. in Orsk, Poland, where oxygen-free copper wire is produced using UPCAST technology. The Cedynia plant processes electrolytically refined copper cathodes from KGHM's Głogów and Legnica copper smelter/refineries, as well as copper scrap, into high-quality copper wire rod and oxygen-free copper products.



PRODUCT INFORMATION

Product name: Oxygen-Free Copper Rod Cu-OFE

Visual representation (e.g., an image) of the product:



Product description: The Copper OFE Wire is produced by the Cedynia Copper Wire Rod Plant Division of KGHM Polska Miedź S.A., located in Orsk, Poland. The plant produces oxygen-free copper wire using UPCAST technology. The installation was commissioned in 2006, increasing the plant's production capacity by 15,000 tonnes of copper per year.

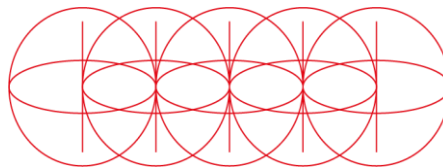
The UPCAST process enables the production of Cu-OFE oxygen-free copper wire in a structurally cast state, with diameters of 8, 12.7, 16, 20, 22, 24 and 25 mm. The process may also be used for the production of oxygen-free, silver-bearing copper wire. The production line includes a cathode charging system, melting and casting furnaces, a vertical casting machine with crystallizers and primary and secondary cooling systems, as well as coiling machines. The wire is produced from selected Cu-CATH-1 copper cathodes supplied under KGHM brands HML, HMG-B and HMG-S.

Name and location of production site(s): Huta Miedzi „Cedynia”, Orsk, 59-305 Rudna, Polonia

CONTENT DECLARATION

- The mass (weight) of one unit of a product, as purchased or per declared unit: 1kg of manufactured Copper OFE Wire
- Content of the product in the form of a list of materials and substances, and their mass: The product consists of Cu-OFE oxygen-free copper. For the declared unit of 1 kg of Copper OFE Wire, the product content is 1.00 kg of copper. The content of impurities is max. 25 ppm and the oxygen content is max. 3 ppm. The product does not contain biogenic carbon.
- The declared share of biogenic/recycled materials: The product does not contain biogenic material. The declared share of biogenic material in the product is 0%. The product is manufactured from copper cathodes.

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Copper cathode	1.00	18,2 %	0	0
TOTAL	1.00	18,2 %	0	0



Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Wooden pallets	44.130	1.10	50% - 22.065 kg C/kg*
Foil hood	0.232	< 0.01	0% - 0 kg C/kg
Stretch foil	0.279	< 0.01	0% - 0 kg C/kg
Label	0.002	< 0.01	0% - 0 kg C/kg
Steel tapes	2.589	0.06	0% - 0 kg C/kg
Branorost paper (pallet pad)	0.312	< 0.01	40% - 0.1248 kg C/kg*
Branorost paper (protection of coils - under plastic packaging)	0.740	0.02	40% - 0.296 kg C/kg*
Cardboard pad for steel tape	0.259	< 0.01	40% - 0.1036 kg C/kg*
TOTAL	48.543	1.21	

LCA INFORMATION

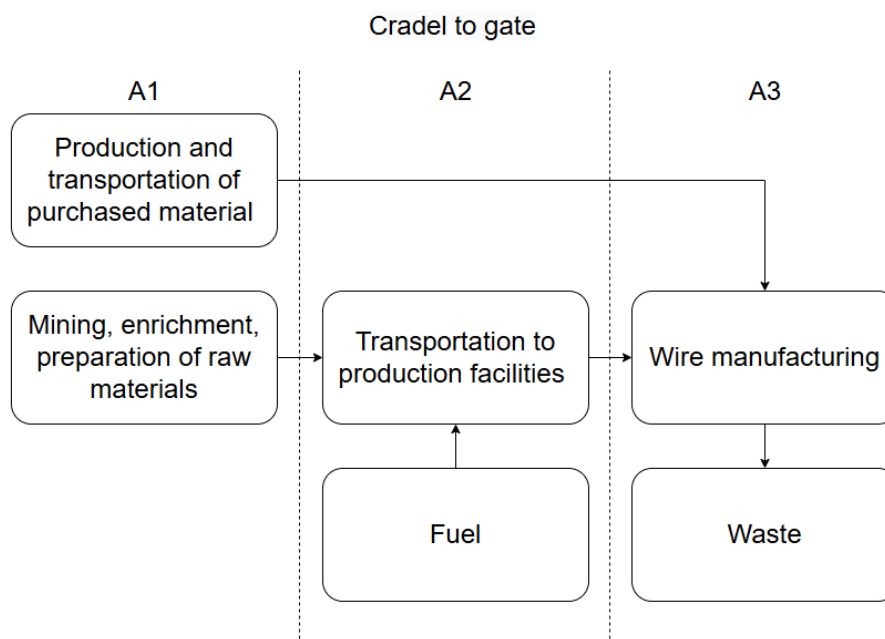
Functional unit: 1kg of manufactured Copper OFE Wire

Time representativeness: 2024 year

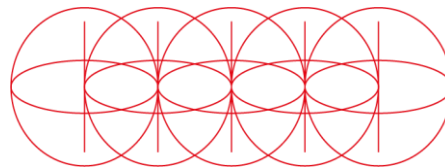
Geographical scope: Lower Silesian Voivodeship

Database(s) and LCA software used: Database: Ecoinvent 3.11 (EN 15804); Software: Simapro 10.3.0.1

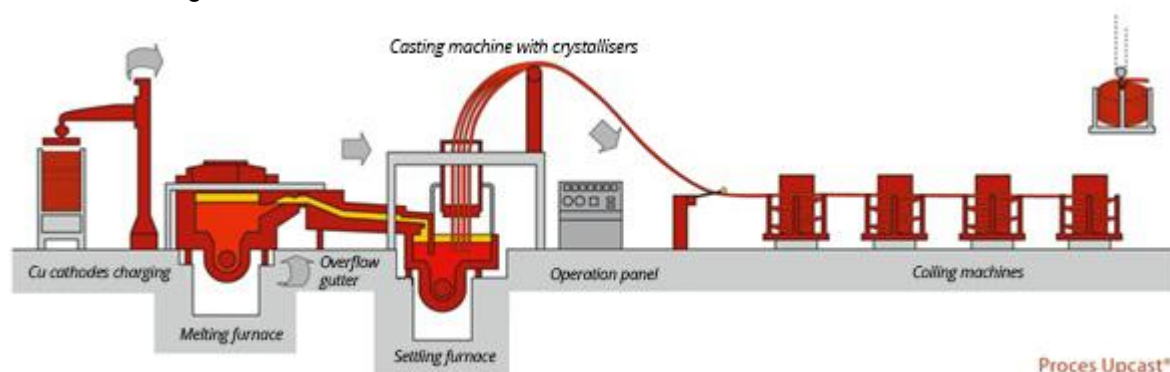
System boundaries: Cradle to gate (A1–A3).



Cradle-to-gate process flow diagram for Copper OFE Wire production, including modules A1–A3.



Process flow diagram:



Schematic representation of the UPGAST process used for the production of Cu-OFE oxygen-free copper wire at the Cedynia Copper Wire Rod Plant Division.

The process flow diagram presents the cradle-to-gate system boundary for the production of Copper OFE Wire manufactured by KGHM Polska Miedź S.A. The declared system includes modules A1–A3, covering raw material supply, transport to the manufacturing site and the manufacturing process at the Cedynia Copper Wire Rod Plant Division in Orsk, Poland.

In module A1, copper ore is extracted from KGHM's mining operations and processed in enrichment plants to produce copper concentrate. The concentrate is then further processed in KGHM's smelting and refining facilities. At the Głogów Copper Smelter and Refinery, copper concentrate is smelted using single-stage flash smelting technology to produce blister copper. At the Legnica Copper Smelter and Refinery, copper cathodes are produced using shaft furnace technology and electrorefining. The output of the smelting and refining stage is high-purity electrolytic copper cathodes.

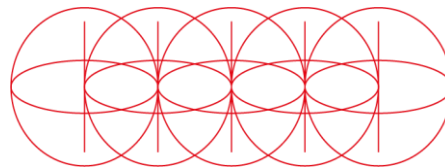
Module A2 includes the transport of copper cathodes and other input materials to the Cedynia Copper Wire Rod Plant Division. Transport-related fuel consumption is included within this module.

Module A3 covers the manufacturing of Copper OFE Wire using the UPGAST continuous casting technology. In this process, selected copper cathodes are charged into the melting furnace, melted and transferred through the casting system. The molten copper is vertically cast through crystallizers and cooling systems to produce oxygen-free copper wire. The product is then coiled and prepared for delivery. The manufacturing stage also includes the consumption of energy and auxiliary materials, as well as the generation and management of production waste and packaging waste.

The final product covered by this EPD is Copper OFE Wire, i.e. oxygen-free copper wire supplied in coils and intended for further industrial processing and applications requiring high electrical conductivity and high copper purity.

LCIA methodology and types of impacts

The analysis uses the Environmental Footprint (EF) method, which is a tool for identifying the environmental impact of a product or organization throughout its life cycle. It covers all relevant information about a product or organization, from raw material extraction to disposal. EF is a method based on life cycle analysis (LCA) to quantify the environmental impacts of products (goods or services) and organizations. The main objective of the information obtained through the PEF and OEF method is to reduce the environmental impact of products, services and organizations, taking into account activities in the supply chain (from raw material extraction, production and use to waste management).



The JRC (Joint Research Center) EU plays a key role in the context of EF. It is responsible for the technical and scientific development of EF methods, defining methodological requirements for conducting EF studies, and for many activities related to the development and provision of data.

Initial assumptions

The Upcast line, which separates out a cathode loading system, a melting furnace, a de-stacking furnace, a casting machine with crystallizers for vertical casting, and coilers, produces oxygen-free copper wire.

Production processes at each of KGHM's three smelters are based on different technologies. HM Legnica produces copper in the form of cathodes using shaft furnace technology and the processing of copper scrap. At HM "Glogow I", shaft furnaces were stopped in 2016 and the world's largest flash furnace and electric furnace installation was put into operation, creating a state-of-the-art smelter copper production line. In HM "Glogow II" copper is smelted based on similar technology, so currently production in both production lines of HM "Glogow" is based on single-dial melting in the flash furnace. HM "Cedynia" is a copper rolling mill, processing electrolytic copper into wire rod using the Contirod method and wire using Upcast technology. These products meet the needs of the most demanding markets. In creating the model for modules A1-A3, the following indicators from the Ecoinvent 3.9 database were used, occurring at all stages of production according to proces diagram and the system's boundary assumptions.

Electricity modelling

Electricity production data were modeled on the basis of data received from KGHM Polska Miedź S.A. on the purchase of electricity, broken down by licensed suppliers (Tauron Sprzedaż Sp. Z o.o., Enea S.A., Energetyka Sp. z o.o., Alpiq SE), Energetyka Sp. z o.o. and KGHM's generation sources (modern gas-steam units in Polkowice and Głogów). Modeling was carried out based on the structure of fuels and other primary energy carriers consumed for electricity generation, as well as emission volumes for individual fuels and other primary energy carriers for the above-mentioned entities. An energy mix was prepared for KGHM Polska Miedź S.A. based on the amount of energy purchased from individual suppliers. The set modeled in this way was used in the analysis. The structure is shown in Table 1.

Tabel 1. Energy mix used in KGHM

Energy supplier	By volume of energy purchased	
	MWh	%
TGE S.A.	1962295.32	78,16
Tauron Sprzedaż Sp. z o.o.	489814.27	19,51
Energetyka Sp. z o.o.	58383.68	2,33
TOTAL	2510493,27	100

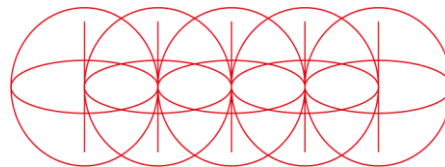
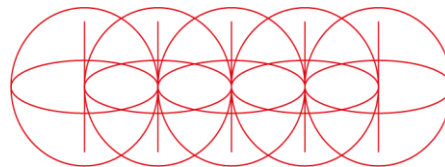


Table 2. Comparison of characterized results of impact category indicators for annual electricity production ("KGHM mix" and Poland's energy mix) per 1kWh.

Damage category	Unit	KGHM medium voltage 2024	Poland – residual electricity mix, high voltage	Poland – electricity production mix, high voltage
Acidification	mol H ⁺ eq	1.46E+00	6.64E+00	6.71E+00
Climate change	kg CO ₂ eq	6.22E+02	1.07E+03	9.58E+02
Ecotoxicity, freshwater	CTUe	2.14E+03	2.19E+03	2.72E+03
Particulate matter	disease inc.	6.19E-06	7.82E-06	7.82E-06
Eutrophication, marine	kg N eq	2.47E-01	7.63E-01	6.49E-01
Eutrophication, freshwater	kg P eq	8.52E-02	4.35E-02	1.18E-01
Eutrophication, terrestrial	mol N eq	2.09E+00	8.41E+00	7.19E+00
Human toxicity, cancer	CTUh	1.00E-07	6.63E-08	1.17E-07
Human toxicity, non-cancer	CTUh	7.31E-06	5.29E-06	9.54E-06
Ionising radiation	kBq U-235 eq	2.50E+00	4.78E+00	1.18E+00
Land use	Pt	2.20E+03	8.94E+02	1.33E+03
Ozone depletion	kg CFC11 eq	6.14E-06	1.07E-05	2.31E-06
Photochemical ozone formation	kg NMVOC eq	8.04E-01	2.43E+00	2.09E+00
Resource use, fossils	MJ	8.79E+03	1.19E+04	1.00E+04
Resource use, minerals and metals	kg Sb eq	1.61E-05	4.23E-06	2.30E-05
Water use	m ³ depriv.	1.09E+02	7.65E+01	8.01E+01



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

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling- potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	x	x	x	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	GLO/ PL	GLO/ PL	PL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Modules/processes/life-cycle stages declared shall be noted with "X".

Modules/processes/life-cycle stages not declared shall be marked as "ND".

Geographical scope shall be reported by the country code(s) (e.g., UK, FR, DE) and/or name of the region(s) (e.g., EU 27, Global).

A variation of 0% shall be reported in EPDs of one product or site.

ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	2.06E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-fossil	kg CO ₂ eq.	2.05E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-biogenic	kg CO ₂ eq.	1.50E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-luluc	kg CO ₂ eq.	9.96E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ODP	kg CFC 11 eq.	5.25E-08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AP	mol H ⁺ eq.	8.73E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-freshwater	kg P eq.	2.16E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-marine	kg N eq.	2.66E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-terrestrial	mol N eq.	2.14E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
POCP	kg NMVOC eq.	7.00E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-minerals&metals*	kg Sb eq.	1.55E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-fossil*	MJ	2.87E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
WDP*	m ³	-9.75E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

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

The EPD shall include a statement, in connection to the results of the impact indicators: "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 following statement, if the EPD covers the end-of-life stage: "The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3)." For services, "A1-A3" shall be replaced by "A1-A5".

If results based on an old EF version is used to develop an EPD, the EPD shall include a statement that clarifies that an EPD based on an old EF version has been used as a data source, and that this was assessed to yield identical or conservative results compared to fully using the current EF version.

If biogenic carbon leaving the product system in module A5 (see Annex 2 of PCR) or recovered energy leaving the product system in modules A5 or C (see Annex 3 of PCR) have been balanced out already in modules A1-A3, a statement in this regard shall be included.

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	2.08E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Resource use indicators

Results per functional or declared unit																
Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	3.71E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PERM	MJ	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PERT	MJ	3.71E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRE	MJ	2.87E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRM	MJ	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRT	MJ	2.87E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SM	kg	5.08E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RSF	MJ	4.10E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NRSF	MJ	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FW	m ³	2.71E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
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															

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Waste indicators

[illegible]