

Hellenic Cables S.A.



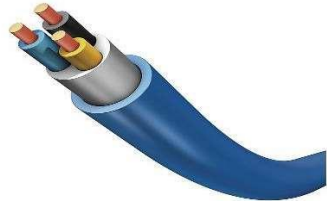
ENVIRONMENTAL PRODUCT DECLARATION

Product: name:

- ARE4*OCE 0.6/1 (1.2) kV 3X95 RM stranded
- ARE4H5EX 12/20 (24) kV 3X185 RM stranded Triplex

Site Plant:

69th km of Old National Road Athens-Thiva, 32200 Thiva, Greece



Program Operator	EPDItaly
Publisher	EPDItaly
Declaration Number	EI0003
Registration Number	EPDITALY0771
Issue date	2024-07-01
Valid to	2026-01-01

General information

EPD OWNER	Hellenic Cables S.A. Amaroussiou-Halandriou 33 str., Athens
SITE	69th km of Old National Road Athens-Thiva, 322 00 Thiva, Greece
FIELD OF APPLICATION OF THE PRODUCT	<p>The present document includes the environmental impact assessment (cradle-to-grave) of:</p> <p>ARE4*OCE 0.6/1 (1.2) kV 3X95 RM stranded</p> <p>ARE4H5EX 12/20 (24) kV 3X185 RM stranded Triplex</p> <p>Geographical scope is global for upstream module and manufacturing is performed in Greece and distribution (downstream) in Italy.</p>
PROGRAM OPERATOR	<p>EPDItaly info@epditaly.it (via Gaetano De Castilia n ° 10 - 20124 Milan, Italy)</p> <p>The PCR EPDITALY007 review was performed by Ing. Massimo De Pieri, Arch. Michele Paleari, Ing. Sara Toniolo. - info@epditaly.it. (via Gaetano De Castilia n ° 10 - 20124 Milan, Italy. Accredited by Accredia</p> <p>Independent verification of the declaration and data, carried out according to</p>
VERIFICATION INFORMATION	<p>ISO 14025: 2010.</p> <p><input type="checkbox"/> Internal <input checked="" type="checkbox"/> External</p> <p>Third party verification carried out by: SGS Italia S.p.A.,0005VV</p>
EPD type	Product specific EPD
CPC CODE	463 – family “Insulated wire and cable; optical fibre cables” and sub-sequent clusters
CONTACTS for information on the EPD	Konstantinos Loukas kloukas@hellenic-cables.com
PROJECT REPORT LCA	Hellenic Cables S.A. (internally performed)
COMPARABILITY STATEMENT	Environmental statements published within the same product category, but from different programs, may not be comparable.
LIABILITY STATEMENT	Hellenic Cables S.A. declares to comply with environmental legislation (ISO 14001 certified). The holder of the declaration will be responsible for the information and supporting evidence.
PRODUCT CATEGORY RULES – PCR	<p>Core-PCR: EPDITALY007 " Electronic and electrical product and systems" Rev. 3 ±3/01/2023</p> <p>Sub-PCR: EPDITALY016 "Electronic and electrical product and systems – Cables and wires" Rev. 2 del 25/09/2020</p> <p>EPDItaly regulation v.6.0</p>
SYSTEM BOUNDARIES	Cradle-to-grave, excluding installation and de-installation stages

With regards to the products covered by the EPD are at the design stage; the future execution of the product in accordance with the design data is the sole responsibility of the EPD Owner. The present EPD follows EPD regulations v.6.0 from the EPDItaly. The database used is regarded as representative on the basis of a comparative study, which examined the data for a reference product of the EPD Owner.

Introduction

Hellenic Cables operates two plants in Viotia, Greece that produce cables and plastic and elastomer compounds Fulgor plant in Corinth, Greece, which manufactures power cables, power and fiber optic submarine cables and copper wires. The company's wide product range extends to PVC, EPR and XLPE insulated power cables (rated up to 500kV), marine and low smoke halogen free cables, fire resistant cables, telecommunication, signal and data cables with copper conductors or optical fibers, as well as fire retardant halogen free plastic and elastomer compounds. Wires and cables are supplied to a variety of international standards. The Company's Quality Management System is certified to ISO 9001:2015, its Environmental Management System to ISO 14001:2015, GHG emissions Management System to ISO 14064:2018 and its Occupational Health and Safety to ISO 45001:2018. The present EPD follows EPD regulations v.6.0 from the EPDItaly.

Goal and scope of the study

The goal of the study is to evaluate the environmental performance of two underground three core power cables; one low voltage and one medium voltage, in order to develop the respective Environmental Product Declaration (EPD) of those products. The scope of the study is to calculate the environmental performance of the production for both cables from cradle to grave, excluding the installation and de-installation stage (as it does not classify as a construction product). The additional/potential benefits at the EoL stage are excluded. Table 1 presents the modules included in the present study.

Table 1 Modules included under cradle to grave

MANUFACTURING STAGE		DISTRIBUTION STAGE	USE STAGE	END-OF-LIFE STAGE
UPSTREAM MODULE	CORE MODULE	DOWNSTREAM MODULE		
Extraction and preparation of raw materials, including waste recycling-pretreatment processes	manufacturing of the product constituents, including relevant processes, energy flows and packaging materials	Transportation via ship and truck to the customer	Electrical losses of the cable during use stage (energy dissipated as heat)	Cable stripping and dismantling, treatment of different components (energy recovery, recycling)
transportation of raw materials to the manufacturing site	product assembly	According to EN 50693		
	packaging			
	waste management processes			

Product Description

The present assessment was performed according to the guidelines of the EPDI Italy Program Operator in accordance with standards (ISO 14040 and 14044) and other reference documents already cited in the introduction (PCR EPDI Italy 016 - Cables and wires). The power cables under assessment are the 1. ARE4*OCE 0.6/1 (1.2) kV 3X95 RM stranded and 2. ARE4H5EX 12/20 (24) kV 3X185 RM stranded Triplex. Both cables are used to transmit and distribute electricity in installed grid systems and do not require further processing (apart from the installation). Electrical and mechanical properties are usually defined by the end customer and the design phase follows the corresponding technical specifications, to meet the use phase conditions

(nominal voltage, power in Amperes etc.). Table 2 and 3 includes the main technical specifications for the first cable design.

Underground cable ARE4*OCE 0.6/1 (1.2) kV 3X95 RM stranded

Table 2 Technical specifications of the cable

General Description	
Standard specification:	GSCC014 REV.0
Type of cable:	ARE4*OCE
Rated voltage U _o /U (U _{max}):	0.6/1 (1.2) kV
Number of cores x Nominal cross-section:	3x95 mm ²
Approximate cable overall diameter:	38.09 mm
Approximate cable overall weight:	2.263 kg/m
Nominal drum length (Tolerance):	500 m (± 1%)

The production includes utilization of primary aluminium ingots, used for the production of the cable conductor (melting primary aluminium to form a solid aluminium rod, which will then undergo a wire drawing process, reducing the rod diameter to the designed cross-section). The conductor will be then electrically insulated with cross-linked polyethylene. Rubber filling will be then added between the poles, followed by an extruded high-density polyethylene jacket.

Table 3 Cable bill of materials according to IEC 62474

Material class	Material category	Raw materials	Units	Amount
Inorganic materials	M-120	Aluminium Conductor	Kg/km	727,1
Organic materials	M-251	Cross-Linked Polyethylene	Kg/km	118,7
Inorganic materials	M-121	Copper wires	Kg/km	328,4
Organic materials	M-322	Rubber filling	Kg/km	785,7
Organic materials	M-201	High-Density Polyethylene (LSF)	Kg/km	284,1
Total weight			Kg/km	2.244,0

The total weight of the wood used for packaging (wooden drum) per 1 km is 374 kg.

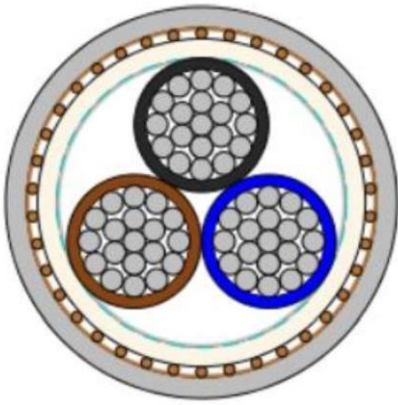


Figure 1 Cable manufacturing layers

Manufacturing stage includes all the processes presented below:

1. Aluminium conductor
2. Cross-linked polyethylene
3. Rubber filling
4. Copper wire (screen)
5. High-Density polyethylene jacket

For the second cable, the production includes utilization of aluminum ingots, used for the production of the cable conductor (melting primary aluminum to form a solid aluminum rod, which will then undergo a wire drawing process, reducing the rods diameter to the designed cross-sections). The conductors will be then electrically insulated with a cross-linked polyethylene compound. Table 4 presents the main technical specifications and table 5 the bill of materials.

Underground cable ARE4H5EX 12/20 (24) kV 3X185 RM stranded

Table 4 Technical specifications of the cable

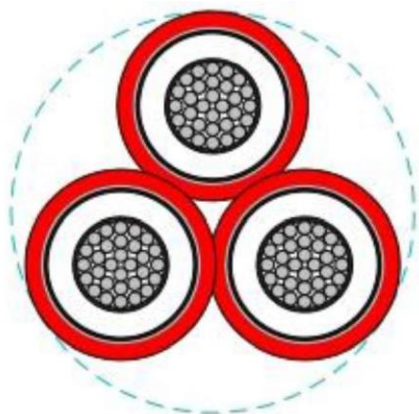
General Description	
Standard specification:	GSC001, REV.05 2018
Type of cable:	ARE4H5EX
Rated voltage U ₀ /U (U _{max}):	12/20 (24) kV
Number of cores x Nominal cross-section:	3x185 mm ²
Approximate cable overall diameter:	71.52 mm
Approximate cable overall weight:	3.483 kg/m
Nominal drum length (Tolerance):	300 m (± 1%)

Table 5 Cable bill of materials according to IEC 62474

Material class	Material category	Raw materials	Units	Amount
Inorganic materials	M-120	Aluminium Conductor	Kg/km	1.412,4
Organic materials	M-251	Cross-Linked Polyethylene	Kg/km	1.116,7
Inorganic materials	M-120	Aluminium + Polyethylene tape	Kg/km	264,2
Organic materials	M-201	High-Density Polyethylene	Kg/km	654,3
Total weight			Kg/km	3.447,6

The total weight of the wood used for packaging (wooden drum) per 1 km is 2.050 kg.

Figure 2 Cable manufacturing layers



Manufacturing stage includes all the processes presented below:

1. Aluminium conductor
2. Cross-linked polyethylene
3. Aluminium and polyethylene tape
4. High-Density polyethylene jacket

Both products do not contain any hazardous substances, specifically identified as substances of very high concern, according to REACH regulation.

Description of modules included

The production starts with the material supply. This stage includes the mining and processing of raw materials. The company is part of a global supply chain, with suppliers and raw materials scattered across different continents. Main materials used in the production are the aluminium ingots used for the production of the cable conductor, cross-linked polyethylene for insulation purposes and high-density polyethylene used for outer jacket. Primary materials arrive to the company's gate mostly via trucks and container ships. During manufacturing, the company is using diesel oil (for inhouse transportation). In addition, manufacturing stage includes the treatment of generated waste, which considers plastics and metals recycling/landfilling. The manufactured product will be transported to Italy, to the storage facility.

For the use stage of the product, an amount of electrical energy will be dissipated to the environment, as a result of the conductor's electrical losses from the resistivity of aluminium. To calculate the respective losses

over the cable’s life cycle, the following assumptions were used:

ARE4*OCE 0.6/1 (1.2) kV 3X95 RM stranded

- Current: 1 A
- Resistivity of aluminium conductor: 0,960 (IEC 60228)
- Reference Service Life: 40 years and 100% use rate (seconds)

ARE4H5EX 12/20 (24) kV 3X185 RM stranded Triplex

- Current: 1 A
- Resistivity of aluminium conductor: 0,492 (IEC 60228)
- Reference Service Life: 40 years and 100% use rate (seconds)

Losses are calculated as: $I^2 \cdot R \cdot RSL$ (in Joules)

After deinstallation of the cables (excluded in this study), dismantled cable components will be transported to the recycling facility to reclaim recyclable parts, where plastics will be driven to energy recovery, via mechanical separation. Therefore, no disposal will take place with regards to stripped cable components.

Impact Assessment

Results per functional unit of the cables included in this study are presented below. (EN 15804:2012+A2:2019, EF 3.1)

ARE4*OCE 0.6/1 (1.2) kV 3X95 RM stranded

INDICATOR	UNIT	TOTAL	Manufacturing		Distribution	Use	End of Life
			UPSTREAM	CORE	DOWNSTREAM		
GWP-total	kg CO2eq	2,19E+04	1,66E+04	6,27E+02	6,33E+02	1,24E+02	3,91E+03
GWP-fossil	kg CO2eq	2,19E+04	1,66E+04	1,28E+03	6,39E+02	1,22E+02	3,26E+03
GWP-biogenic	kg CO2eq	-1,30E+01	6,84E+00	-6,58E+02	-1,61E+01	1,68E+00	6,53E+02
GWP-luluc	kg CO2eq	2,54E+01	1,09E+01	3,30E+00	1,05E+01	1,79E-02	5,83E-01
ODP	kg CFC-11eq	6,88E-08	5,07E-08	1,35E-08	9,24E-11	2,99E-09	1,44E-09
POCP	kg NMVOC eq	5,55E+01	4,65E+01	3,75E+00	4,36E+00	1,28E-01	7,74E-01
AP	mol H+eq	1,07E+02	9,72E+01	4,75E+00	4,49E+00	2,11E-01	8,70E-01
EP-freshw	kg P eq	2,07E-02	8,39E-03	8,59E-03	2,68E-03	7,06E-04	3,42E-04
WDP	m3 depriv.	4,54E+03	3,77E+03	4,02E+02	9,71E+00	5,61E+01	3,06E+02
ADP-fossil	MJ	2,27E+05	1,96E+05	1,63E+04	8,26E+03	1,79E+03	5,38E+03
ADP-min&met	kg Sb eq	1,34E+00	1,34E+00	1,45E-04	5,46E-05	2,17E-05	2,52E-05

GWP-total = Global Warming Potential; GWP-fossil = Global Warming Potential - fossil; 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; 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 deprivation potential, deprivation weighted water consumption. The results of these environmental impact indicators (ODP, WDP) should be used with caution as uncertainties are high or experience with the indicator is limited.

INDICATOR	UNIT	TOTAL	Manufacturing		Distribution	Use	End of Life
			UPSTREAM	CORE	DOWNSTREAM		
PENRE	MJ	2,07E+05	1,76E+05	1,63E+04	8,26E+03	1,79E+03	5,38E+03

PERE	MJ	6,51E+04	4,56E+04	1,62E+04	7,11E+02	1,85E+03	7,69E+02
PENRM	MJ	2,00E+04	2,00E+04	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	2,27E+05	1,96E+05	1,63E+04	8,26E+03	1,79E+03	5,38E+03
PERT	MJ	6,51E+04	4,56E+04	1,62E+04	7,11E+02	1,85E+03	7,69E+02
FW	m3	1,20E+02	1,03E+02	7,77E+00	7,93E-01	1,46E+00	7,15E+00
MS	kg	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
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PENRM = Use of nonrenewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; PERT = Total use of renewable primary energy resources; FW = Use of net fresh water; MS = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels.

INDICATOR	UNIT	Manufacturing			Distribution	Use	End of Life
		TOTAL	UPSTREAM	CORE	DOWNSTREAM		
HWD	kg	2,38E-04	2,21E-04	1,15E-05	3,26E-07	3,83E-06	1,84E-06
NHWD	kg	4,70E+03	4,17E+03	2,47E+02	1,39E+00	4,82E+00	2,80E+02
RWD	kg	4,15E+00	2,86E+00	1,06E+00	1,55E-02	1,64E-01	5,57E-02
MER	kg	1,23E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,23E+03
MFR	kg	1,10E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,10E+03
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; MER = Materials for energy recovery; MFR = Materials for recycling; CRU = Components for reuse; ETE= Exported thermal energy; EEE= Exported electricity energy.

ARE4H5EX 12/20 (24) kV 3X185 RM stranded Triplex

INDICATOR	UNIT	Manufacturing			Distribution	Use	End of Life
		TOTAL	UPSTREAM	CORE	DOWNSTREAM		
GWP-total*	kg CO2eq	4,65E+04	3,81E+04	-1,41E+03	1,28E+03	6,34E+01	8,47E+03
GWP-fossil	kg CO2eq	4,65E+04	3,80E+04	2,17E+03	1,29E+03	6,25E+01	4,89E+03
GWP-biogenic	kg CO2eq	3,63E+01	7,84E+01	-3,59E+03	-3,26E+01	8,59E-01	3,58E+03
GWP-luluc	kg CO2eq	3,91E+01	8,17E+00	8,69E+00	2,13E+01	9,20E-03	8,82E-01
ODP	kg CFC-11eq	1,46E-07	1,24E-07	1,79E-08	1,87E-10	1,53E-09	1,82E-09
POCP	kg NMVOC eq	1,18E+02	9,97E+01	8,53E+00	8,82E+00	6,55E-02	1,04E+00
AP	mol H+eq	1,82E+02	1,62E+02	9,56E+00	9,08E+00	1,08E-01	1,18E+00
EP-freshw	kg P eq	7,45E-02	4,42E-02	2,40E-02	5,41E-03	3,62E-04	4,85E-04
WDP	m3 depriv.	7,13E+03	6,00E+03	6,17E+02	1,96E+01	2,88E+01	4,60E+02
ADP-fossil	MJ	5,55E+05	4,98E+05	3,33E+04	1,67E+04	9,16E+02	6,44E+03
ADP-min&met	kg Sb eq	2,14E-03	1,71E-03	2,83E-04	1,10E-04	1,11E-05	3,07E-05

GWP-total = Global Warming Potential; GWP-fossil = Global Warming Potential - fossil; 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; 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 deprivation potential, deprivation weighted water consumption.

The results of these environmental impact indicators (ODP, WDP) should be used with caution as uncertainties are high or experience with the indicator is limited.

*GWP-total manufacturing value is negative due to biogenic emissions from wooden packaging

INDICATOR	UNIT	TOTAL	Manufacturing		Distribution	Use	End of Life
			UPSTREAM	CORE	DOWNSTREAM		
PENRE	MJ	4,66E+05	4,09E+05	3,33E+04	1,67E+04	9,16E+02	6,44E+03
PERE	MJ	1,60E+05	9,60E+04	6,07E+04	1,44E+03	9,47E+02	9,90E+02
PENRM	MJ	8,88E+04	8,88E+04	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	5,55E+05	4,98E+05	3,33E+04	1,67E+04	9,16E+02	6,44E+03
PERT	MJ	1,60E+05	9,60E+04	6,07E+04	1,44E+03	9,47E+02	9,90E+02
FW	m3	2,20E+02	1,92E+02	1,55E+01	1,60E+00	7,50E-01	1,08E+01
MS	kg	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
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PENRM = Use of nonrenewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; PERT = Total use of renewable primary energy resources; FW = Use of net fresh water; MS = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels.

INDICATOR	UNIT	TOTAL	Manufacturing		Distribution	Use	End of Life
			UPSTREAM	CORE	DOWNSTREAM		
HWD	kg	2,42E-04	2,16E-04	2,44E-05	6,40E-07	8,42E-07	0,00E+00
NHWD	kg	8,21E+03	7,83E+03	3,80E+02	2,73E+00	1,06E+00	0,00E+00
RWD	kg	7,73E+00	6,44E+00	1,22E+00	3,04E-02	3,61E-02	2,16E-04
MER	kg	6,44E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,44E+00
MFR	kg	7,83E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,83E+03
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; MER = Materials for energy recovery; MFR = Materials for recycling; CRU = Components for reuse; ETE= Exported thermal energy; EEE= Exported electricity energy.

METHODOLOGY

The methodology followed as a reference standard is that of the Life Cycle Assessment, which considers all environmental aspects and potential environmental impacts along the life cycle of the product, from the extraction and transport of raw materials through manufacture and use, up to at the end of life.

DECLARED UNIT

1 km of cable for all the life cycle stages besides use phase

The impacts from these things are not considered in the present study:

EXCLUSIONS AND CUT OFF

- electricity consumption for office;
- production, transport and installation of capital goods (buildings, infrastructures, machinery);

- materials and

energy flows of the installation and deinstallation stages.

DATA QUALITY

In the context of this study, the activity data are mainly of “primary type”, i.e., collected with the support of the Company for the specific production site.

Generic data refer to LCA for Experts, professional database CUP v.2023.2. The database used is regarded as representative on the basis of a comparative study, which examined the data for a reference product of the EPD Owner.

REFERENCE PERIOD

The primary data collected in the context of this study refer to the year 2023.

ALLOCATION

The allocation criteria adopted for the LCA model comply with the reference standards. Primary data from the production stage have been allocated to the product on the basis of production mass. Mass allocation was used to estimate energy and resources consumption of each product.

STAGES

UPSTREAM CORE

Manufacturing stage:

- Extraction of raw materials and production of final cable products;
- Transport of materials in manufacturing site;
- Manufacturing and assembling of the product;
- Waste disposal and recycling.

DOWNSTREAM

Distribution stage: transport of the finished product to the final customer.

Use and maintenance stage: the electrical energy losses of the cables encountered during operation, for the whole duration of their life cycle (40 years).

End of life stage: the transport of the product to the treatment site and the final disposal of the product.

The disposal scenario of both cables under the present EPD consider stripping, plastics incineration and metals recycling.

Reference

Service Life (RSL)

In this LCA study, functional to obtaining the EPD certification, a useful life was considered 40 years and 100% use rate, in accordance with the provisions of the reference PCR.

REFERENCES:

- General Programme Instructions of the EPDItaly, Version 6.0
- EPDItaly007-CORE-PCR-EN-50693_13012023-rev.3
- EN 15804:2012+A2:2019 Sustainability of construction works - Environmental Product Declarations, Core rules for the product category of construction products
- EN 50693:2019 Product category rules for life cycle assessments of electronic and electrical products and systems
- ISO 14020:2000 Environmental labels and declarations, General principles
- ISO 14025:2006 Environmental labels and declarations - Type III environmental declarations— Principles and procedures
- ISO 14040:2006 Environmental management - Life cycle assessment-Principles and framework
- ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines
- EPDItaly016-SUB-PCR-EN-50693_cables_v2