ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Medium Voltage Distribution Cable (1C x 630 SQMM)

APAR Industries Limited

Created with One Click LCA

EPD HUB, HUB-4649

Published on 11.12.2025, last updated on 11.12.2025, valid until 10.12.2030

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1

GENERAL INFORMATION

MANUFACTURER

Manufacturer	APAR Industries Limited
Address	City Survey No. NA 1990, Village: Khatalwada & Revenue Survey No. 730 & 730/P1, Village: Manekpur, Khatalwada-Manekpur Road, Taluka: Umbergaon, District: Valsad, Gujarat - 396120, INDIA
Contact details	epd.info@apar.com
Website	www.apar.com

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Electrical Product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with modules B6, C1-C4, D
EPD author	Mr. Rahul Bhandari & Mr. Balvant Singh
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of electrical products may not be comparable if they do not comply with EN 15804+A2 and if they are not compared in a building context.

PRODUCT

Product name	Medium Voltage Distribution Cable (1C x 630 SQMM)
Product reference	RG7H1E, 12/20 (24) kV, 1C X 630 SQMM
Place(s) of raw material origin	South Korea, Italy and India
Place of production	Khatalwada, Gujrat, India
Place of Installation and Use	Europe
Period for data	January 2024 to December 2024
Averaging in EPD	No grouping
Variation in GWP-fossil for A1-A3 (%)	-
A1-A3 Specific data (%)	9.21

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m of Single Phase Medium Voltage Cable
Declared unit mass	7.59 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	65.4
GWP-total, A1-A3 ($kgCO_2e$)	64.1
Secondary material, inputs (%)	16.3
Secondary material, outputs (%)	52.6
Total energy use, A1-A3 (kWh)	283
Net freshwater use, A1-A3 (m^3)	1.85

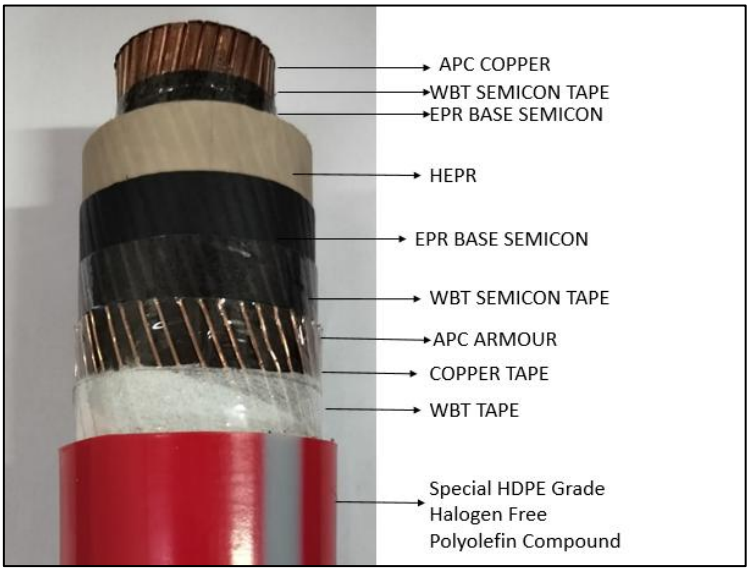
PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

APAR Industries Limited is an Indian multinational conglomerate founded in 1958. The Company is global leader in Specialty Oils, Conductors, Cables, Lubricants, Specialty Automotive, and Polymers, with a presence in more than 140 countries. For more than six decades, APAR has been driving innovation with strong in-house R&D and state-of-the-art manufacturing, including advanced electron beam (e-beam) curing technology that ensures superior performance and reliability of its cables. Renowned for pioneering elastomer cables in India and being one of the largest manufacturers of solar cables, APAR delivers to diverse sectors such as renewable energy, defence, railways, shipbuilding, and power infrastructure, maintaining a consistent focus on quality, sustainability, and customer-centric solutions. The company is ranked #1 globally in Aluminium and Alloy Conductors, #1 in India and #3 globally in Transformer Oils, and is India's largest exporter and producer of speciality and renewable cables. It is also the only Indian company providing end-to-end solutions in copper and fiber hybrid cables, and features in the Top 10 lubricants companies in India. Its consistent focus on quality, sustainability, and customer-centric solutions has cemented its position as an indispensable partner in powering industries and communities worldwide.

PRODUCT DESCRIPTION

The single phase Medium Voltage Distribution Cable is designed for distribution of electrical energy in medium voltage networks up to 12/20 (24) kV with a cross-sectional area of 630 sqmm. It is manufactured with a high-conductivity, stranded and compacted plain annealed copper conductor, ensuring excellent electrical performance and reliability under continuous service conditions.



Feature:

- Superior dielectric strength and thermal stability.
- Improved strength to weight ratio.
- Watertight design prevents moisture ingress and enhances operational reliability
- Long service life and operational safety

Further information can be found at www.apar.com.

DATA SHEET

S. No.	Particular	Unit	Data
1	Specification according to which the conductor will be manufactured and tested.	-	IEC : 60502-2 & GSCC023 Rev. 00
2	Code Name	-	630 SQMM – 12 / 20 (24) kV
3	No. of wire and Diameter	No	91/3.05 mm
4	D. C. RESISTANCE AT 20°C (At Final Stage)	Ohm / m	0.0000275
5	Nominal Mass of Conductor	Kg / m	7.59

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	77.54%	India
Minerals	-	-
Fossil materials	22.46%	South Korea, Italy ,India
Bio-based materials	-	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0.5

FUNCTIONAL UNIT AND SERVICE LIFE

Declared Unit	1 m of Single Phase Medium Voltage Cable
Mass per declared unit	7.59 kg
Functional unit	Single-phase medium-voltage electrical capacity of 1 A at 12/20 (24) kV through 1 m of covered conductor cable (630 SQ.MM.)
Reference service life	25 years

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0.1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD considers the entire life cycle of the cable manufactured by APAR Industries. The EPD type is therefore “from cradle to gate with module B6, C1-C4 and D” type. In accordance with the EPD Regulations

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	MND	MND	MND	MND	MND	MND	MND	x	MND	x	x	x	x		x	
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered in the product stage include the extraction and manufacturing of raw materials, packaging, ancillary materials, fuels used by production machinery, and the handling of production waste at the manufacturing facilities. Losses occurring during manufacturing as well as electricity transmission losses are also accounted for. A market-based approach is used to model the electricity mix consumed at the factory.

The cable production process begins with the sourcing of essential materials: copper as the conductor, and insulation and sheath compounds. These materials are transported to APAR’s production facility via sea and road. Copper undergoes the initial processing phase of wire drawing, reducing it to the precise diameter needed for the conductor. The drawn copper is then stranded and compacted to provide the necessary electrical performance and mechanical flexibility.

In parallel, insulation and sheath compounds are prepared and extruded onto the conductor. These materials are selected to strictly meet electrical, mechanical, and environmental requirements. To ensure traceability, the outer sheath is printed with identification details per relevant standards.

Electricity powers the various production lines, while auxiliary materials support the smooth operation of the equipment. Once complete, the cables are wound onto pinewood drums that provide protection during storage, transport, and handling. These drums are robust enough to support safe installation at the customer’s site.

The facility demonstrates its commitment to sustainability through the use of certified green electricity (Energy supply agreement), which applies throughout the validity period of this EPD.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts (A4) account for fuel combustion emissions, the environmental impact of fuel production, and associated infrastructure burdens. After packaging, the cables are inspected, labelled, and documented before dispatch. They are loaded securely onto trucks or containers, with tracking systems ensuring safe and timely delivery to customers.

For installation (A5), the product is delivered to the construction site, unloaded, and prepared for deployment. Safety protocols guide handling, while packaging materials (primarily wooden drums) are collected for reuse, recycling, or disposal.

This EPD does not provide detailed modelling of A4 and A5 as transport routes, installation practices, and site-specific conditions are outside the manufacturer’s control.

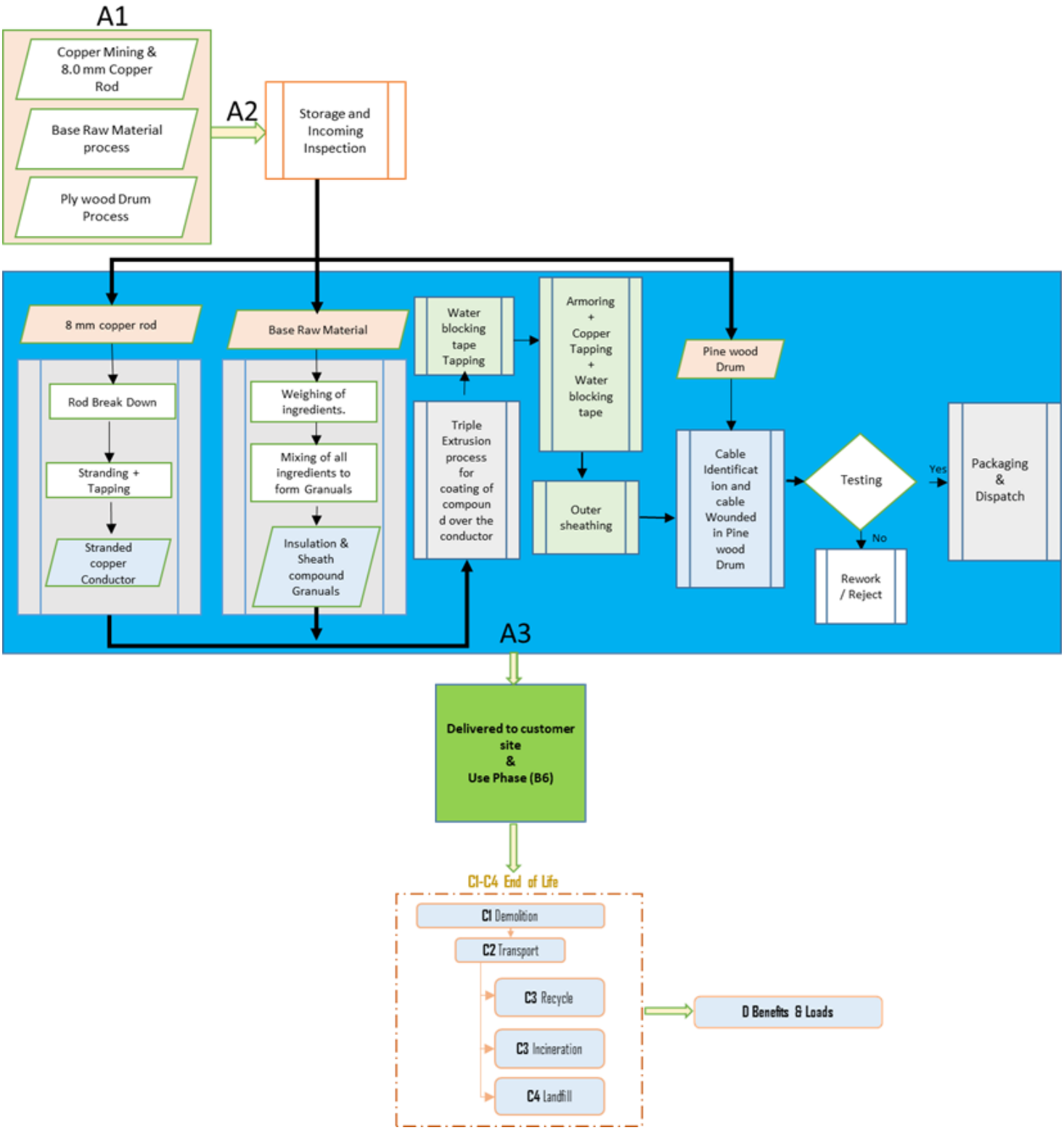
PRODUCT USE AND MAINTENANCE (B1-B7)

The cable is intended for medium-voltage power distribution in utility grids and industrial installations. It is typically a single-installation product, designed for reference service life of 25 years.
For operational energy use (B6), No additional energy is consumed by the product itself during use, apart from the electricity it transmits as part of its intended function. In this phase we have considered the loss of electricity due to its resistance during its service life.

PRODUCT END OF LIFE (C1-C4, D)

At end-of-life, cables are dismantled with negligible energy consumption. We have assumed that the waste is collected separately and transported to the waste treatment center. Transportation distance to treatment is assumed as 50-250 km as per the European scenario and the transportation method is assumed to be lorry (C2). As per common practice, the cable is shredded and the metals, Insulation and Sheath material from the product is sorted. Module C3 accounts for energy and resource inputs for sorting and treating these waste streams, 60 % recyclable & reusable and 40% landfill for copper waste as per the Europe scenario, while for Rubber compound 50% of rubber waste is incinerated with energy recovery, 25% of rubber waste is incinerated without energy recovery and 25% of rubber waste is landfilled. For Packaging the wooden drum is used for which 32% of the wooden packaging is recycled, 30% of the wooden packaging is incinerated and 38% of the wooden packaging is landfilled (source: EUROSTAT). Due to the material and energy recovery potential of the materials, a part of the end-of-life product is converted into recycled raw materials while electric and heat energy are generated from incineration.

SYSTEM BOUNDARY



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 2 and 3. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	Mass allocation
Packaging material	Mass allocation
Ancillary materials	Mass allocation
Manufacturing energy and waste	Mass allocation

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	No grouping
Grouping method	Not applicable
Variation in GWP-fossil for A1-A3, %	-

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent v3.10.1 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	5.94E+01	1.46E+00	3.21E+00	6.41E+01	MND	MND	MND	MND	MND	MND	MND	5.52E-02	MND	0.00E+00	2.43E-01	3.88E+00	1.67E+00	-2.10E+01
GWP – fossil	kg CO_2e	5.90E+01	1.45E+00	5.00E+00	6.54E+01	MND	MND	MND	MND	MND	MND	MND	5.50E-02	MND	0.00E+00	2.43E-01	2.76E+00	9.90E-01	-2.10E+01
GWP – biogenic	kg CO_2e	3.56E-01	3.20E-04	-1.79E+00	-1.44E+00	MND	MND	MND	MND	MND	MND	MND	1.91E-05	MND	0.00E+00	5.09E-05	1.11E+00	6.82E-01	6.88E-02
GWP – LULUC	kg CO_2e	1.09E-01	6.51E-04	2.56E-03	1.12E-01	MND	MND	MND	MND	MND	MND	MND	1.20E-04	MND	0.00E+00	1.07E-04	1.89E-04	2.17E-05	-3.24E-02
Ozone depletion pot.	kg $CFC\text{-}_{11}$e	2.54E-06	2.15E-08	2.91E-08	2.59E-06	MND	MND	MND	MND	MND	MND	MND	1.07E-10	MND	0.00E+00	3.47E-09	1.99E-09	9.34E-10	-1.98E-07
Acidification potential	mol H^+e	4.69E+00	5.13E-03	2.69E-02	4.72E+00	MND	MND	MND	MND	MND	MND	MND	2.55E-04	MND	0.00E+00	8.09E-04	1.58E-03	3.16E-04	-5.85E-01
EP-freshwater[2)]	kg Pe	2.39E-01	1.13E-04	1.67E-03	2.41E-01	MND	MND	MND	MND	MND	MND	MND	5.42E-05	MND	0.00E+00	1.88E-05	6.62E-05	8.20E-06	-4.18E-01
EP-marine	kg Ne	1.84E-01	1.67E-03	4.14E-03	1.89E-01	MND	MND	MND	MND	MND	MND	MND	5.76E-05	MND	0.00E+00	2.63E-04	4.69E-04	9.19E-04	-1.69E-01
EP-terrestrial	mol Ne	2.53E+00	1.82E-02	4.19E-02	2.59E+00	MND	MND	MND	MND	MND	MND	MND	5.37E-04	MND	0.00E+00	2.86E-03	4.97E-03	1.33E-03	-2.48E+00
POCP ("smog")[3)]	kg NMVOCe	8.02E-01	7.42E-03	1.30E-02	8.22E-01	MND	MND	MND	MND	MND	MND	MND	1.42E-04	MND	0.00E+00	1.13E-03	1.39E-03	4.27E-04	-4.81E-01
ADP-minerals & metals[4)]	kg Sbe	6.56E-02	4.05E-06	4.40E-06	6.56E-02	MND	MND	MND	MND	MND	MND	MND	2.88E-08	MND	0.00E+00	7.94E-07	5.93E-06	1.10E-07	-7.68E-03
ADP-fossil resources	MJ	7.97E+02	2.11E+01	5.85E+01	8.76E+02	MND	MND	MND	MND	MND	MND	MND	6.24E-01	MND	0.00E+00	3.41E+00	1.80E+00	7.03E-01	-2.49E+02
Water use[5)]	m^3e depr.	5.05E+01	1.04E-01	2.73E+01	7.80E+01	MND	MND	MND	MND	MND	MND	MND	1.22E-02	MND	0.00E+00	1.59E-02	1.50E-01	5.16E-02	-8.26E+00

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	9.75E-06	1.45E-07	1.05E-07	1.00E-05	MND	MND	MND	MND	MND	MND	MND	9.38E-10	MND	0.00E+00	1.95E-08	1.89E-08	4.73E-09	-4.79E-06
Ionizing radiation[6)]	kBq U235e	5.76E+00	1.83E-02	6.51E-02	5.84E+00	MND	MND	MND	MND	MND	MND	MND	2.06E-03	MND	0.00E+00	2.84E-03	6.30E-03	7.25E-04	-1.65E+00
Ecotoxicity (freshwater)	CTUe	2.96E+04	2.98E+00	2.26E+01	2.96E+04	MND	MND	MND	MND	MND	MND	MND	1.34E-01	MND	0.00E+00	5.34E-01	4.09E+00	2.73E+00	-5.00E+03
Human toxicity, cancer	CTUh	5.44E-07	2.40E-10	2.88E-09	5.47E-07	MND	MND	MND	MND	MND	MND	MND	9.85E-12	MND	0.00E+00	4.13E-11	1.56E-10	2.48E-11	-1.11E-08
Human tox. non-cancer	CTUh	5.57E-05	1.36E-08	3.23E-08	5.57E-05	MND	MND	MND	MND	MND	MND	MND	5.61E-10	MND	0.00E+00	2.14E-09	7.90E-09	1.49E-09	-6.28E-07
SQP[7)]	-	1.51E+03	2.12E+01	2.32E+02	1.76E+03	MND	MND	MND	MND	MND	MND	MND	1.29E-01	MND	0.00E+00	2.09E+00	2.54E+00	1.25E+00	-4.45E+02

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	1.77E+02	2.89E-01	2.04E+01	1.98E+02	MND	MND	MND	MND	MND	MND	MND	5.18E-02	MND	0.00E+00	4.73E-02	-8.60E+00	-6.93E+00	-1.09E+02
Renew. PER as material	MJ	0.00E+00	0.00E+00	1.62E+01	1.62E+01	MND	MND	MND	MND	MND	MND	MND	0.00E+00	MND	0.00E+00	0.00E+00	-1.00E+01	-6.14E+00	9.03E-01
Total use of renew. PER	MJ	1.77E+02	2.89E-01	3.66E+01	2.14E+02	MND	MND	MND	MND	MND	MND	MND	5.18E-02	MND	0.00E+00	4.73E-02	-1.86E+01	-1.31E+01	-1.08E+02
Non-re. PER as energy	MJ	7.41E+02	2.11E+01	5.74E+01	8.20E+02	MND	MND	MND	MND	MND	MND	MND	6.24E-01	MND	0.00E+00	3.41E+00	-3.00E+01	-2.42E+01	-2.49E+02
Non-re. PER as material	MJ	5.27E+01	0.00E+00	5.69E-01	5.32E+01	MND	MND	MND	MND	MND	MND	MND	0.00E+00	MND	0.00E+00	0.00E+00	-3.94E+01	-1.39E+01	5.39E+00
Total use of non-re. PER	MJ	7.94E+02	2.11E+01	5.80E+01	8.73E+02	MND	MND	MND	MND	MND	MND	MND	6.24E-01	MND	0.00E+00	3.41E+00	-6.94E+01	-3.81E+01	-2.44E+02
Secondary materials	kg	1.24E+00	8.98E-03	5.28E-02	1.30E+00	MND	MND	MND	MND	MND	MND	MND	3.88E-05	MND	0.00E+00	1.53E-03	2.35E-03	3.08E-04	2.41E+00
Renew. secondary fuels	MJ	4.75E-02	1.14E-04	4.27E-01	4.74E-01	MND	MND	MND	MND	MND	MND	MND	3.29E-07	MND	0.00E+00	1.95E-05	7.44E-05	7.87E-06	-1.22E-02
Non-ren. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	1.79E+00	3.11E-03	5.58E-02	1.85E+00	MND	MND	MND	MND	MND	MND	MND	2.86E-04	MND	0.00E+00	4.54E-04	2.61E-03	-1.87E-03	-3.42E-01

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	2.19E+01	3.57E-02	1.12E-01	2.21E+01	MND	MND	MND	MND	MND	MND	MND	2.92E-03	MND	0.00E+00	5.90E-03	5.86E-02	2.04E-02	-4.23E+00
Non-hazardous waste	kg	1.63E+03	6.60E-01	5.46E+00	1.63E+03	MND	MND	MND	MND	MND	MND	MND	2.60E-01	MND	0.00E+00	1.11E-01	1.58E+00	4.57E+00	7.52E-01
Radioactive waste	kg	1.62E-03	4.49E-06	1.17E-05	1.64E-03	MND	MND	MND	MND	MND	MND	MND	6.39E-07	MND	0.00E+00	6.96E-07	1.56E-06	1.80E-07	-4.07E-04

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	5.22E-02	5.22E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	MND	0.00E+00	0.00E+00	3.99E+00	0.00E+00	0.00E+00
Materials for energy rec	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	MND	0.00E+00	0.00E+00	1.18E+01	0.00E+00	0.00E+00
Exported energy – Electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	MND	0.00E+00	0.00E+00	4.98E+00	0.00E+00	0.00E+00
Exported energy –	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	MND	0.00E+00	0.00E+00	6.83E+00	0.00E+00	0.00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	5.90E+01	1.45E+00	4.98E+00	6.54E+01	MND	MND	MND	MND	MND	MND	MND	5.51E-02	MND	0.00E+00	2.42E-01	2.76E+00	1.01E+00	-2.10E+01
Ozone depletion Pot.	kg CFC_{-11}e	1.80E-06	1.71E-08	2.54E-08	1.84E-06	MND	MND	MND	MND	MND	MND	MND	1.02E-10	MND	0.00E+00	2.77E-09	1.70E-09	7.76E-10	-1.67E-07
Acidification	kg SO_2e	4.16E+00	3.93E-03	2.28E-02	4.18E+00	MND	MND	MND	MND	MND	MND	MND	2.10E-04	MND	0.00E+00	6.19E-04	1.23E-03	2.33E-04	-3.97E-01
Eutrophication	kg PO_4^3e	1.91E-01	9.36E-04	1.55E-02	2.07E-01	MND	MND	MND	MND	MND	MND	MND	3.56E-05	MND	0.00E+00	1.51E-04	2.33E-04	1.09E-04	-1.47E-01
POCP (“smog”)	kg C_2H_4e	1.72E-01	3.44E-04	1.15E-03	1.74E-01	MND	MND	MND	MND	MND	MND	MND	1.14E-05	MND	0.00E+00	5.56E-05	7.70E-05	2.97E-05	-1.91E-02
ADP-elements	kg Sbe	6.55E-02	3.95E-06	4.31E-06	6.55E-02	MND	MND	MND	MND	MND	MND	MND	2.86E-08	MND	0.00E+00	7.75E-07	5.86E-06	8.66E-08	-7.66E-03
ADP-fossil	MJ	7.04E+02	2.08E+01	5.82E+01	7.83E+02	MND	MND	MND	MND	MND	MND	MND	6.00E-01	MND	0.00E+00	3.37E+00	1.70E+00	6.92E-01	-2.22E+02

ADDITIONAL INDICATOR – GWP-GHG

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	5.91E+01	1.46E+00	5.00E+00	6.55E+01	MND	MND	MND	MND	MND	MND	MND	5.52E-02	MND	0.00E+00	2.43E-01	2.76E+00	9.90E-01	-2.11E+01

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH4 fossil, CH4 biogenic and Dinitrogen monoxide – were updated. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO2 is set to zero.

MODEL SCENARIOS

MANUFACTURING ENERGY SCENARIO

The manufacturing facility sources its electricity from a combination of on-site renewable generation and the Indian national grid. Approximately 2.65% of the total electricity consumption is supplied by a rooftop solar photovoltaic (PV) system. The remaining 97.35% of electricity is purchased from the Indian grid, which itself has a significant renewable energy share, comprising 6.7% solar power and 20.3% wind power, with the balance supplied by coal, hydro, nuclear, and other sources.

For modelling purposes, the following datasets from Ecoinvent v3.10.1 have been applied:

- Electricity, consumption mix w/o renewables, IN → emission factor 1.15 kg CO_2e/kWh
- Electricity production, photovoltaic, rooftop, IN → emission factor 0.0589 kg CO_2e/kWh
- Electricity production, wind, onshore, IN → emission factor 0.0211 kg CO_2e/kWh
- Heat Production, natural gas, IN → emission factor 0.0804 kg CO_2e/MJ.

This blended energy profile reflects both the company's direct investment in renewable generation and India's ongoing energy transition, modelled using a market-based approach in line with EN 15804 and OneClick LCA best practices. In addition, PNG is consumed to generate steam for the curing process**,** which is a critical step in cable manufacturing.

USE STAGES SCENARIO

The use phase accounts for the environmental impacts associated with the electricity losses occurring during cable operation. These losses are generated as heat due to the electrical resistance of the conductor and are directly proportional to the square of the transmitted current. The dissipated energy is calculated according to the following formula:

$$P = \sqrt{3} \times V \times I \times \cos\Phi$$

Where:

P = Power loss through dissipation
I = Current transferred in Ampere
V = Voltage drop V/A/km
RSL = Reference Service Life of cable

For the analyzed product (Medium Voltage Distribution Cable 1C X 630 SQMM), the parameters considered in the use stage scenario are:

Parameter	Unit	Value
Current value (I)	A	1
Voltage Drop	V / A/ m	0.00014
Reference Service Life (RSL)	Years	25

For electricity modelling during the use phase, Electricity, medium voltage, market mix, IN with emission factor 1.3 kg CO_2e/kWh from the Ecoinvent v3.10.1 database has been applied. This ensures that the environmental impacts of energy generation are consistent with regional conditions.

END OF LIFE SCENARIO

At the end of life, it is assumed that 100% of the installed cable is recovered and sent for appropriate treatment. Transportation of the dismantled cables to the waste treatment facility is considered, with

an assumed distance of 50–250 km by lorry, the recovered cable undergoes pre-treatment through shredding and granulation, allowing the separation of metallic and non-metallic fractions. For the metallic fraction, 60% of the copper is assumed to be recyclable and reusable, while the remaining 40% is sent to landfill. For the polymeric components, such as insulation and sheath compounds, 50% of the rubber waste is incinerated with energy recovery, 25% is incinerated without energy recovery, and 25% is landfilled. The wooden packaging drums are treated according to European waste statistics, with 32% recycled, 30% incinerated, and 38% landfilled. This end-of-life scenario reflects the material recovery and energy recovery potential of cable components, ensuring that part of the disposed material is converted back into secondary raw materials, while additional electricity and heat are generated from incineration processes, thus contributing to resource efficiency and circularity.

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR 1.2 and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR 1.2 and EN 15802+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

HaiHa Nguyen, as an authorized verifier acting for
EPD Hub Limited

11.12.2025